National Emission Standards for Hazardous Air Pollutants from the Pulp and Paper Industry (40 CFR Part 63, Subpart S) Residual Risk and Technology Review, Final Amendments

Response to Public Comments on December 27, 2011 Proposal

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List of Acronyms and Units of Measure

AAL	Acceptable Ambient Level
ACC	American Chemistry Council
Act	Clean Air Act
ADTBP	Air-Dried Ton of Bleached Pulp
ADTUBP	Air-Dried Ton of Unbleached Pulp
AEGL	Acute Exposure Guideline Level
AERMOD	AMS and EPA's AERMIC Model
AF&PA	American Forest & Paper Association
AFS	EPA's Air Facility System
AIRS	EPA's Aerometric Information Retrieval System
AMOS	Ample Margin of Safety
AOX	Adsorbable Organic Halides
APPCO	Alabama Pulp & Paper Council
ASB	Aerated Stabilization Basin
AST	Activated Sludge Treatment
BACT	Best Available Control Technology
BART	Best Available Retrofit Technology
BAT	Best Available Technology Economically Achievable
BBDR	Biologically-Based Dose-Response
BID	Background Information Document
BL	Black Liquor
BLO	Black Liquor Oxidation
BMS	Burner Management System
BOD_5	5-Day Biochemical Oxygen Demand
CAA	Clean Air Act
CalEPA	California Environmental Protection Agency
CCA	Clean Condensate Alternative
CDC	Centers for Disease Control and Prevention
CDX	EPA's Central Data Exchange
CEDRI	EPA's Compliance and Emissions Data Reporting Interface
CEMS	Continuous Emissions Monitoring System
CFD	Computational Fluid Dynamic (Model)
CFR	Code of Federal Regulations
CH_4	Methane
CIIT	Chemical Industry Institute of Technology
Cl_2	Chlorine
ClO_2	Chlorine Dioxide
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2eq	CO_2 Equivalents
Court	United States Court of Appeals for the District of Columbia Circuit
CROMERR	Cross Media Electronic Reporting Rule
CRWI	Coalition for Responsible Waste Incineration
CWA	Clean Water Act

DC	District of Columbia
D.C. Cir.	United States Court of Appeals for the District of Columbia Circuit
dL	Deciliter(s)
DPX	DNA-Protein Cross-Link
EBP	Equivalency by Permit
ECF	Elemental Chlorine Free
ECHO	EPA's Enforcement and Compliance History Online
Eco HAP	HAP of potential concern with respect to the environment
EMS	Environmental Management System
EO	Executive Order
EPA	Environmental Protection Agency
ERPG	DOE's Emergency Removal Program Guidelines
ERT	Electronic Reporting Tool
ESA	Endangered Species Act
EU	Emission Unit, European Union
FAX	Facsimile
$F_{bio,\ methanol}$	Site-Specific Fraction of Methanol Biodegraded
FIP	Federal Implementation Plan
FQPA	Food Quality Protection Act
FR	Federal Register
GHG	Greenhouse Gas
GP	General Provisions
HAD	EPA's Health Assessment Document
HAP	Hazardous Air Pollutant
HCE	Hexachloroethane
HD	High-Density
HEM/HEM3	EPA's Human Exposure Model
HI	Hazard Index
HL	Hodgkin Lymphoma
HON	Hazardous Organic NESHAP
HQ	Hazard Quotient
hr	Hour(s)
HVLC	High Volume Low Concentration
ICAC	Institute of Clean Air Companies
ICR	Information Collection Request
IPPC	European Commission's Integrated Pollution Prevention and Control
IPT	Initial Performance Test
IQA	Information Quality Act
IRIS	EPA's Integrated Risk Information System
LAER	Lowest Achievable Emission Rate
lb	Pound
LD	Low-Density
LEL	Lower Explosive Limit
LEU	Leukemia
LK	Lime Kiln
LOAEL	Lowest Observed Adverse Effect Level

LVHC	Low Volume High Concentration
m	Meter(s)
m^3	Cubic Meter(s)
MACT	Maximum Achievable Control Technology
MACT Code	Code within the NEI used to identify processes included in a source category
MEK	Methyl Ethyl Ketone
mg	Milligram(s)
MIBK	Methyl Isobutyl Ketone
MIR	Maximum Individual Risk
MLVSS	Mixed Liquor Volatile Suspended Solids
MOE	Ontario Ministry of the Environment
MW	Megawatt(s)
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NACAA	National Association of Clean Air Agencies
NAS	National Academy of Sciences
NATA	National-Scale Air Toxics Assessment
NCASI	National Council for Air and Stream Improvement
NCDENR	North Carolina Department of Environment and Natural Resources
NCG	Non-Condensable Gas
NCSAB	North Carolina Science Advisory Board for Toxic Air Pollutants
NEI	National Emissions Inventory
NIOSH	National Institute for Occupational Safety and Health
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NOAEL	No Observed Adverse Effect Level
NO_X	Nitrogen Oxides
NPC	Nasopharyngeal Cancer
NPDES	National Pollutant Discharge Elimination System
NRDC	Natural Resources Defense Council
NSPS	New Source Performance Standards
NSSC	Neutral Sulfite Semichemical
NYC	New York City
NYDEC	New York Department of Environmental Conservation
O2Delig	Oxygen Delignification
OAQPS	EPA's Office of Air Quality Planning and Standards
OCC	Old Corrugated Cardboard
ODP	Oven-Dried Pulp
ODTP	Oven-Dried Ton(s) of Pulp
ODW	EPA's Office of Drinking Water
OECA	EPA's Office of Enforcement and Compliance Assurance
OEHHA	California EPA's Office of Environmental Health Hazard Assessment
OGC	EPA's Office of General Counsel
OHEA	EPA's Office of Health and Environmental Assessment
OMB	Office of Management and Budget
ORP	Oxidation/Reduction Potential
OSWER	EPA's Office of Solid Waste and Emergency Response

PAH	Polycyclic Aromatic Hydrocarbon
PB	Power Boiler
PB-HAP	Persistent and Bioaccumulative HAP
PCA	Packaging Corporation of America
PCB	Polychlorinated Biphenyl
PM	Particulate Matter
POM	Polycyclic Organic Matter
ppbdv	Part(s) per Billion by Volume, Dry Basis
ppm	Part(s) per Million
ppmv	Part(s) per Million by Volume
ppmw	Part(s) per Million by Weight
ppt	Part(s) per Trillion
PRA	Paperwork Reduction Act
PSD	Prevention of Significant Deterioration
PT	Port Townsend
PTPC	Port Townsend Paper Corporation
PV	Pressure/Vacuum
QA	Quality Assurance
QC	Quality Control
R2C	Residual Risk Coalition
RACT	Reasonably Available Control Technology
RATA	Relative Accuracy Test Audit
RBLC	RACT/BACT/LAER Clearinghouse
RCP	Regenerative Cellular Proliferation
REL	CalEPA's Reference Exposure Level, NIOSH's Recommended Exposure Level
RF	Recovery Furnace
RfC	Reference Concentration
RfD	Reference Dose
rpm	Revolutions per Minute
RSD	Relative Standard Deviation
RTR	Residual Risk and Technology Review
S. Ct.	United States Supreme Court
SAB	EPA's Science Advisory Board
SCC	Source Classification Code
SD	Standard Deviation
SDT	Smelt Dissolving Tank
SFR	Steam-to-Feed Ratio
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SOG	Stripper Off-Gas
SSM	Startup, Shutdown, and Malfunction
TCDD	Tetrachlorodibenzo(p)dioxin
TCF	Totally Chlorine Free
TOSHI	Target Organ-Specific Hazard Index
tpy	Ton(s) Per Year

TRIM.FaTE	EPA's Total Risk Integrated Methodology, Environmental Fate, Transport, and Ecological Exposure Module
TRS	Total Reduced Sulfur
TTN	EPA's Technology Transfer Network
UEL	Upper Explosive Limit
URE	Unit Risk Estimate
U.S.	United States
U.S.C.	United States Code
v.	Versus
VOC	Volatile Organic Compound
WWT	Wastewater Treatment
WWTP	Wastewater Treatment Plant
WWTS	Wastewater Treatment System
WWW	Worldwide Web
µg	Microgram(s)

1. Introduction

Section 112(f)(2) of the Clean Air Act (CAA) directs the U.S. Environmental Protection Agency (EPA) to conduct risk assessments on each source category subject to maximum achievable control technology (MACT) standards and determine if additional standards are needed to reduce residual risks within 8 years after promulgation. Section 112(d)(6) of the CAA requires EPA to review and revise the MACT standards, as necessary, taking into account developments in practices, processes, and control technologies at least every 8 years. The national emission standards for hazardous air pollutants (NESHAP) for the pulp and paper industry (40 CFR part 63, subpart S) were promulgated in 1998 and are due for review under sections 112(f)(2) and 112(d)(6).

Subpart S is one of several NESHAP included in a January 2009 schedule suit filed by Sierra Club that asks the D.C. Circuit Court to compel EPA to complete the residual risk and technology review (RTR) assessments required by the CAA. The EPA entered into a consent agreement which specifies a proposal date of December 15, 2011 and a promulgation date of July 31, 2012 for subpart S RTR. In addition, on December 19, 2008, the D.C. Circuit Court vacated the startup, shutdown, and malfunction (SSM) exemption provisions in the General Provisions (GP) for non-opacity [§63.6(f)(1)] and opacity [§63.6(h)(1)] standards.

To address the RTR assessments and SSM exemptions, proposed amendments to subpart S were developed, signed by the EPA Administrator on December 15, 2011, and published in the *Federal Register* on December 27, 2011. A 60-day period ending February 27, 2012 was provided for the public to submit comments on the proposal to EPA. The following sections of this document summarize the public comments received on the proposal and present EPA's responses to those comments:

- Section 2–Risk Assessment
- Section 3–Technology Review
- Section 4–Unregulated Sources
- Section 5–Startup, Shutdown, and Malfunction
- Section 6–Excess Emissions Allowances
- Section 7–Testing and Monitoring
- Section 8–Compliance Date
- Section 9–Regulatory Impacts
- Section 10–Miscellaneous Comments

A total of 27 separate sets of written comments were received on the proposal (in addition to 81 site-specific National Emissions Inventory (NEI) revisions). See www.regulations.gov, docket ID no. EPA-HQ-OAR-2007-0544, for the complete comments. Table 1 below lists the names of the commenters providing written comments, their affiliations, and the document numbers assigned to their comments. For simplicity, only the last four digits (and decimal, if applicable) of the document numbers specific to each commenter are presented in this document (*e.g.*, 0083.1, instead of EPA-HQ-OAR-2007-0544-0083.1). Commenters providing NEI updates are listed in Appendix A and discussed in section 2.1.2 of this document.

Table 1. List of Commenters on 40 CFR Part 63 Subpart S, Proposed December 27, 2011 (76 FR 81328)

Docket No. EPA-HQ-OAR-2007-0544	Commenter Name	Affiliation
0153	Anonymous	Not provided
0154	John Ashley	Weyerhaeuser New Bern Mill
0160	Shelia Holman	North Carolina Dept. of Environment and Natural Resources (NCDENR)
0161, 0161.1	J. Jared Snyder	New York Department of Environmental Conservation (NYDEC)
0162	Paul Noe	American Forest & Paper Association (AF&PA)
0163, 0163.1, 0163.2	Stephen E. Woock	Weyerhaeuser
0164	Russell Frye	SSM Coalition
0165	Roy McAuley	Alabama Pulp & Paper Council (APPCO)
0167	Dirk J. Krouskop	MeadWestvaco Corporation
0168	Melvin E. Keener	Coalition for Responsible Waste Incineration (CRWI)
0170	Dave Kiser	International Paper
0171	G. Vinson Hellwig and Robert H. Colby	National Association of Clean Air Agencies (NACAA)
0172	Traylor Champion	Georgia-Pacific LLC
0174, 0174.2	Paul Dickens and Michael Koerschner	Blue Ridge Paper Products Inc. dba Evergreen Packaging
0187	Kelly D. Bryant	Evergreen Packaging: Pine Bluff Facility
0190	Jeffery Shumaker	International Paper (NEI revisions)
0193	Anitra J. Collins	KapStone Roanoke Rapids Mill
0195	Richard Holland	Packaging Corporation of America (PCA)
0196	Matthew Todd	Residual Risk Coalition (R2C)
0198	Keith Wahoske	Georgia-Pacific - Port Hudson Operations
0207	Craig Liska	Verso Paper Corporation
0208	Ann Mason	American Chemistry Council (ACC)
212	Nina E. Butler	Rock-Tenn Company
0214	Gretchen Brewer	PT AirWatchers
0218 (with 6 file sets: 0219.1 - 0224.18)	Emma Cheus and James Pew, *et al.*	Earthjustice, Sierra Club, Northwest Environmental Defense Center, Concerned Citizens for Clean Air, Neighbors for Clean Air, and PT AirWatchers
0225	Gretchen Brewer	PT AirWatchers
0228	Melanie Loyzim	State of Maine

In some cases, one or more commenters endorsed the comments by another commenter. In those cases, the endorsement is noted in the "Miscellaneous Comments" section. The comment summaries are numbered sequentially (1, 2, 3, *etc.*) throughout the document, regardless of section.

2. Risk Assessment

2.1 Risk Assessment Inputs

2.1.1 Processing of ICR Data into Modeling File

1. Comment: Commenter 0161.1 disagreed with the EPA's presentation and explanation of their methods for arriving at the summary of the hazardous air pollutant (HAP) emission rates used in the emissions inventory. This commenter did not think the EPA provided enough information to verify the accuracy of their work. In this commenter's review of the data, they constructed Table 2 below to show the inaccuracies they believe are present in information released by the EPA.

Table 2. Comparison of Emission Rates in EPA's Documents with Each Other and with Those Found in 2005 and 2009 Toxics Release Inventories (Submitted by Commenter 0161.1)

State	Facility Name[a]	Acetaldehyde Emissions (tpy)				
		RTR[b]	RTI[c]		2009 TRI[d]	2005 TRI[d]
			Initial	Final		
MI	Packaging Corporation of America – Filer City Mill	3.84	59.10	0.89	15.80	17.24
AL	Fort James-Pennington	36.92	25.62	6.42	33.00	26.50
SC	INTERNATIONAL PAPER:GEORGETOWN MILL	44.37	0.52	7.18	42.56	56.23
AL	International Paper Company	96.22	18.90	1.92	77.00	46.45
ID	Clearwater Paper Corp – PPD & CPD, Idaho	11.39	51.44	1.52	48.15	47.25

a. The "Facility Name" in the table above is that used in the RTR both in the "RTR Review file" and the RTI "Follow-Ups memo."
b. These emissions data are from the "RTR Review file" which originated with the National Emissions Inventory (NEI) data reported to the EPA by the states.
c. These emissions data are from the RTI "Follow-Ups memo" which came from the facilities' responses to the Information Collection Requests (ICRs) sent to them by EPA or RTI.
d. The Toxics Release Inventory (TRI) emission rates are submitted by the facilities directly to EPA.

Specifically, the commenter questioned which values from the following documents were used in the residual risk assessment:

1. "RTR review file for Pulp and Paper Production Proposal" ("RTR Review file") file found within the Air Toxics Web Site of EPA's Technology Transfer Network (TTN).

2. RTI November 2011 memorandum titled "Summary of Follow-Ups Conducted Regarding Residual Risk Modeling Results" ("Follow-Ups memo") found within the docket for the Pulp and Paper Industry NESHAP.

The commenter stated that EPA should explain why the acetaldehyde emissions used in this assessment were significantly reduced, when the reported NEI and TRI acetaldehyde emissions for these facilities were all within the range for 35 other facilities in this source category as reported in the 2009 Toxics Release Inventory (TRI) and the "RTR Review file." The RTI "Follow-Ups memo" indicates that the reduction of annual acetaldehyde emissions for the RTR assessment was triggered by findings of elevated cancer and non-cancer risk for these

facilities. The commenter questioned whether it was the closer nearby populated receptors that drove the higher risks predicted from these five facilities, not any suspiciously high emission rates, as stated in the RTI "Follow-Ups memo."

Response: The follow-ups memo cited by the commenter only presents the inventory changes that EPA received from mills in response to EPA's inquiries (*i.e.*, inventory changes for those particular emission units whose emissions data were undergoing review/revision).[1] The particular emission units with emissions undergoing revision are noted in the emission unit columns of Tables 1 and 2 of the follow-ups memo. The follow-ups memo does not include mill-wide totals, which are what the commenter has included in the RTR column and TRI columns in the table he provided with his comment. So, the commenter is actually comparing acetaldehyde emissions for the entire mill (in the RTR and TRI columns) to acetaldehyde emissions from one or more emission units (in the RTI columns) whose data were undergoing review/revision, which explains the large discrepancy in emissions. To clarify further, the emissions estimates in the RTR column are based on inventory updates provided by the mills in their responses to the 2011 information collection request (ICR) (using NEI data reported by the states as the baseline from which to provide their updates), corrected using the emissions data revisions in the RTI Final column. Regarding the commenter's concerns about the reasons for the emissions reductions, there were a number of valid reasons for the reductions, as described in the paragraphs below.

The erroneous acetaldehyde emissions for the PCA mill were discovered when EPA reviewed the preliminary chronic cancer risk results for the pulp and paper industry. The EPA had a concern regarding the acetaldehyde emissions from the wastewater treatment plant at the PCA mill, specifically the primary clarifier (EU ID WWTP1) and aerated lagoons (EU IDs WWTP2 and WWTP3). The 59.1 tons per year (tpy) estimate for acetaldehyde was the highest for the pulp and paper industry for this type of emission unit (wastewater) and nearly 50 times higher than the next highest semichemical mill for this type of emission unit. The EPA asked the mill to take another look at the acetaldehyde emissions for these emission units and verify the accuracy of the data. In their response, the mill said that they had an error in their spreadsheet calculation on the throughput multiplier for wastewater emissions—they multiplied by the wrong cell number.

The erroneous acetaldehyde emissions for the Georgia-Pacific Naheola mill (in Pennington, AL) were discovered by the mill in the process of responding to EPA inquiries regarding unusually high emissions from the Kamyr digester, washers, screens, smelt dissolving tank, and recovery furnace at the mill. In their review of the data, the mill noted that the Kamyr digester exhaust is collected and conveyed to the permitted destruction sources at the mill, so there are no direct emissions of any pollutant for the Kamyr digester (*i.e.*, emissions from the Kamyr digester are zero). The mill also used the opportunity to update the emissions from the other sources and provided documentation to support their re-calculated emissions.

The erroneous acetaldehyde emissions for the International Paper-Georgetown mill were discovered by the mill in the process of reviewing all of their inventory data after receiving an

[1] See memorandum from T. Holloway and K. Hanks, RTI, to J. Bradfield and B. Schrock, EPA, titled *Summary of Follow-Ups Conducted Regarding Residual Risk Modeling Results*, November 28, 2011, in the docket for the subpart S rulemaking.

inquiry from EPA regarding the tetrachloroethylene emissions from the clarifier (EU ID WWAER1) at the mill. In the process of reviewing the tetrachloroethylene data, the mill discovered incorrect emissions data for three other pollutants (acetaldehyde, methanol, and formaldehyde) from both the clarifier (EU ID WWAER1) and aerated stabilization basin (ASB) (EU ID WWAER2). According to the mill's consultant, the source of the incorrect data appears to have occurred during export of the data from the facility's data management system, resulting in the compounds and emissions rates being extracted and incorporated into the spreadsheet incorrectly.

The erroneous acetaldehyde emissions for the International Paper-Prattville mill were discovered by the mill in reviewing their Part II inventory data with the assistance of the National Council for Air and Stream Improvement (NCASI). According to the mill, the error in the acetaldehyde value for the ASB (EU ID WWTASB) appeared to be a transcription error.

The erroneous acetaldehyde emissions for the Clearwater Paper-Lewiston mill were discovered by the mill in the process of reviewing all of their inventory data after receiving an inquiry from EPA regarding the acrolein emissions from the wastewater treatment system (EU ID PR13) at the mill. According to the mill, a calculation error was made while updating the emissions for acetaldehyde and other HAPs for paper machines and pulp dryers; a correction was also made for emissions from wastewater treatment for all HAPs.

2. Comment: As support for their post-proposal NEI update, commenter 0174 submitted (in attachment 0174.2) emission factor guidance developed by NCASI and distributed to member companies in June 2011, entitled "Additional Information on Acetaldehyde, Formaldehyde, and Acrolein Emissions from Paper Machines and Pulp Dryers Located at Bleached Kraft Mills." The commenter noted that, while they made changes to their internal emissions inventory database based on the updated emission factors in the guidance document, they did not submit a corrected NEI update to EPA prior to proposal. To correct this oversight, the commenter submitted the inventory corrections for their mill with their public comment.

Response: We acknowledge receipt of the emission factor guidance distributed by NCASI. This document describes the basis for the pre-MACT paper machine emission factors in NCASI Technical Bulletin No. 973, post-MACT emissions test data collected by NCASI in 2009, and reevaluation of the emission factors. A number of mills used the updated emission factors in their Part II ICR responses that were used for risk modeling. The inventory corrections from the commenter have been incorporated in a memo to the docket summarizing all of the NEI revisions that have been received post-proposal, noting their likely effect on risk, and documenting the recommendation not to remodel risk.[2]

3. Comment: Commenter 0195 stated that limitations and errors in the input data and in the modeling methods used may still affect the ability of the RTR assessment to accurately characterize maximum off-site risk. The commenter expected that a more accurate and detailed characterization of emissions sources for their facility would result in lower, more realistic risk

[2] See memorandum from T. Holloway, RTI, to J. Bradfield, B. Schrock, K. Spence, and N. Swanson, EPA, titled *Recommendations Concerning Residual Risk Remodeling for the Pulp and Paper Industry,* May 8, 2012, in the docket for the subpart S rulemaking.

estimates. The commenter stated that independent verification of EPA's modeling was not available to the facility.

Response: The commenter's concerns about the limitations and errors in the modeling methods and the inability to independently verify EPA's modeling are addressed in our response in section 2.2 below, relating to Human Exposure Model (HEM) methodology. Regarding the commenter's concerns about the limitations and errors in the input data and the need for a more accurate and detailed characterization of emissions sources, we would expect the commenter's company to provide NEI data revisions to help us refine the inventories for their mills (if needed). The EPA issued a request for comment in the December 27, 2011 proposal asking for such corrections to the mill-specific HAP emissions data used in the risk modeling.

We have received and reviewed the post-proposal NEI data revisions that the commenter's company submitted for its Valdosta mill in Clyattville, GA and its Counce mill in Counce, TN. The Valdosta mill provided no revisions to its subpart S sources (MACT code 1626-1). All of the revisions for this mill relate to its subpart MM chemical recovery sources (MACT code 1626-2), specifically deleting all smelt dissolving tanks (SDTs) and recovery furnaces currently in the mill's inventory since they have been replaced with new units. No emissions data for the replacement units were provided, since initial test data for these units are not yet available. The Counce mill provided revisions to the data for its paper machines, black liquor storage tanks, and wastewater treatment system, which we have reviewed. No post-proposal NEI data revisions were received for the commenter's mills in Filer City, MI and Tomahawk, WI. The data revisions for the Valdosta and Counce mills are accounted for in a memo for the docket that summarizes the post-proposal NEI revisions for the pulp and paper industry in the context of determining whether or not to remodel risk.[3]

2.1.2 Changes to Mill-specific NEI Data

4. Comment: A number of mills submitted specific revisions to their NEI risk input files. Appendix A at the end of this document lists the mills providing NEI revisions.

Response: The NEI revisions were reviewed to determine whether they would influence the outcome of the proposed risk assessment results. Based on our review, we have concluded that the results of remodeling risk would most likely adjust the risk results for the subpart S source category downward (*i.e.*, reduce risk). Because of this, EPA has elected not to remodel risk for purposes of promulgating of the subpart S residual risk review, but instead to rely on the conclusions from the risk modeling conducted for the proposed rule. A memo for the docket has been prepared summarizing the NEI revisions, noting their likely effect on risk, and documenting the recommendation not to remodel risk.[4]

5. Comment: Commenter 0162 attached a February 24, 2012 memorandum from NCASI relating to hexachloroethane (HCE) emissions from brownstock washers and bleach plant

[3] See memorandum from T. Holloway, RTI, to J. Bradfield, B. Schrock, K. Spence, and N. Swanson, EPA, titled *Recommendations Concerning Residual Risk Remodeling for the Pulp and Paper Industry,* May 8, 2012, in the docket for the subpart S rulemaking.
[4] *Id.*

sources (see Attachment 3 to comment 0162).[5] Through this attachment, commenter 0162 stated that there is significant uncertainty about the isolated detect data for HCE from brownstock washers and bleach plant sources. The commenter noted that many facilities used emission factors from NCASI's Air Toxics Database to estimate HCE emissions from these sources and said that these NCASI emission factors were based upon limited test data from 1993, most of which were non-detects. According to the commenter, HCE was detected in one diffusion washer vent at a bleached pulp mill and not detected at three vacuum-drum washer systems (eleven total vents) at two bleached pulp mills. In addition, the commenter noted that HCE emissions were detected in one elemental chlorine free (ECF) bleach plant scrubber vent but not detected in six non-ECF bleach plant systems. Commenter 0162 stated that HCE is not a known pulping byproduct, and the conditions for its formation are not expected to exist either in brownstock washer systems or in bleach plant systems. The commenter noted that NCASI is planning to perform additional emissions testing of several vents from a vacuum drum washer system, a diffusion washer system, and a bleach plant scrubber to confirm the expected absence of HCE.

Response: Several mills submitting NEI revisions also submitted a copy of the NCASI memo, as noted in section 10.1 below. To resolve questions in the memo about the presence of HCE emissions from brownstock washers and bleach plant sources, NCASI conducted additional HCE emissions testing (as noted in the comment above) at these mill sources. The EPA has received a summary of the results of the NCASI testing, which provided the following information.

- At the vacuum drum washer, HCE was detected in all three sample runs at a detection limit significantly lower than that achievable with EPA Method 18. The average emission factor developed for the test was 1.32E-05 pounds per air-dried ton of unbleached pulp (lb/ADTUBP), which NCASI estimated to be three orders of magnitude lower than the previous, pre-MACT emission factor based on non-detect values at the analytical detection limit.

- At the diffusion washer, HCE was not detected in any of the three sample runs. In-stack detection limits for this testing ranged from 9.7 to 12.4 parts per billion by volume, dry basis (ppbdv), resulting in an average emission factor of less than 3.48E-06 lb/ADTUBP.

- At the ECF bleach plant scrubber vent, HCE was not detected in any of the three sample runs. In-stack detection limits for this testing ranged from 9.6 to 11.3 ppbdv, resulting in an average emission factor of less than 1.16E-04 lb/ADTBP.

Based on our review of these test results, we conclude that HCE is not emitted from diffusion washers and bleach plant scrubbers. Furthermore, since HCE has been found to be emitted from vacuum drum washers at much lower levels than previously reported (which were themselves based on non-detect values at the analytical detection limit), we conclude that the current NEI emission estimates for HCE from vacuum drum washers are not representative of actual emissions. Therefore, we have decided to accept the request for removal of HCE from

[5] See memorandum from Z. Emerson, NCASI, to file, titled *Hexachloroethane Emissions from Brownstock Washers and Bleach Plant Sources*, February 24, 2012.

brownstock washers and bleach plants in the mill inventories. To that end, HCE emissions data have been removed from the brownstock washers and bleach plants in the inventories of the 26 mills that submitted NEI revisions requesting the removal of the pollutant.

2.2 Risk Assessment Methods

6. Comment: Census Block vs. Fence Line. Commenter 0218 argued that the EPA's modeling understates cancer and other chronic health risk by assuming that chronic exposure to HAPs from each source occurs at the census block centroid and not at the facility fence or property line. The commenter expressed concern that, by declining to assess cancer and chronic non-cancer risk at the fence line, EPA's analysis fails to consider the actual level of risk for the "individual most exposed to emissions," as required by section 112(f). Estimating the annual average concentrations at the area-weighted centers of census blocks artificially underestimates the risk estimated for people at the fence line, since the center of a census block will almost always be further away from the facility than its fence line. Census blocks vary greatly in size, especially in less populated areas. As EPA admits, area-weighted centers of census blocks are likely to underestimate exposure in some cases because they "under-predict exposures for people in the census block who live closer to the facility." The commenter supported the EPA's decision to make exceptions, placing additional residential receptors where there were observable residences when census blocks were abnormally large, but wonders how the residences were identified, observing that EPA used out–of-date 2000 census data and satellite images may not provide reliable information. The commenter noted that the EPA adjusted receptor points in the HEM-AERMOD system to estimate acute health risks for residents living on the fence line. The commenter concludes that failing to assess risk at the fence would be unlawful, arbitrary, and capricious as such an approach fails to assess risk for the person "most exposed" to the source category's emissions.

Response: As we have noted in the development of previous residual risk regulations, such as the Hazardous Organic NESHAP (HON), in a national-scale assessment of lifetime inhalation exposures and health risks from facilities in a source category, it is appropriate to identify exposure locations where it may be reasonably expected that an individual will spend a majority of his or her lifetime. Further, in determining chronic risks, it is appropriate to use census block information on where people actually reside, rather than points on a fence line, to locate the estimation of exposures and risks to individuals living near such facilities. Census blocks are the finest resolution available as part of the nationwide population data (as developed by the U.S. Census Bureau); each is typically comprised of approximately 40 people or about 10 households. In EPA risk assessments, the geographic centroid of each census block containing at least one person is used to represent the location where all the people in that census block live. The census block centroid with the highest estimated exposure then becomes the location of maximum exposure, and the entire population of that census block is assumed to experience the maximum individual risk. In some cases, because actual residence locations may be closer to or farther from facility emission points, this may result in an overestimate or underestimate of the actual annual concentrations (although there is no systematic bias for average levels). Given the relatively small dimensions of census blocks in densely-populated areas, there is little uncertainty introduced by using the census block centroids. There is more uncertainty when census blocks are larger, although there is still no systematic bias. Thus, the EPA concludes that the most appropriate locations at which to estimate chronic exposures and risks are the census

block centroids because: (1) census blocks are the finest resolution available in the national census data, (2) facility fence lines do not typically represent locations where chronic exposures are likely (*i.e.*, people do not typically live at the fence line of facilities), and (3) as just described above, there is no systematic bias with respect to using census block centroids as an exposure surrogate for all individuals residing in that block.

This has been EPA's approach for estimating chronic maximum individual exposures and risks throughout the RTR program. In its peer review of the methodologies used to estimate risks as part of the RTR rulemaking efforts, the EPA's Science Advisory Board (SAB) endorsed this approach. In addition, the commenter is correct that EPA did not model population risks based upon the 2010 census data; at the time of modeling, the 2010 census data were not fully available and verified to ensure an accurate location of the modeled population receptors. To reduce our uncertainties in estimating population risks for census blocks with centroids located on the facility boundaries, EPA relocated the centroid to an off-site residential location. In these cases and the case when the census block was extremely large, EPA moved and added receptors to improve our risk characterization. These additional receptors were identified using satellite imagery provided by Google Earth. The EPA expects there are opportunities for both under- and over-estimating risk, based upon our modeling assumptions. Notably, uncertainties are described in section 4.1 of the risk assessment document. In part, this section states:

> If anything, the population exposure estimates are biased high by not accounting for short- or long-term population mobility, and by neglecting processes like deposition, plume depletion, and atmospheric degradation. Additionally, estimates of the maximum individual risk (MIR) contain uncertainty, because they are derived at census block centroid locations rather than actual residences. This uncertainty is known to create potential underestimates and overestimates of the actual MIR values for individual facilities, but, overall, it is not thought to have a significant impact on the estimated MIR for a source category. Finally, we did not factor in the possibility of a source closure occurring during the 70-year chronic exposure period, leading to a potential upward bias in both the MIR and population risk estimates; nor did we factor in the possibility of population growth during the 70-year chronic exposure period, leading to a potential downward bias in both the MIR and population risk estimates.

7. Comment: Commenter 0171 noted that, in assessing the cancer risks related to source categories in the past, EPA used long-term concentrations affecting the most highly exposed census block for each facility. The commenter believes this analysis diluted the effect of sources' emissions by estimating the impact at the centroid of the census block instead of at the property line or wherever the maximum exposed individual is. Since census blocks can be large geographically, depending on the population density, the maximum point of impact can be far from the centroid, including at or near the property line where people may live or work. In this assessment, however, when identifying the maximum individual risk receptor, EPA reviewed each individual facility and checked that the offsite concentration represented not just the closest census block centroid, but also the closest populated receptor.

Commenter 0161 supported EPA conducting a review of each individual facility and visually checking that offsite concentration represents the closest populated receptor for identifying maximum individual risk (MIR) receptors.

Response: We agree with the comments and have enhanced our receptor modeling to account for these problematic census blocks. For this source category, we added additional receptors, which resulted in a more accurate risk characterization.[6]

8. Comment: Background Exposure. Commenter 0218 asserted that the EPA failed to satisfy section 112(f)(2) by not following scientific recommendations and the best available science regarding the need to assess the full, cumulative impact of HAP exposure for affected local communities, and by failing to include past or background exposure as part of its health risk assessment. The commenter argued that the EPA failed to account for the impact of adding new air emissions to recent and past air emissions that the most-exposed people have already experienced from this source category for inhalation and multipathway risk assessments. The commenter asked the EPA to consider that pulp and paper facilities have emitted persistent, bioaccumulative HAPs for years in affected communities, and to account for the health risk that has already accrued due to higher historic emissions, emissions from multiple sources, and a build-up of contamination in the environment through deposition that then creates other routes of exposure. The commenter reminded the EPA that the SAB recommended that the EPA include an analysis of both background and incremental risk as part of a full cumulative impacts analysis.

Response: As an initial matter, we disagree with the commenters to the extent they are suggesting that we are required to consider the total risk from all HAP to particular communities as part of our section 112(f) review. The focus of section 112(f)(2) is to review the risk posed by the emissions of HAP from the "source category" to determine whether it is necessary to revise the MACT standard for that source category to ensure an ample margin of safety. While it is true that a community-by-community assessment of total risk may be informative and could lead to a determination of the primary source of risks within specific communities, such an analysis is well beyond the scope of section 112(f)(2). Furthermore, the uncertainties associated with sources of emissions outside of the source category under review can be significant. The Act establishes a staged approach to performing the residual risk review for the source categories regulated under section 112, and we have yet to begin our residual risk review for many source categories. Therefore, we do not even have preliminary inventories, much less more refined inventories yet, for many source categories. In addition, even assuming we could determine the primary source of risks, if those risks are due to sources outside the source category being regulated in the immediate regulation or outside the scope of section 112, the immediate action would be unable to address those risks. Despite those concerns, however, we note that background risks or contributions to risk from other sources, where such information is available and reliable, can be one of the relevant factors considered in the ample margin of safety (AMOS) determination, along with cost and economic factors, technological feasibility, and other factors. Thus, while we are not required (and, indeed, cannot) do a community-by-community analysis of total risk, we do consider available information as part of our AMOS analysis.

The EPA disagrees with the comments that we did not consider aggregate or cumulative risks. As discussed in detail in the risk document for this rule,[7] the assessments we conducted for the pulp and paper source category consider the cumulative cancer risks from all carcinogens and

[6] See U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category*, Appendix 7, "Dispersion Model Receptor Revisions and Additions for Pulp & Paper," in the docket for the subpart S rulemaking.
[7] See U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category* in the docket for the subpart S rulemaking.

the cumulative non-cancer hazard indices from all non-carcinogens (affecting the same target organ system) emitted from sources within the source category and also collocated sources at the same facilities. However, the commenter is correct that the assessments did not include background risks or contributions to risk from sources outside the facilities.

We note that section 112(f)(2) of the CAA expressly preserves our use of the two-step process for developing standards to address residual risk and interpret "acceptable risk" and "ample margin of safety" as developed in the Benzene NESHAP.[8] In the Benzene NESHAP, EPA rejected approaches that would have mandated consideration of background levels of pollution in assessing the acceptability of risk, concluding that "…comparison of acceptable risk should not be associated with levels in polluted urban air. With respect to considering other sources of risk from benzene exposure and determining the acceptable risk level for all exposures to benzene, EPA considers this inappropriate because only the risk associated with the emissions under consideration are relevant to the regulation being established and, consequently, the decision being made." (54 FR 38044, 38061, September 14, 1989).

Although not appropriate for consideration in the determination of acceptable risk, we note that background risks or contributions to risk from sources outside the facilities under review could be one of the relevant factors considered in the AMOS determination, along with cost and economic factors, technological feasibility, and other factors. Background risks and contributions to risk from sources outside the facilities under review were not considered in the AMOS determination for this source category, mainly because of the significant uncertainties associated with emissions estimates for such sources.

Finally, our approach here is consistent with the approach we took regarding this issue in the HON RTR, which the court upheld in the face of claims that the EPA had not adequately considered background.

9. Comment: Commenter 0162 expressed concern about EPA's use of a version of its HEM3 model and corresponding receptor and meteorological data sets that are not in the public domain, which the commenter indicated prevented them from independently verifying and interpreting EPA's risk findings. Specifically, the commenter said that, in applying HEM3, EPA applied a more robust set of hourly meteorological data than the data available on the HEM3 website. In addition, the commenter said that EPA revised the population-based receptor files in HEM3 to exclude receptors that appeared to be on-site and to add receptors in nearby residential areas. According to the commenter, while EPA had, upon their request, shared detailed HEM3 output, the unavailability of the updated program and data prevented a more in-depth and comprehensive review and examination of the effects of correcting model inputs in terms of modeled risks.

Commenter 0196 stated that EPA should place the HEM model and corresponding data sets in the docket for this rule to allow for public review and comment of these key materials. The commenter noted that EPA computed the inhalation risk estimates for this sector using the Agency's Human Exposure Model (HEM3-AERMOD). According to the commenter, for this

[8] *National Emission Standards for Hazardous Air Pollutants: Benzene Emissions from Maleic Anhydride Plants, Ethylbenzene/Styrene Plants, Benzene Storage Vessels, Benzene Equipment Leaks, and Coke By-Product Recovery Plants* (54 FR 38044, September 14, 1989) (Benzene NESHAP).

assessment, EPA updated the public domain version of HEM3 so that the program implements the current version of AERMOD. While these types of modeling enhancements are suitably incorporated into the RTR, the commenter stated that EPA's use of a version of HEM3 and corresponding receptor and meteorological data sets that were not in the public domain prevented them from independently verifying and interpreting EPA's risk findings. The commenter argued that this created a "public notice" problem that easily could be corrected by placing the model and corresponding data sets in the docket and providing an opportunity for public comment on these materials.

Response: The commenter is correct that the version of HEM3 currently posted on our website is not the version we used in the modeling of this source category. For this source category, we used a version of HEM3 that includes a more recent version of the AERMOD dispersion model (Version 09292), which is the main difference between the HEM3 version we used and the version posted on our website (which includes AERMOD Version 07026). Updates to AERMOD occur fairly regularly (there have been six since 2006) for bug fixes and model enhancements, but typically the differences in modeled concentrations between updates are small, and there was only one AERMOD update between the HEM3 versions of interest here. Therefore, it is likely that the two HEM3 versions would produce similar results, and the version currently posted on our website is adequate to verify the results for a facility.

The commenter is also correct that for this source category we made revisions to the census block centroid locations, where necessary, to avoid using as human exposure receptors those block centroids that are located within facility boundaries. We use the block centroids as receptors for chronic exposures (*i.e.*, as surrogates for residential locations), and these require relocation in cases where they do not represent the population within the block. We also created additional receptors in cases where the census blocks are large and the block centroid locations may not represent the highest exposures. The census block data are publicly available, and the changes we made to revise block centroid locations and create additional receptors are documented in Appendix 7 to the risk assessment document for this source category.[9]

Regarding the comment about EPA applying "a more robust set of hourly meteorological data than the data available on the HEM3 website," the commenter did not provide any detailed information to indicate which, if any, facilities were modeled with meteorological data that are not available on the website. We do occasionally obtain meteorological data from state and local agencies that they have processed for use by facilities in their localities, and we have included some of these data in the HEM3 meteorological data library we use when we perform HEM3 modeling. We strive to keep our website up to date with these data, but the website may not always be current. As discussed above, we are preparing a new HEM3 version to post on our website, and we intend to significantly update our meteorological data then.

[9] See U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category*, Appendix 7, "Dispersion Model Receptor Revisions and Additions for Pulp & Paper," in the docket for the subpart S rulemaking

2.2.1 Modeling of MACT Allowable Emissions

10. Comment: Commenter 0218 supported the EPA's decision to consider "allowable" emissions as well as "actual" emissions, so that EPA can understand the amount of health risk its current standards allow to occur.

Response: We have discussed the use of both allowable and actual emissions in previous actions, including the final Coke Oven Batteries residual risk rule (70 FR 19998-19999, April 15, 2005) and in the proposed and final HON residual risk rules (71 FR 34428, June 14, 2006, and 71 FR 76603, December 21, 2006, respectively). In those previous actions, we noted that modeling the allowable levels of emissions (*i.e.*, the highest emission levels that could be emitted while still complying with the NESHAP requirements) is inherently reasonable since they reflect the maximum level sources could emit and still comply with national emission standards. But we also explained that it is reasonable to consider actual emissions, where such data are available, in both steps of the risk analysis, in accordance with the Benzene NESHAP. We also note that our use of allowable emissions levels in the risk assessments in this rulemaking did not result in revising the previously established standards due to risk concerns.

11. Comment: Commenter 0171 recommended that EPA consider potential or allowable emissions, rather than actual emissions, as much as possible in evaluating residual risk. Since facility emissions could increase over time for a variety of reasons, and with them the associated impacts, the use of potential or allowable emissions is more appropriate. The commenter argued that an analysis based on actual emissions from a single point in time could underestimate the residual risk from a source category. Further, the commenter noted that the major source HAP thresholds are based on maximum potential-to-emit, as opposed to actual emissions, and air agencies issue permits based on potential emissions. According to the commenter, limiting the scope of a risk evaluation to actual emissions would be inconsistent with the applicability section of part 63 rules. The commenter was pleased to see that EPA used allowable emissions in parts of the rulemaking but was concerned about the fact that EPA continues to use actual emissions in other parts of its assessment. Commenter 0171 encouraged the Agency to use allowable emissions in the future, including in assessing acute health risks.

Response: We disagree with the comment suggesting the use of allowable emissions in the assessment of acute health effects. Our worst-case acute health screen for the pulp and paper source category already uses conservative assumptions for emission rates, meteorology, and exposure location, including (1) using peak 1-hour emissions that are on average two times the annual average 1-hour emission rates; (2) assuming all emission points experience peak emissions concurrently; (3) using worst-case meteorology (from 1 year of local meteorology); and (4) assuming that a person is located downwind at the point of maximum impact during this same 1-hour period. Thus, we conclude that performing an acute analysis based on allowable emissions would result in an overestimation of potential acute impacts that it is not useful to decision makers.

12. Comment: According to commenters 0162 and 0196, EPA cannot lawfully use MACT allowable emissions in the proposed residual risk determinations because it has failed to provide any reasoned explanation for why risk assessments based on actual emissions estimates are inadequate. The commenters pointed out that CAA section 112(f)(1)(A) requires EPA to report

to Congress on "methods of calculating the risk to public health *remaining, or likely to remain*, from sources subject to regulation under this section after the application of standards under subsection (d) of this section" (emphasis added). In addition, the commenters noted that CAA section 112(f)(1)(B) requires EPA also to report on "the *actual health effects* with respect to persons living in the vicinity of" affected sources" (emphasis added). The commenters asserted that these requirements clearly signal that Congress expected EPA to focus on actual risk and not hypothetical risk in implementing the requirements of section 112(f). According to the commenters, it is not reasonable in the first instance for EPA to construe section 112(f) as authorizing EPA risk assessments based on hypothetical "MACT allowable" emissions.

The commenters further noted that EPA's risk assessment methodology already reflects numerous conservative assumptions. To illustrate, the commenters pointed out that health benchmarks (*e.g.*, acute reference doses), typically incorporate two to three orders of magnitude of conservatism to account for uncertainties, such as the extrapolation of animal toxicity testing data to humans. In a similar example, the commenters also pointed out that the dispersion models used to predict off-site ambient HAP concentrations attributable to emissions from affected sources incorporate numerous conservative assumptions to simplify the analysis of highly complex factors, such as meteorology, terrain, and atmospheric chemistry. In addition, the commenters noted that risk assessments assume exposure to the most exposed individual on a continuous basis for an entire lifetime.

Commenters 0162 and 0196 concluded that, in light of the conservatism that already is inherent in EPA's risk assessment methodology, it makes no sense to apply yet another layer of conservatism to section 112(f) risk assessments–this time based on the hypothetical assumption that affected sources should be expected to emit more than the actual data indicate. The commenters also argued that EPA had provided no data or analyses indicating that its current methodology would result in a negative bias. According to the commenters, EPA has provided no data demonstrating that affected sources actually do emit at levels significantly higher than the actual data show for any significant period of time, or should reasonably be expected to do so.[10] To conclude, the commenters argued that EPA's proposal to use hypothetical emissions levels in section 112(f) risk assessments was based on nothing more than the unsupported assertion that sources might emit at these higher levels. According to the commenters, the failure to provide a reasoned explanation or evidence as to why this approach is justified and the failure to provide any record evidence supporting the use of MACT allowable emissions renders the proposal insupportable under the law.

Response: We have discussed the use of both allowable and actual emissions in previous actions, including the final Coke Oven Batteries residual risk rule (70 FR 19998-19999, April 15, 2005) and in the proposed and final HON residual risk rules (71 FR 34428, June 14, 2006, and 71 FR 76603, December 21, 2006, respectively). In those previous actions, we noted that modeling the allowable levels of emissions (*i.e.*, the highest emission levels that could be emitted while still complying with the NESHAP requirements) is inherently reasonable since they reflect the maximum level sources could emit and still comply with national emission standards. But we

[10] According to the commenter, mills necessarily design and operate their emission control systems to operate at emission rates below the applicable standards, to provide a compliance margin that accommodates variability in process and control equipment.

also explained that it is reasonable to consider actual emissions, where such data are available, in both steps of the risk analysis, in accordance with the Benzene NESHAP.

We also note that our use of allowable emissions levels in the risk assessments in this rulemaking did not result in a different outcome than the use of the actual emission levels.

2.2.2 Modeling of Facilitywide Emissions

13. Comment: Commenter 0218 stated that the EPA failed to recognize the significance of its facility-wide risk assessment, and to satisfy section 112(f)(2), the EPA must perform a cumulative impacts analysis that combines this source category's individual impact with the impact from other sources. The commenter cited statements from the mineral wool production and wool fiberglass manufacturing NESHAP and EPA's 2007 resource document on cumulative health risk assessment of multiple chemicals, exposures and effects (attached to the comment letter) indicating the EPA's acknowledgement of the importance of cumulative impacts. The commenter supported the EPA's recognition of the need to consider facility-wide risk in this rulemaking, but questioned the EPA's conclusions that the pulp and paper source category did not drive the facility-wide cancer and chronic non-cancer risk. The commenter argued that the EPA should not focus on the 50 percent cut-off, because numbers below that may merit greater emission reductions from this source category to reduce the facility-wide risk overall.

Commenter 0218 recommended that the EPA perform a cumulative impacts analysis by combining current baseline emissions, exposures, and health impacts in addition to those of the specific source category EPA is reviewing. As part of this analysis, the commenter added, the EPA should aggregate or add the emissions for the most-exposed communities coming from: (1) the source category (including all individual sources within it); (2) facility-wide risk from collocated sources outside of this category; and (3) all other sources of toxic air pollution in the area. The commenter suggested that the EPA aggregate the community's exposure and assess the full health threats faced by the affected community, including from the sources under review. To perform this step, EPA must also draw on California EPA's Office of Environmental Health Hazard Assessment OEHHA community assessment approach.

To the contrary, commenters 0162 and 0196 argued that, despite EPA's assertion that it examines the risks from the entire facility in order to put the source category risks in context (where "facility" includes all HAP-emitting operations within a contiguous area and under common control (76 FR 81338)), EPA is without authority to consider facility-wide risks because the CAA requires residual risk determinations to be conducted on a category-by-category basis. Commenter 0162 noted that section 112(f)(2)(A) unambiguously requires EPA, within 8 years after adopting a MACT standard for a given source category or subcategory, to "promulgate standards for such category or subcategory if promulgation of such standards is required in order to provide an ample margin of safety to protect public health." According to the commenter, section 112(f)(2)(A) further dictates that, "Emissions standards promulgated under this subsection shall provide an ample margin of safety to protect public health." The commenter asserted that it is not reasonable to construe these provisions as authorizing EPA to consider emissions from entire facilities in conducting risk assessments and potentially revising the underlying rule, for the simple reason that the Congress clearly envisioned that full implementation of the MACT program would take longer than 8 years. Commenters 0162 and

0196 concluded that it would be impossible for EPA to fulfill its unambiguous obligation for section 112(f) standards to protect public health with an ample margin of safety in cases where facilities contain sources in a category where the 8-year deadline for conducting the section 112(f) risk review precedes the adoption of MACT standards for other sources at the facilities.

Commenter 0162 further pointed out the provision in section 112(f)(2)(A), which states that:

> [i]f standards promulgated pursuant to subsection (d) of this section and applicable to a category or subcategory of sources emitting a pollutant (or pollutants) classified as a known, probable or possible human carcinogen do not reduce lifetime excess cancer risks to the individual most exposed to *emissions from a source in the category or subcategory* to less than one in one million, the Administrator shall promulgate standards under this subsection for such source category. (emphasis added)

According to commenters 0162 and 0196, this provision unambiguously requires the section 112(f) risk assessment to be focused exclusively on "emissions from a source in the category or subcategory." The commenters argued that, for this reason alone, EPA does not have authority to consider emissions from any sources other than those in the source category or subcategory under review at that time. As a result, the commenter concluded, the risk assessment EPA conducted for the proposed rule overstates the risks that EPA was supposed to be considering in the residual risk review for subpart S.

Response: Facility-wide risk estimates were three times higher than the risk from the pulp and paper subpart S source category. When facility-wide risk estimates are significant and significantly larger than the source category risk estimates, we determine the key emission sources associated with that difference and describe them along with our plans to address them via regulation in the preamble. We may also perform additional quality assurance (QA) on the facility-wide emissions in such cases. In the case of this rulemaking package, the results were not significantly higher than the source category risk estimates and did not change any of the risk-based decisions, so additional follow-up was not needed or performed.

An assessment of the cumulative cancer risks from emitted carcinogens and the cumulative non-cancer hazard indices from all emitted non-carcinogens affecting the same target organ system (*i.e.*, a target organ-specific hazard index [TOSHI] value) for the source category emissions was conducted by EPA. This assessment excluded background contributions. The incorporation of additional background concentrations from the environment in our risk assessments from the past and future (including those from mobile sources and other industrial and area sources) are neither mandated nor barred from our analysis. In developing the decision framework in the Benzene NESHAP used for making residual risk decisions, EPA rejected approaches that would have mandated consideration of background levels of pollution in assessing the acceptability of risk, concluding that comparison of acceptable risk should not be associated with levels in polluted urban air'' (54 FR 38044, 38061, September 14, 1989). Background levels of certain HAPs can be relatively high, perhaps even above a level that might be considered "safe." Background levels (including natural background) are not barred from EPA's AMOS analysis, but EPA may consider them, as appropriate and as available, along with

other factors, such as cost and technical feasibility, in the second step of its section 112(f) analysis.

2.2.3 Modeling of Acute Exposure

14. Comment: Commenter 0161 supported EPA's guidelines to assess acute exposures in a community to never exceed short-term occupational guidelines that are used to protect healthy adult workers. However, commenter 0161.1 expressed concern for EPA's use of acute exposure guideline levels (AEGLs) or emergency removal program guidelines (ERPGs) to address acute exposure. The commenter stated that the use of these values is for once-in-a-lifetime short-term exposure to airborne concentrations of acutely toxic chemicals. The AEGLs and ERPGs do not have safety and uncertainty factors associated with them. The commenter believes that the EPA's use of the California reference exposure levels (RELs) to address the acute exposures in its residual risk assessments is a reliable and realistic approach to assess the potential for acute public health impacts for sensitive subpopulations.

Commenter 0171 also stated that the use of AEGLs or ERPGs in residual risk assessments is not appropriate and does not ensure that public health is adequately protected from the acute impacts of HAP exposure. These limits were developed for accidental release emergency planning and are not appropriate for assessing daily human exposure scenarios. In the December 2002 EPA document, "A Review of the Reference Dose and Reference Concentration Processes," EPA stated that the primary purpose of the AEGL program is to develop guidelines for once-in-a-lifetime, short-term exposures to airborne concentrations of acutely toxic chemicals. They are not meant to evaluate the acute impacts from routine emissions that occur over the life of a facility. Unlike the reference concentrations (RfCs) for chronic exposures, the AEGLs and ERPGs do not include adequate safety and uncertainty factors and cannot be relied upon to protect the public from the adverse effects of exposure to toxic air pollutants. The commenter expressed gratification to see that EPA has increased its reliance on the California RELs to address acute exposures in the residual risk assessments, and the commenter continued to urge EPA to use RELs for these assessments. The commenter also appreciated EPA's recognition that the guidelines for acute exposures in a community should never exceed short-term occupational guidelines used to protect healthy adult workers.

Response: When available, EPA uses AEGL and ERPG values in conjunction with REL values to fully characterize potential acute health risks. However, it is often the case that HAPs do not have all of these acute reference benchmark values. In these instances, EPA can only describe the potential acute health risk in relation to the acute health values that are available. Importantly however, when interpreting the results, we are careful to note the definition of the benchmark being used and the health implications associated with any specific benchmark being exceeded.

15. Comment: Commenter 0161.1 stated the average hourly emissions rate is defined as the total emissions for a year divided by the total number of operating hours in the year. The choice of a factor of 10 for acute screening is the default for the HEM3 model, and it is based on engineering judgment. However, for the pulp and paper source category, EPA has maximum hourly emissions estimates for each process group that indicate that a factor of two is more appropriate for this source category. The EPA determined that the worst-case maximum

estimated 1-hour exposure to formaldehyde outside the facility fence line had a hazard quotient (HQ) of five or a predicted ambient concentration of 250 micrograms per cubic meter (ug/m^3). This concentration exceeds the short-term recommended exposure level (REL) for formaldehyde developed by National Institute for Occupational Safety and Health (NIOSH) of 0.12 ug/m^3 for any 15-minute period in a work day. The EPA undertook a refined analysis of the worst-case maximum 1-hour exposure estimate for formaldehyde, and the predicted impact remained the same, indicating that the maximum concentration likely came from one particular source. The HEM3 model becomes overly conservative when calculating the maximum receptor from multiple sources (see Appendix 7 of draft risk assessment report).

Response: The formaldehyde NIOSH level is 0.12 milligram per cubic meter (mg/m^3) vs. the 12 mg/m^3, resulting in a $HQ_{NIOSH} = 2$. A review of the MIR facility for acute non-cancer impacts identified that 96 percent of the emissions of formaldehyde were emitted from a two sources (*i.e.*, wastewater kraft emissions). The MIR off-site location for this facility was the St. Paul Waterway in Commencement Bay just North of Tacoma, WA. The HQ values where people reside for this facility would result in a $HQ_{NIOSH} < 1$.

16. Comment: Commenter 0218 stated that, by ignoring risk from malfunctions, other violations, and higher emissions during startup periods, EPA's proposal fails to consider the full cancer and chronic non-cancer health risk from this source category. The commenter observed that the CAA specifically requires EPA to base its risk analysis on the highest potential risk "to the individual most exposed to emissions from a source in the category or subcategory." The commenter stated that it is necessary for the EPA to analyze risk based on what emissions may indeed occur during a malfunction and other types of violations, even with the MACT standard in place. The commenter noted that these events increase HAP emissions and thereby pose increased health risks which EPA must consider.

The commenter also argued that although the "allowable" emissions limit represents the maximum level of emissions to which an individual may legally be exposed from a given facility under the existing MACT, that analysis is incomplete because facilities may violate that standard and emit HAPs at a level beyond what is "allowable" under the rule. The commenter asserted that the EPA knows that there is additional risk from malfunctions and violations and it cannot ignore that risk. The commenter asked that the EPA should account for the heightened risk from exceedances of the MACT in its risk calculation, using data regarding the use of the malfunction exemption and enforcement actions in the past and other information it has regarding the history or likelihood of malfunctions or other violations. The commenter pointed to the EPA's use of a worst-case scenario used to calculate acute health risk, and suggested that the EPA should create a factor that would account for the potential for malfunctions and violations of the standard and then assess health risk accordingly for acute, cancer, and non-cancer risk when emissions spike above the allowable level under the existing standard. The commenter asked that the EPA consider the percent control efficiency for control devices used in the pulp and paper source category. When control devices fail, the commenter noted, emissions spike from the small percentage not controlled by the control device to the entire 100 percent from the controlled process.

The commenter stated that, although the EPA's MIR is based on the assumption that exposure is constant for a lifetime, spikes in emissions over a person's lifetime may

underestimate the amount of chronic risk based on pollutants that persist in the environment, including chromium and arsenic. The commenter asserted that the failure to account for greater risk due to malfunctions violates section 112(f)(2) and is arbitrary and capricious.

Response: We disagree with the commenter that emissions that exceed standards and are violations, whether or not caused by malfunction events, should be considered as part of the risk analysis. The purpose of the risk review is to evaluate whether the emission limits should be made more stringent to reduce the risk posed after compliance with the underlying MACT standard. To the extent that a source is violating the underlying MACT standard, no tightening of the emission standard under the residual risk rule will avoid or mitigate against such violations. In other words, a source that is violating the MACT emissions standard promulgated under section 112(d) would not be any more likely to be able to avoid such violations and comply with a different presumably more stringent standard promulgated under section 112(f). Such events are violations and subject to enforcement by the EPA, the states, or citizens, and an action for injunctive relief is the most effective means to address violations, whether or not they are caused by malfunctions, if an emissions event poses a significant health or environmental risk.

Although we disagree that emissions that result in a violation should be considered as part of the risk review, we do not expect malfunction events to contribute significantly to cancer or chronic non-cancer risks for the source category in this rulemaking because malfunction events are inherently short-term and infrequent relative to annual operations and emissions. The commenter did not supply any data to the contrary.

Furthermore, the conservative estimates built into the acute risk assessment are sufficient to gauge worst-case potential acute health effects. The conservative estimates built in to the assessment include worst-case meteorology, emissions in excess of the maximum peak emission rate from all point sources simultaneously, and the summation of the maximum impact of each emission source, regardless of receptor location.[11] Thus, even if we were to consider emissions that are in violation of the standard, we do not expect that they would result in any different level of control.

17. Comment: Commenter 0218 stated that the existing standards allow uncontrolled emissions to occur 1 to 10 percent of the time, for various sources (§§63.443(e), 63.446(g)), but noted that the EPA's risk assessment fails to consider the increased cancer, chronic non-cancer, and other types of health risk due to these periods of no-control. The commenter asserted that this violates section 112(f)(2) and is arbitrary and capricious. Further, the commenter asserted, the EPA cannot justify refusing to assess this health risk based on its theory that it can ignore exceedances of the standard, because under the existing standard these periods of "excess emissions" are allowed.

Commenter 0218 stated that the EPA failed to calculate the maximum acute health risk based on a true "worst-case" scenario, because the EPA, by not anticipating higher risk from malfunctions, had not used a high enough emissions factor for usual operation. The commenter questioned the EPA's multipliers to assess peak 1-hour emissions, arguing that higher ones

[11] See memorandum from T. Holloway, K. Hanks, C. Gooden, and M. Hakos, RTI, to J. Bradfield and B. Schrock, EPA, titled *Inputs to the Pulp and Paper Industry October 2011 Residual Risk Modeling*, Table 6B, November 11, 2011, in the docket for the subpart S rulemaking.

would be more appropriate. The commenter observed that the existing standards include excess emissions allowances, which EPA should remove, and that allow uncontrolled emissions 1 to 10 percent of the time.

The commenter stated that the EPA has not demonstrated that the multipliers that it used are high enough for pulp and paper to assess the true acute risk to the most-exposed individual and community under EPA's existing standards, recommending that the EPA use a multiplier of at least 10, noting that a factor of 10 is clearly too low to calculate acute health risk if a source, in a worst-case scenario, could emit as much as 12 to 50 times, or more, beyond its usual emissions.

Response: We acknowledge the commenter's concern that the excess emissions allowances in subpart S currently could permit uncontrolled venting of emissions from low volume high concentration (LVHC) and high volume low concentration (HVLC) collection systems and bypassing steam stripper systems for up to 1 percent, 4 percent, and 10 percent of time, respectively, for reasons described in the preamble to the April 15, 1998 final rule at 63 FR 18529-18530 (explaining that the allowances were established based on the downtime percentages experienced by the best-performing sources). In light of the *Sierra Club* decision (*Sierra Club v. EPA*, 551 F. 3d 1019 (D.C. Cir. 2008)), we requested comment on these excess emissions allowances in the December 27, 2011 proposal (76 FR 81346), and our response to these comments is provided in section 6 of this document.

We disagree with the commenter that the multipliers we used for assessing acute risk were too low. The risk assessment and acute multipliers for the pulp and paper subpart S source category were based on a detailed analysis of emissions inventory data collected in 2011 through a section 114 ICR. The ICR requested routine annual emissions (tpy) and the routine emissions maximum hourly rate (pounds per hour [lb/hr]) for the year. The routine emissions reported reflect actual emissions for the calendar year (*i.e.*, controlled emissions and emissions during any times when the excess emissions allowances were employed during the year). The annual (tpy) and peak (lb/hr) ICR data were compared to develop the peak-to-mean multipliers for the various emissions process groups in the subpart S source category. The resulting multipliers ranged from 1 to 3.1 and are presented in Table 3 below.[12] The results of our peak-to-mean analysis were similar to those from separate analyses provided by the pulp and paper industry for two types of emissions units (papermaking and wastewater). Even though we performed a detailed analysis of multipliers for the different emission process groups in order to understand the effect of any process-specific factors (such as the excess emissions allowances) that could potentially lead to different multipliers, we ultimately modeled with a single multiplier of 2 for each facility when estimating acute risks, consistent with our practice of conservatively estimating acute risks based on the maximum peak emission rate from all point sources simultaneously (with the exception being mechanical pulping, where the indicated multiplier of 3.1 shown in Table 3 below, was used). For the facilities that had an HQ > 1, the specific acute multiplier for each emission process group was used to accurately characterize the risk. The adjusted HQ values for each emission point was than summed and plotted to identify the polar or census block receptor with the maximum off-site acute non-cancer risk.

[12] *Id*.

In addition to being considered as part of the acute risk analysis, the excess emissions allowances were also taken into account in our analyses of chronic cancer and non-cancer risks based on both actual and "allowable" emissions. Like the acute analysis, the actual-emissions chronic risk analyses were based on the actual emissions reported in the ICR responses, which included controlled emissions and emissions during any times when the excess emissions allowances were employed during the year. The risk analysis for MACT allowable emissions was based on the actual emissions reported in the ICR responses (which included emissions during times covered under the excess emissions allowances) scaled up with an "allowable" factor to approximate the difference between actual emissions performance and the compliance margin MACT allows. The allowable factors were developed for the various emission process groups considering the most commonly used compliance options under subpart S.

Table 3. Acute Multipliers by Emission Process Group for Risk Modeling for Subpart S (MACT Code 1626-1)[13]

Emission process group	Acute multiplier		Emission process group	Acute multiplier
Bleaching: ClO_2 Generator	1.4		Kraft Stock Washing	1.2
Bleaching: Kraft	1.4		Manuf Misc	1.4
Bleaching: Mechanical	1.4		Mechanical Pulping	3.1
Bleaching: Sec Fiber	1.4		NSSC Misc	1
Bleaching: Sulfite	1.4		NSSC Pulping	1
Causticizing: Green Liquor	1.5		Paper Misc	1.6
Causticizing: Lime Mud	1.5		Paper Stock Prep	1.6
Causticizing: Misc	1.5		Papermaking	1.6
Causticizing: Slaker	1.5		Semichem Misc	1
Causticizing: White Liquor	1.5		Semichem Pulping	1
Condensate Stripper	1.2		Soda Misc	1.2
Kraft Misc	1.2		Storage Tanks - Alcohol	1.6
Kraft Pulp Storage	1.2		Storage Tanks - Methanol	1.6
Kraft Pulping: BL Tanks HVLC	1.2		Sulfite Pulping	1.6
Kraft Pulping: Decker	1.2		Sulfite Pulping (Ca)	1.6
Kraft Pulping: Digester LVHC	1.2		Sulfite Pulping (NH_3)	1.6
Kraft Pulping: Evaporator LVHC	1.2		Tall Oil	1.2
Kraft Pulping: HVLC	1.2		Wastewater (General)	2
Kraft Pulping: Incinerator	1.2		Wastewater (Kraft)	2
Kraft Pulping: Knotter	1.2		Wastewater (Mechanical)	2
Kraft Pulping: LVHC	1.2		Wastewater (NSSC)	2
Kraft Pulping: O_2 Delig HVLC	1.2		Wastewater (Semichem)	2
Kraft Pulping: Turpentine LVHC	1.2		Wastewater (Sulfite)	2
Kraft Pulping: Washing	1.2			

[13] *Id*.

To further alleviate concerns about acute risk, we note that events covered under the excess emissions allowances for LVHC and HVLC typically last less than one hour (some only a few seconds at a time). For the kraft condensate standards, the 10 percent allowance covers times when less than the required amount of HAP in condensates are collected (*e.g.*, due to process variability when HAP concentrations are lower than normal), or when a steam stripper could be bypassed. Condensates bypassing the stripper are typically routed to a mill's wastewater treatment system, where biological treatment occurs, and even wastewater treatment systems that are not designed and monitored for compliance with the condensate standards would provide some (*e.g.*, 80 to 90 percent) treatment of the kraft condensates (minimizing acute effects). Additionally, the excess emissions allowances could be triggered by times when monitoring parameters are outside of the pre-approved operating limits. While monitoring parameters serve as indicators of emissions, a slight deviation from pre-approved parameter limits accounted for against the backstop time limit of the excess emissions allowances does not necessarily reflect an acute emissions episode harmful to the population surrounding the mill. Finally, we note that the final rule requires additional repeat emission testing for kraft pulping processes and steam strippers and removes the SSM exemption–changes which should further reduce the potential for acute emissions episodes.

2.2.4 Multipathway Screening

18. Comment: Commenter 0161.1 recommended that EPA define the appropriate departure point for exceeding the mass screening value and requiring a multipathway risk analysis. The EPA used its Total Risk Integrated Methodology, Environmental Fate, Transport, and Ecological Exposure Module (TRIM.FaTE) to screen PB-HAPs for significant non-inhalation exposures. At all 38 facilities in the pulp and paper industry source category, the emissions rate for each PB-HAP was below the screening thresholds, with the exception of one facility for which the emission rate of polycyclic organic matter (POM) exceeded the screening threshold by a factor of two. The screening level is designed to represent a potential for creating a cancer risk in excess of 1-in-a-million or a non-cancer hazard index (HI) of 1. The commenter believes this to be a proper use of screening values. According to the commenter, the mass emission rate screening process would be successful if conservative input data were used within the TRIM.FaTE model and risk management decisions were incorporated into the decision making process. In this case, the commenter believes that EPA made a risk management decision not to conduct a multipathway risk analysis at a screening level of two times the mass emission rate, which, according to the commenter, equals approximately a 2-in-a-million cancer risk. The commenter believes that this approach contrasts favorably to EPA's risk assessment for the primary aluminum NESHAP source category, in which the emissions from POM exceeded the mass emission screening rate by 7,000 times for one facility and the EPA decided not to pursue a refined multipathway risk assessment. To avoid similar discrepancies, the commenter stated that EPA should create a defined hierarchy to require this type of risk assessment under the RTR program.

Response: As described above, since proposal, EPA has refined the emission screening thresholds in the multipathway screen based on TRIM.FaTE runs to screen risks from PB-HAP emissions. This revised Tier 1 screen uses improved toxicity rating/scaling methods for POMs and dioxin congeners as well as improved fate, transport, and uptake behavior through the

aquatic food chain. Based on the above changes, the facility-level emissions of POMs from the pulp and paper source category are now below the screening threshold by a factor of 9.

For more information on the changes made to the PB-HAP Tier I screening thresholds refer to Appendix 4 of the *Residual Risk Assessment for the Pulp & Paper Source Category* in the docket for the subpart S rulemaking.[14]

19. Comment: Commenter 0218 stated that the EPA failed to add multipathway risk to the inhalation risk to come up with a total cancer risk and a cumulative burden metric that EPA and the public can analyze, making EPA's overall risk assessment incomplete. The commenter recommended that the EPA use the multipathway assessment appropriately by adding the risk found there to the inhalation risks found, and then proceeding with the required section 112(f)(2) analysis to determine whether or not that total level of risk is acceptable, to show the full cumulative burden of health risk for the most-exposed person, and what standards are needed to reach an acceptable level and also to provide an ample margin of safety.

Response: It would be inappropriate for EPA to add a screening threshold exceedance as an estimate for multipathway risks with the modeled inhalation risks. The screening threshold is *not intended to be used to produce quantitative estimates* of actual or potential risk. Rather, it provides a basis for determining if residual human health risks are of potential concern. The screening thresholds are based upon a worst-case scenario, which likely overestimates exposures for the site; actual exposures will depend upon geography, meteorology, land-use, and other characteristics, as well as release parameters for those pollutants that are PB-HAPs.

20. Comment: Commenter 0218 disagreed with the EPA's conclusion that there is "no potential for . . . human health multipathway effects" from POM emissions. The commenter stated that the EPA's POM multipathway analysis is incomplete because EPA failed to conduct a full multipathway risk assessment, which includes consideration of a child's multipathway exposure, in urban and rural residential scenarios. The commenter recommended EPA conduct such a full multipathway risk assessment.

The commenter further stated that the failure of EPA to assess an exposed child scenario as part of the cumulative risk assessment ignores the exposures that may pose the most significant risk from this source category. The commenter highlighted the risk to children from contaminated soils, noting that past risk assessments have relied on outdated estimates of incidental soil ingestion exposures and stating that the EPA must update these values. The commenter cited two EPA exposure factors handbooks and a journal article as resources to use for assessing risks.

Response: The EPA disagrees with the commenter's statement that this risk assessment failed to consider children's exposure and early-life susceptibility. The EPA agrees that biological differences across life stages may lead to differences in the susceptibility to HAP, as can differences among population groups, due to pre-existing disease states or other factors. Accordingly, the methods we use in risk assessments have taken this into account. For the dose-response component of HAP assessments for RTR, the EPA uses exposure reference

[14] See U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category*, Appendix 4, "Overview of Tiered Approach to Assessing Multipathway Exposures for RTR," in the docket for the subpart S rulemaking

concentrations and unit risk estimates that are expressly derived with the objective of protecting sensitive populations and life stages, including children.[15] For example, a review of the chronic reference value process concluded that the Agency's RfC derivation process adequately considered potential susceptibility of different subgroups with specific consideration of children, such that the resultant RfC values pertain to the full human population, including "sensitive subgroups," which is inclusive of childhood. Cancer risk assessments are performed in accordance with EPA's Supplemental Guidance.[16] This Guidance recommends the application of age-dependent adjustment factors for assessing cancer risk from carcinogenic pollutants concluded to act via a mutagenic mode of action and for which information on early-life susceptibility is lacking. The basis for this methodology is provided in the 2005 Supplemental Guidance. With regard to other carcinogenic pollutants for which early-life susceptibility data are lacking, it is the Agency's long-standing science policy position that use of the linear low-dose extrapolation approach (without further adjustment) provides adequate public health conservatism in the absence of chemical-specific data indicating differential early-life susceptibility or when the mode of action is not mutagenicity.[17]

The EPA developed the scenario in the multipathway screen in order to estimate the upper end of the range of individual, long-term, non-inhalation exposures for situations likely to be encountered in the United States. The approach is described in the "Overview of Tiered Approach to Assessing Multipathway Exposures for RTR," available as Appendix 4 to the risk assessment document for subpart S.[18] This approach has been reviewed and approved by the SAB to characterize a worst-case scenario in a rural environment; we contend that the parameters used for this simulation are reasonable for purposes of conducting a multipathway assessment for both adults and children, especially considering the close proximity of the emission source(s) to farmland and/or fishable lakes, which are major considerations in conducting a multipathway risk assessment.

The EPA purposely designed the multipathway scenario to produce conservative (*i.e.*, health protective) results. To this end, EPA applied the following critical exposure/activity assumptions: fresh water fish ingestion rates (99th percentile); food ingestion rates (90th percentile rates)[19]; adults/children greater than 6 years of age (90th percentile)[20]; and soil ingestion children less than 6 years of age (95th percentile).[21] These ingestion rates are based upon EPA's 2011 *Exposure Factors Handbook* and have been revised to reflect high-end

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[15] See U.S. EPA (2002), *A Review of the Reference Dose and Reference Concentration Processes*. EPA/630/P-02/002F. Risk Assessment Forum, Washington DC. Available online at: *http://www.epa.gov/raf/publications/pdfs/rfd-final.pdf*.

[16] See U.S. EPA (2005), *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens*. EPA/630/R-03/003F. Washington, DC. Available online at: *http://www.epa.gov/cancerguidelines/guidelines-carcinogen-supplement.htm.*

[17] *Id*.

[18] See U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category*, Appendix 4, "Overview of Tiered Approach to Assessing Multipathway Exposures for RTR," in the docket for the subpart S rulemaking.

[19] See U.S EPA, *Exposure Factors Handbook: 2011 Edition*; EPA/600R-090/052F. Available online at: *http://www.epa.gov/ncea/efh/pdfs/efh-complete.pdf*

[20] *Id.*

[21] Stanek, E., EJ Calabrese, R Barnes, & P Pekow. (1997) "Soil ingestion in adults – results of a second pilot study." *Toxicol. Environ Safety*, 36(249-257).

consumption rates for the general public and high-end rates for at-risk populations, such as children ingesting contaminated soil.

21. Comment: Commenter 0218 stated that the EPA did not perform a full multipathway risk assessment for lead, and this is unlawful, irrational, and unjustified. The commenter observed that EPA compared the ambient air concentrations caused by the facilities' emissions with the 2008 national ambient air quality standard (NAAQS) for lead (0.15 $\mu g/m^3$) to assess whether there would be exceedances of the NAAQS, but what is "adequate" under section 109 is not necessarily "acceptable" under section 112. The EPA must ensure that it sets standards that provide an "ample margin of safety to protect public health." The commenter concluded that the EPA should have performed a full multipathway risk assessment for lead that looked at the full exposure from ingestion and dermal pathways, such as through soil and breast-milk exposure.

Response: The lead NAAQS was a public health policy judgment considering the available health evidence and risk analyses, as well as the uncertainties associated with the health evidence and risk analyses. We disagree with the commenter that the lead NAAQS cannot be used in a quantitative manner. The review of the lead NAAQS clearly resulted in a quantitative standard: 3-month maximum lead concentration not to exceed a level of 0.15 $\mu g/m^3$.

The NAAQS for lead was set to protect, with an adequate margin of safety, the health of children and other at-risk populations against an array of adverse health effects, most notably neurological effects, particularly neurobehavioral and neurocognitive effects, in children. 73 FR 67007. Because of the multipathway, multimedia impacts of lead, the risk assessment supporting the NAAQS for lead considered direct inhalation exposures and indirect air-related multipathway exposures from industrial sources like primary and secondary lead smelting operations. It also considered background lead exposures from other sources, like contaminated drinking water and exposure to lead-based paints. During the NAAQS review process, these risk estimates were judged to be roughly consistent with, and generally supportive of, the evidence-based framework applied in the NAAQS determination (73 FR 67004). Taken together, the EPA asserts that the lead NAAQS is a reasonable benchmark to evaluate the potential for multipathway health effects from lead.

Also, as noted in the risk assessment document[22], there is no reference dose (RfD) or other comparable chronic health benchmark value for lead compounds. That is, in 1988, the EPA's Integrated Risk Information System (IRIS) program reviewed the health effects data regarding lead and its inorganic compounds and determined that it would be inappropriate to develop an RfD for these compounds, saying:

> A great deal of information on the health effects of lead has been obtained through decades of medical observation and scientific research. This information has been assessed in the development of air and water quality criteria by the agency's Office of Health and Environmental Assessment (OHEA) in support of regulatory decision-making by the Office of Air Quality Planning and Standards (OAQPS) and by the Office of Drinking Water (ODW). By comparison to most other environmental toxicants, the

[22] See U.S EPA, *Residual Risk Assessment for the Pulp & Paper Source Category*, in the docket for the subpart S rulemaking

degree of uncertainty about the health effects of lead is quite low. It appears that some of these effects, particularly changes in the levels of certain blood enzymes and in aspects of children's neurobehavioral development, may occur at blood lead levels so low as to be essentially without a threshold. The agency's RfD Work Group discussed inorganic lead (and lead compounds) at two meetings (07/08/1985 and 07/22/1985) and considered it inappropriate to develop an RfD for inorganic lead.[23]

The lead NAAQS applies in all areas of the United States regardless of the age of the individuals living in a particular area. Thus, we find it appropriate to evaluate potential multipathway risks, in a quantitative manner, using the NAAQS for lead.

22. Comment: Commenter 0218 expressed concern that the EPA restricted its multipathway risk screening assessment for this source category to only those contaminants that were identified in the 2003 Risk Assessment Guidance as being both persistent and bioaccumulative in the environment (*i.e.*, PB-HAPs). The commenter observed that this list of 14 PB-HAPs is incomplete, as it ignores other HAPs that present multipathway risks. The commenter stated that the EPA's restrictive choice is not supported by the 2003 Guidance and underestimates risks from HAPs emitted by this source category. The commenter specifically named all metals emitted by this source category, including chromium, arsenic, nickel, and manganese, as pollutants that require a full multipathway risk assessment. The commenter cited the California OEHHA recommendation of multipathway assessment for these metals. The commenter concluded that the EPA may not assume that the ingestion risks are zero for these pollutants, and doing so when science shows otherwise is arbitrary and capricious. The commenter stated that not assessing multipathway risk from exposure to these HAPs via incidental ingestion, both individually and cumulatively, results in an underestimation of the risks of HAP emissions from this source category. The commenter also recommended that naphthalene, as a polycyclic aromatic hydrocarbon (PAH), must be considered in the POM category.

Response: In the Air Toxics Risk Assessment Reference Library[24], we developed the current PB-HAP list considering all of the available information on persistence and bioaccumulation (see *http://www.epa.gov/ttn/fera/risk_atra_main.html*, specifically Volume 1 Appendix D). (The Air Toxics Risk Assessment Reference Library provides information on the fundamental principles of risk-based assessment for air toxics and how to apply those principles in different settings (*e.g.*, facility-specific), as well as strategies for reducing risk at the local level.) This list of HAPs has been identified as PB-HAP by other EPA Program Offices (*e.g.*, the Great Waters Program) and also based upon information from the PBT profiler (see *http://www.pbtprofiler.net/*). This list was peer-reviewed by the SAB, and it is reasonable to use it in the RTR program. Given that the commenter did not provide additional information for arsenic, nickel, chromium, naphthalene, and manganese, we do not currently have sufficient justification for expanding our list of PB-HAP.

23. Comment: Commenter 0218 objected to the EPA's use of reported emissions rather than allowable emissions in its multipathway assessment, stating that the EPA has not assessed the

[23] See the EPA's IRIS assessment for Lead and compounds (inorganic) (CASRN 7439-92-1). Available online at: *http://www.epa.gov/iris/subst/0277.htm*.
[24] See *http://www.epa.gov/ttn/fera/risk_atra_main.html.*

full potential for non-inhalation health risk due to persistent and bioaccumulative emissions. The commenter observed that intermittent or short spikes of PB-HAPs can represent a significant health risk because the contaminants stay in the environment and small amounts can accumulate into larger amounts over time. The commenter stated that failing to account for the full multipathway risk that EPA's existing standard allows, or for risk due to violations from that standard, violates the section 112(f)(2) requirement to ensure protection for the individuals "most exposed" to the source category.

Response: As noted in our risk assessment report[25], allowable emissions were about 1.5 times greater than actual emissions for this source category. Because there is a linear relationship between emissions and the results of this worst case screen, considering allowable emissions, the current screening level for POMs is approximately 6 times greater than the estimated allowable emissions. These allowable emissions do not exceed our POM screening thresholds and are estimated to be below an excess cancer risk of 1 in a million.[26]

2.2.5 Dose-response Benchmarks

24. Comment: Commenter 0218 stated that the EPA must assess health risk from all pollutants, even where it has no current reference value, and must use an uncertainty factor to make up for the lack of a reference value. The commenter observed that the EPA's risk assessment acknowledges the emission of other HAPs for which it has no reference values, but that the EPA failed to assess risk at all for these pollutants. The commenter also stated that the EPA did not carry out a qualitative assessment of these HAPs, in effect assuming that risk from the HAPs is zero, which is not justified, and which underestimates health risk. The commenter asserted that at minimum, EPA must use an uncertainty factor to make up for the lack of reference values, and EPA may not treat risk as zero for a HAP simply because it has no reference value for the health risk from that HAP. Section 112 requires EPA to address all emitted HAPs in its regulation. The commenter concluded that EPA must address this uncertainty by selecting a health-protective value based on the information it does have, so that it may consider the potential risk and find an appropriate way to assess that risk in this rulemaking. In the absence of an available reference dose, EPA must, at minimum, add an uncertainty factor to account for the additional risk that a HAP likely causes, until such time as EPA does have a reference value to use. Using a protective uncertainty factor would allow EPA to satisfy its legal duty under section 112(f)(2) to prevent unacceptable health risk and ensure an "ample margin of safety to protect public health."

The commenter pointed to section 112(f)(2) of the CAA as creating a critical duty and opportunity for EPA to conduct a comprehensive and protective analysis of residual risk to public health and the environment. However, over the 20 years after the CAA was amended, the IRIS review process has been bogged down for many pollutants, and sufficient studies for some HAPs have not been conducted to allow calculation of reference doses, reference concentrations,

[25] See U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category*, in the docket for the subpart S rulemaking.

[26] For more information on the changes made to the PB-HAP screening thresholds, refer to U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category*, Appendix 4, "Overview of Tiered Approach to Assessing Multipathway Exposures for RTR," in the docket for the subpart S rulemaking.

or potency values. The commenter asserted that the EPA should prevent the delay in this process from undermining its residual risk analysis for this and other source categories.

The commenter recommended that for formaldehyde, methanol, and all other pollutants currently under IRIS reassessment, EPA must use the best available scientific information from the IRIS review during the current rulemaking. The commenter stated that if EPA determines that it must wait until these reassessments are complete to use the newly available scientific information, then EPA must take a more protective approach due to the outdated health risk reference information that it is using. For formaldehyde, the commenter supported the EPA using the 1991 IRIS value, as well as information from the new IRIS review, rather than the industry-created value from the Chemical Industry Institute of Toxicology (CIIT), which is less protective.

The commenter suggested that to account for the delay and lack of reference values for some pollutants, and the fact that it is still updating the toxicity information for other pollutants, EPA must set a regulatory deadline no later than 8 years from the finalization of these rules, to review the current residual risk analysis and again perform a residual risk rulemaking once additional data on reference values become available.

Response: This issue was addressed by the SAB Panel in their May 10, 2010 response to the EPA Administrator.[27] In that response, the SAB Panel recommended that, for HAPs that do not have dose-response values from the EPA's hierarchy list, the EPA should consider and use, as appropriate, additional sources for such values that have undergone adequate and rigorous scientific peer review. They further recommended that the inclusion of additional sources of dose-response values into the EPA's hierarchy should be adequately documented in a transparent manner in any residual risk assessment case study. We agree with this approach and have considered other sources of dose-response data when conducting our risk determinations under RTR. However, in some instances, no sources of information in addition to the EPA's hierarchy are available.

The EPA agrees that we should ultimately develop toxicity values for all HAPs using all credible and relevant toxicity information. The need to update assessments with newly available data, as well as the need to complete toxicological assessments for all HAPs lacking dose-response assessments, further increases the importance of Agency activities to streamline and fully use the EPA's already overloaded IRIS program. To that end, the EPA has always prioritized for future IRIS assessments those HAP without dose-response values but with the greatest potential for public exposure. As a result of this prioritization, while not all HAPs may have scientifically accepted dose-response values that can be used in residual risk assessments, it is clear that the vast majority of HAPs which might carry the potential to significantly impact the results of residual risk assessments do, in fact, have credible dose-response values. Thus, while we are not yet at the point where all HAPs have dose-response values, we are generally capable of deriving reasonable risk estimates for those HAP which dominate the risks from any one source category. In the course of each residual risk assessment, should we encounter HAP

[27] See *SAB's Response to EPA's RTR Risk Assessment Methodologies* (EPA-SAB-10-007), available online at: *http://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/$File/EPA-SAB-10-007-unsigned.pdf*

without dose-response values which carry the potential to create significant risks, we shall clearly point those out as uncertainties and target them for future IRIS assessments. Moreover, as additional dose-response values become available, the EPA will incorporate these dose-response values into future risk assessments.

The dose-response values that were used in this risk assessment are based on the current peer reviewed IRIS values. At the time this analysis was performed, these values were deemed to represent the best science. Revised IRIS values were not available at the time the analysis was performed. We cannot pick and choose newly available values that have not gone through the IRIS (or other similarly accepted) review process. We cannot delay rules for new IRIS values that may be developed in the future; however, we can re-examine rules as new health information becomes available. Also, the commenter falsely assumes that all new IRIS dose-response values will be more stringent than the existing values. The new IRIS doses-response values could be less or more stringent, or equal to the existing values, depending on what the scientific data support.

The EPA disagrees that with the commenter that we did not state which HAPs currently have no reference value. Table 3.1-1 in the risk assessment document[28] lists all the HAP emitted by the source category, as well as whether there is an available cancer, chronic non-cancer, and/or acute dose-response value. Over 99.8 percent of the HAP emitted in this category has one or more of these reference values.

Regarding the commenter's suggestion that EPA must conduct another residual risk analysis no later than 8 years from the finalization of the subpart S amendments, CAA section 112(f)(2)(A) requires EPA to assess the remaining risk no later than 8 years after promulgation of the standards for each source category; additional assessments are neither stipulated or prohibited.

25. Comment: Arsenic. Commenter 0174 noted that the current unit risk estimate (URE) for chronic cancer risk for arsenic in the IRIS database is 0.0043 $\mu g/m^3$. The commenter stated that this risk factor was derived in the 1984 EPA Health Assessment Document (HAD) and is the basis of risk estimates in the HEM3 risk assessment model. During its reassessment of the North Carolina acceptable ambient level (AAL) for arsenic during 2011, the North Carolina Science Advisory Board for Toxic Air Pollutants (NCSAB) included updated epidemiological data[29] with additional person-years and NC-specific lung cancer mortality rates that alter the 1984 EPA risk estimate as a function of cumulative arsenic exposure. Additionally, there is better scientific understanding in 2012 compared to 1984 of the forms of arsenic involved in environmental exposures and differences between risk based on industrial health and environmental exposure

[28] See Table 3.1-1 of U.S. EPA's *Risk Assessment for the Pulp & Paper Source Category,* in the docket for the subpart S rulemaking.

[29] Lubin *et al*., Respiratory cancer in a cohort of copper smelter workers: results from more than 50 years of follow-up *Am J Epidemiol* 151:554–565 (2000); Lubin *et al.,* Respiratory Cancer and Inhaled Inorganic Arsenic in Copper Smelters Workers: A Linear Relationship with Cumulative Exposure that Increases with Concentration. *Environmental Health Perspectives* 116(12) (2008); Järup *et al.,* Cumulative arsenic exposure and lung cancer in smelter workers: A dose-response study. *Am. J. Ind. Med.* 15: 31-41 (1989); Viren & Silvers, Unit risk estimates for airborne arsenic exposure: an updated view based on recent data from two copper smelter cohorts." *Regul Toxicol Pharmacol* 20(2): 125-138 (1994).

studies. The NCSAB concluded that, based on current science, the 1984 URE for arsenic used by EPA is out–of-date and overestimates cancer risk by almost one order of magnitude. The NCSAB also concluded that the thresholds for non-cancer risks associated arsenic are higher than cancer risk threshold and that arsenic standards based on cancer risk are protective of all health risk.

Response: The EPA has a hierarchy of appropriate health benchmark values, and, in general, this hierarchy places greater weight on the EPA-derived health benchmarks than those from other agencies, including benchmarks developed by the NCSAB [30,31] We have a prioritization process aimed at incorporating into our assessments the best available science with respect to dose-response information. This information is obtained from various sources and prioritized according to (1) conceptual consistency with EPA risk assessment guidelines and (2) level of peer review received. Where we are lacking dose-response information with higher priority (e.g., IRIS), we use other information sources, such as the California Environmental Protection Agency (CalEPA). Notably, this hierarchy favoring EPA benchmarks (when they exist) over all others has been endorsed by the SAB:[32]

> "The Panel found EPA"s approach to selecting dose-response chronic toxicity values to be generally sound… The Panel supports the use of the Integrated Risk Information System (IRIS) as the preferred database for chronic dose-response data. The Panel also strongly recommends that EPA develop toxicity values for all HAP insofar as the data permit, and that it updates IRIS in a timelier manner." "The preferred database for chronic dose-response data is and should be the IRIS database. (p. 17)."

The URE value that was used in this risk assessment for arsenic is based on the current peer-reviewed IRIS assessment (published in 1998, not in 1984 as the commenter stated). At the time this analysis was performed, this value was deemed to represent the best available science. A revised IRIS value for arsenic was not available at the time the analysis was performed, and we cannot pick and choose newly available values that have not gone through the IRIS (or other similarly accepted) review process.

26. Comment: Acrolein. Commenter 0162 stated that the health effects caused by exposure to acrolein are overestimated in EPA's IRIS database. The commenter noted that, in 2007, the Hamner Institute completed a study of acrolein's health effects, which included 90-day animal/rat studies, as well as work on a computational fluid dynamic (CFD) model on uptake of acrolein to understand biological dose. According to the commenter, this research was then published in a peer-reviewed journal.[33] The commenter pointed out that on October 17, 2008, they sent a letter advising EPA of the new studies and in December 2010 asked EPA to update its

[30] See *Health Effects Information Used In Cancer and Noncancer Risk Characterization For the 1999 National-Scale Assessment*. Available online at: *http://www.epa.gov/ttn/atw/nata1999/99pdfs/healtheffectsinfo.pdf*.
[31] See http://daq.state.nc.us/toxics/risk/sab/ra/.
[32] See *SAB's Response to EPA's RTR Risk Assessment Methodologies* (EPA-SAB-10-007), available online at: *http://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/$File/EPA-SAB-10-007-unsigned.pdf*.
[33] Dorman, *et al.*, Respiratory Tract Responses in Male Rats Following Subchronic Acrolein Inhalation, *Inhalation Toxicology* 20:205-216 (2008). Schroeter *et al*., Application of Physiological Computational Fluid Dynamics Models to Predict Interspecies Nasal Dosimetry of Inhaled Acrolein, *Inhalation Toxicology* 20:227-243 (2008). Struve, *et al*., Nasal Uptake of Inhaled Acrolein in Rats, *Inhalation Toxicology* 20:217-225 (2008).

acrolein IRIS assessment and amend the risk value for acrolein using the Hamner studies. Before EPA estimates any risk from acrolein emissions, the commenter urged that the IRIS assessment on acrolein be revised to reflect the best available science.

Commenter 0162 acknowledged that the SAB Panel, in February 2010, supported the use of IRIS as the "preferred" database, but the commenter noted that the Panel also advised EPA to consider alternatives where the IRIS values are based on limited data. The commenter specifically cited the Panel's statement that it "found EPA's approach to selecting dose-response chronic toxicity values to be generally sound, but recommends the Agency more closely scrutinize values that emerge as drivers of risk assessment results."[34] The commenter included Table 4 below comparing the acrolein RfCs used by government organizations for risk analysis, which, according to the commenter, shows that EPA's current value for acrolein is not based on the best available scientific data and is more than 15 times more stringent than the RfCs established more recently by CalEPA and Ontario Ministry of the Environment (MOE).

Table 4. Comparison of Acrolein RfC Used by Various Government Organizations (Submitted by Commenter 0162)

Government Agency	Previous RfC (μg/m^3)	Recent RfC (μg/m^3)	Year of Recent RfC
EPA	0.02	0.02	2003
Hamner Institute	--	0.6	2008
CalEPA	0.06	0.35	2008
Ontario MOE	0.08	0.4	2009

Commenter 0162 noted that EPA's current RfC is based on a study by Feron (1978) that examined few animals, did not involve exposure concentrations low enough to develop a no observed adverse effect level (NOAEL)--(just a lowest observed adverse effect level (LOAEL)--and did not study nasal uptake/activity. According to the commenter, EPA has acknowledged the study was of poor quality and that large uncertainty factors were used (1000x). The commenter cited the following statement from EPA in a technical document regarding the use of health effects information in evaluating school air toxic monitoring results:

> The comparison level shown for acrolein is the EPA RfC which is set below a level associated with health effects. The RfC is set as a factor of 1000 below an exposure concentration associated with sensitive nasal effects in laboratory animals. Since the EPA RfC was derived, the California EPA (CalEPA) has derived a chronic REL[35] based on more recently available information on acrolein and its effects. The CalEPA REL, which is 0.35 μg/m^3, is somewhat more than a factor of 100 below the level associated with effects in the more recently available study.[36]

[34] See 5/7/10 letter from SAB Panel to EPA.

[35] REL refers to a Reference Exposure Level. "CalEPA defines the REL as a concentration level at (or below) which no health effects are anticipated, a concept that is substantially similar to EPA's noncancer dose- response assessment perspective." *http://www.epa.gov/ttn/atw/toxsource/chronicsources.html*

[36] Schools Air Toxic Monitoring Activity (2009) Uses of Health Effects Information in Evaluating Sample Results, 09/10/2009, EPA, *http://www.epa.gov/schoolair/pdfs/UsesOfHealthEffectsInfoinEvalSampleResults.pdf*

According to the commenter, the recommended value, based on the Hamner Institute study, is 30 times less stringent than what EPA is using (0.6 μg/m^3 (270 parts per trillion [ppt]) vs. 0.02 μg/m^3 (9 ppt)). The commenter noted that CalEPA (0.35 μg/m^3) and Ontario, Canada (0.4 μg/m^3) have set their RfCs at much less stringent levels. The commenter also noted that, in the technical document for interpretation of health effects surrounding schools, EPA referenced the values used by CalEPA and Ontario as more appropriate.

The commenter concluded that the alternative RfCs presented in the Hamner study are more scientifically valid than the EPA IRIS value and asserted that, when both the Hamner study RfC and industry emissions data for acrolein are applied, the analysis would not support a conclusion that there are any significant residual risks associated with acrolein emissions from the pulp and paper source category.

Commenters 0162 and 0196 agreed with the decision to remove acrolein emissions from the subpart S modeling files "due to the uncertainty in the emissions estimates" (76 FR 81334).[37] Commenter 0162 noted that acrolein is a very reactive gas and hard to measure at the parts per billion level of emissions. The commenter stated that the primary generators of acrolein emissions are fires and mobile sources, but that EPA has not regulated acrolein from mobile sources to date. The commenter said that the forest products industry is a very small contributor to ambient levels/loadings of acrolein because paper mill acrolein emissions would only be a fraction of the 1 percent emitted from boilers and process heaters, according to data from the 2005 National-Scale Air Toxics Assessment (NATA).

Response: We acknowledge the commenters' support for the conclusion regarding the uncertainty with acrolein emissions. Due to the removal of acrolein emissions from the subject source category, the applicability of the dose-response value used is not relevant for this rulemaking. Acrolein emissions were removed from the subpart S modeling file due to uncertainty in the emissions estimates.[38] The EPA is working with the industry to help improve the test methods for acrolein from non-combustion sources. Acrolein emissions were modeled for combustion sources in the facilitywide modeling performed for the subpart S RTR and will be included in future residual risk modeling efforts (e.g., for subpart MM). Emissions estimates will be updated prior to future residual risk modeling efforts based on additional information

[37] Commenter 0162 noted that EPA elaborated on the causes of this uncertainty in its memorandum included as Appendix H to the RTI memorandum entitled, "Inputs to the Pulp and Paper Industry October 2011 Residual Risk Modeling," located in the docket at EPA-HQ-OAR-2007-0544-0122. In the memo appendix, EPA explained that "in the case of acrolein from Subpart S non-combustion sources, this [EPA emission factor development] protocol results in emission factors based primarily on assumed ½-MDL values from a majority of test runs where acrolein was not detected which introduced a large number of unknowns into the dataset, thereby multiplying the uncertainties [in the source of acrolein emissions from non-combustion sources] outlined above to an unknown degree. The uncertainty in the initial data set is further magnified when the emission factors are applied across the industry, yielding a resultant acrolein emission inventory predicated primarily on assumed values and not actual emissions measurements. This magnified uncertainty is compounded with the additional uncertainty of acrolein emissions from different paper machine operating parameters and different wood species used in pulping, resulting in further exacerbation of the uncertainty." Inputs Memo p. H-2.

[38] For more information, see memorandum from T. Holloway, K. Hanks, C. Gooden, and M. Hakos, RTI, to J. Bradfield and B. Schrock, EPA, titled *Inputs to the Pulp and Paper Industry October 2011 Residual Risk Modeling*, November 11, 2011, in the docket for the subpart S rulemaking.

available at that time and the refinements to facilitywide emissions inventories received in response to EPA's December 2011 request for comments on the data set. (76 FR 81346-81351)

27. Comment: Formaldehyde. Three commenters (0162, 0196, and 0208) objected to EPA's use of the 1991 IRIS dose-response value in evaluating formaldehyde risk. Commenter 0208 urged EPA to revise the proposed rule to accurately convey the best available science and a weight-of-evidence approach in compliance with the Information Quality Act (IQA) Guidelines and Executive Order (EO) 13563. In particular, the commenter asserted that EPA should reject the 1991 IRIS dose-response value and incorporate the 1999 CIIT cancer dose-response value for formaldehyde.[39]

Commenter 0208 stated that the proposed rule is subject to EPA and Office of Management and Budget (OMB) IQA Guidelines. Congress enacted the IQA, Pub. L. No. 106-554, 114 Stat. 2763A-153 to 2763A-154, to "ensur[e,] and maximiz[e,] the quality, objectivity, utility and integrity of information … disseminated by Federal agencies" such as the EPA. In 2002, OMB issued its guidelines, and EPA issued its agency-specific guidelines (EPA IQA Guidelines) later that year.[40] The information that serves as the basis for EPA's proposed rule must meet OMB's guidelines as well as the Agency's own guidelines and must adhere to a rigorous standard of quality. The proposed rule is based on "influential" scientific risk assessment information as set forth in EPA IQA Guidelines[41] because it contains "information disseminated in support of top Agency actions (*i.e.*, rules…)" and is a "[m]ajor work product[]" that "will have … a clear and substantial impact (*i.e.*, potential change or effect) on important public policies or private sector decisions."[42] The substance of the information must be "accurate, reliable, and unbiased." EPA must use the best available science and supporting studies, as well as "a weight-of-evidence approach that considers all relevant information and its quality."[43]

Despite the numerous safeguards designed by OMB and EPA to ensure data quality, commenter 0208 argued that EPA has failed to rely on the best available science in developing the proposed rule. The EPA failed to comport with the IQA Guidelines in crafting the proposed rule. In particular, The EPA incorporated the 1991 IRIS dose-response model – an overly conservative and outdated model – for determining the level of risk presented by formaldehyde exposure and ignored, without any rationale, nearly 25 years of research. The commenter stated that the use of the IRIS model is all the more egregious considering the availability of the CIIT biologically-based dose-response (BBDR) model, which better reflects the available science.

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[39] Chemical Industry Institute of Toxicology (CIIT). 1999. *Formaldehyde: Hazard characterization and dose-response assessment for carcinogenicity by the route of inhalation* (revised ed.).

[40] OMB, Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies, 67 FR 8452 (Feb. 22, 2002) (OMB IQA Guidelines); see EPA, Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by the Environmental Protection Agency, available at *http://www.epa.gov/quality/informationguidelines/documents/EPA_InfoQualityGuidelines.pdf.*

[41] Pub. L. No. 106-554. The Information Quality Act was developed as a supplement to the Paperwork Reduction Act, 44 U.S.C. §3501 *et seq.*, which requires OMB, among other things, to "develop and oversee the implementation of policies, principles, standards, and guidelines to … apply to Federal agency dissemination of public information."

[42] EPA IQA Guidelines at 19-20 (internal citations omitted); OMB IQA Guidelines at 8455.

[43] EPA IQA Guidelines at 21.

Commenter 0208 further stated that, contrary to IQA guidelines, EPA inappropriately applied the outdated IRIS dose-response values in determining formaldehyde inhalation exposure risk in support of the proposed rule. In 2004, EPA determined that "the [formaldehyde] dose-response value in IRIS is based on a 1987 study, and no longer represents the best available science in the peer reviewed literature." 69 FR 18327, 18333 (Apr. 7, 2004). In this same determination, EPA went on to state the CIIT dose-response value was the most appropriate substitute. This determination led to the incorporation of the CIIT dose-response value for formaldehyde exposure in risk assessments supporting regulatory action. The commenter then highlighted EPA's decision to use the IRIS value instead of CIIT dose-response in the proposed rule, following the recommendations of the NAS review (76 FR 81335).

Commenter 0208 stated the NAS panel was highly critical of EPA's 2010 Draft IRIS Toxicological Review of Formaldehyde Inhalation Assessment,[44] and specifically supported the use of the CIIT BBDR model. (See NAS Report at 34-44.) In fact, the panel concluded that "the BBDR model for formaldehyde is one of the best-developed BBDR models to date" and specifically recommended that "EPA use the BBDR model for formaldehyde in its cancer assessment, compare the results with those described in the draft assessment, and discuss the strengths and weaknesses of each approach." (See NAS Report at 5.)

Commenter 0208 noted that in 2010, EPA rejected the BBDR model because it asserted that the variability of the model is "not supportive of interpreting the CIIT model results as providing a conservative (health-protective) estimate of human risk." (See 75 FR 80220, 80228 (Dec. 21, 2010) (citing Crump *et al.*, 2008).)[45] However, the sensitivity of the model had been questioned based on inappropriate manipulation. As explained by Conolly *et al.* (2009), while it is important to ensure that the BBDR model is "health protective" in its estimation of cancer risk by performing a sensitivity analysis, such an analysis is only valuable if it is constrained by respect for the biological realism of the model-predicted behavior. The NAS panel agreed (see NAS Report at 5, see also *id.* at 42).

Commenter 0208 stated the 1991 IRIS value does not constitute the best available science and therefore should not be used in determining formaldehyde inhalation exposure risk in support of the Proposed Rule. The BBDR model, which incorporates over 20 years of research to help characterize the roles of regenerative cellular proliferation (RCP) and DNA-protein cross-link (DPX) formation in formaldehyde carcinogenicity (see CIIT, 1999; NAS Report at 35), is a superior model for determining the cancer risk associated with formaldehyde exposure. The NAS panel concluded that "…The scope of the research makes this one of the best-developed BBDR models to date for any chemical, even with acknowledged uncertainties." (See NAS Report at 42.)

Furthermore, starting with biological data and a bottom-up linear extrapolation model using EPA's assumptions, Swenberg *et al.* (2010) report, at S136-S137:

[44] National Research Council of the National Academies, *Review of the Environmental Protection Agency's Draft IRIS Assessment of Formaldehyde* (2011) (NAS Report).

[45] Crump, K.S.; Chen, C.; Fox, J.F.; Van Landingham, C.; Subramaniam, R. 2008. Sensitivity Analysis of Biologically Motivated Model for Formaldehyde-Induced Respiratory Cancer in Humans. *Ann. Occup. Hyg.* 52:481-495.

> Our estimates of HL [Hodgkin lymphoma] and LEU [leukemia] risk diverge even more dramatically from the corresponding U.S. EPA estimates....The marked disparities between the adduct-based and epidemiology-based cancer risk estimates for distant sites suggest strongly that the excess risks of HL and NPC [nasopharyngeal cancer] that have been reported in association with occupational formaldehyde exposures cannot be due to formaldehyde…. Comparison of our risk estimates with corresponding estimates from the U.S. EPA draft document shows the latter to be markedly higher. This discrepancy between results obtained with molecular dosimetry and those that rely on highly uncertain retrospective exposure reconstructions calls into serious question the credibility of attributing increased human mortality from these cancers, particularly at distant sites, to occupational formaldehyde exposures.[46]

Commenter 0208 recommended that the NAS report should be used in determining what constitutes the best available science. The commenter stated that the deference given to the 1991 IRIS Assessment is directly at odds with EPA's mandate to "consider all credible and relevant information" in a rulemaking proceeding. The commenter noted that EPA has repeatedly emphasized that the Agency is required to consider other information, in addition to the IRIS database, when evaluating health effects in a regulatory context.[47] In guidance on the use of IRIS for purposes of developing values under the early reduction program of the CAA, EPA noted: [48]

> It is also important to remember that IRIS is not a comprehensive toxicological database. There may be more recent information available than is contained in IRIS. Moreover, the act of including a value in IRIS is not subject to notice and comment rulemaking, and may not necessarily have been subjected to external peer review…. Accordingly, IRIS values are not entitled to conclusive weight and shall not be made legally binding in the context of any other rulemaking action. In addition, EPA or any State agency that uses IRIS should not rely exclusively on IRIS values but should consider all credible and relevant information that is submitted in any particular rulemaking. If an outside party questions IRIS values during the course of an EPA proceeding…, EPA will consider all credible and relevant information before it in that proceeding.

Commenter 0208 recognized the importance of considering all recent and relevant information instead of simply using IRIS assessment values as default values in Agency actions, which is echoed in an EPA Office of Solid Waste and Emergency Response (OSWER) directive.[49] The need for careful examination of this information is also quite evident in the case of the formaldehyde dose-response value where the IRIS dose-response value is based on a study that is over 20 years old. This fact was emphasized in the 2004 proposed rule for the NESHAP for stationary combustion turbines, 40 CFR part 63, where, in its discussion of the formaldehyde

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[46] Swenberg, J.A.; Lu, K.; Moeller, B.; Gao, L.; Upton, P.; Nakamura, J.; Starr, T. 2010. Endogenous versus Exogenous DNA Adducts: Their Role in Carcinogenesis, Epidemiology, and Risk Assessment. *Toxicol. Sci.* 120(S1):S130-S145.

[47] *See Community Nutrition Instit. v. Young,* 818 F.2d 943, 946 (D.C. Cir. 1987), *McLoud Steel Prods. Corp. v. EPA*, 838 F.2d 1317 (D.C. Cir. 1988); *see also* EPA, *Residual Risk Report to Congress*, EPA-453/R-99-001 (Mar. 1999), at 61 ("As the IRIS assessments for some HAPs are less current than others, the Agency will evaluate the appropriateness of some assessments in light of more recent credible and relevant information.").

[48] U.S. EPA, *Guidance on Use of Integrated Risk Information System (IRIS) Values*, Office of Air Quality Planning and Standards (1994).

[49] U.S. EPA, *Use of IRIS Values in Superfund Risk Assessment*, OSWER Directive No. 9285.7-16 (1993).

dose-response value, EPA stated that "the dose-response value in IRIS is based on a 1987 study, and no longer represents the best available science in the peer reviewed literature. Since that time significant new data and analysis has become available." (See 69 FR 18333.) The commenter stated that the NAS panel's unequivocal support of the CIIT BBDR model should be considered when determining the best available science.

Commenter 0208 stated EPA's proposed rule should be based on the best available science *at the time* of the rulemaking. The EPA's reversion to the 1991 IRIS assessment value for use in the proposed rule not only violates its own guidance on the use of IRIS for purposes of developing toxicological values, but also fails to meet the rigorous data quality standards for "influential information" outlined in the IQA Guidelines. To determine what constitutes the "best available science," the EPA is required to conduct a comprehensive review of the available science, and make a determination based on the weight-of-evidence. The EPA overly simplified this process by determining that the only two viable dose-response values were the CIIT value and the 1991 IRIS value. The EPA defaulted to the 1991 IRIS value without conducting a comprehensive review of the considerable body of research that has been conducted in the past 20 years that may suggest an alternative value that is supported by the best available science.

Commenter 0208 noted that the U.S. Court of Appeals for the D.C. Circuit, in *Chlorine Chemistry Council v. EPA*, 206 F.3d 1286 (D.C. Cir. 2000), further underscored the importance of rulemaking "on the basis of the best available science *at the time* of the rulemaking." (See *id.* at 1291 (emphasis in original).) In holding that the best available science is the science available at the time of rulemaking, the D.C. Circuit Court unanimously rejected EPA's contention that it would defer the application of the best available science until after input from the SAB on the carcinogenic mode of action of chloroform. "The word 'available' would be senseless if construed to mean 'expected to be available at some future date.'" (See *id.)* Similarly, the research and data considered in the NAS Report of the Draft IRIS Assessment must be incorporated into this rulemaking; the EPA cannot legally defer application of the best available science.

Commenter 0162 attached comments from commenter 0208 (Formaldehyde Panel for the American Chemistry Council) to their public comments and cited commenter 0208's statement that "the EPA has failed to support key conclusions . . . with the best available science"[50] in evaluating the potential impacts from formaldehyde emissions. Commenter 0162 also cited commenter 0208's statements regarding EPA's "egregious" use of the 1991 IRIS dose-response model instead of the CIIT BBDR model, which commenter 0162 said better reflects the available science[51] and is supported in the April 2011 NAS Report of its review of formaldehyde risk.[52] Commenter 0162 concluded that EPA is relying on an inferior model to support its impact analysis of formaldehyde emissions from pulp and paper mills. According to commenter 0162, EPA inappropriately applied the outdated IRIS dose-response values in determining formaldehyde inhalation exposure risk in support of the proposed rule, contrary to IQA

[50] Comments from the Formaldehyde Panel for the American Chemistry Council in Response to EPA's Proposed NESHAP from Pulp and Paper Industry (Docket No. EPA-HQ-OAR-2007-0544-0208.); 2/27/12
[51] *Id.*
[52] National Research Council of the National Academies, *Review of the Environmental Protection Agency's Draft IRIS Assessment of Formaldehyde* (2011) (NAS Report), available at *http://www.nap.edu/catalog.php?record id=13142*.

Guidelines. Commenter 0162 argued that the 1991 IRIS model does not constitute the best available science and, therefore, should not be used in determining formaldehyde inhalation exposure risk in support of the proposed rule. The commenter stated that CIIT's BBDR model is a superior model for determining the cancer risk associated with formaldehyde exposure and argued that EPA overstated the variability associated with CIIT's model and based its view on inappropriate manipulations of the model's underlying assumptions. The commenter asserted that the deference given to the 1991 IRIS Assessment was directly at odds with EPA's mandate to "consider all credible and relevant information" in a rulemaking proceeding and pointed out that EPA's proposed rule should be based on the best available science at the time of the rulemaking."[53]

Commenter 0196 attached comments from the Formaldehyde Panel that were provided in response to EPA's proposed NESHAP for wood furniture manufacturing operations (Docket No. EPA-HQ-OAR-2010-0786)[54], which were identical to the comments presented above, and concluded that EPA has repeated the same fundamental mistakes in the pulp and paper proposal. Commenter 0196 stated that EPA should follow NAS's recommendation to use the "best available science" by applying the CIIT dose-response value rather than the outdated IRIS value.

Response: In 2004, the EPA determined that the CIIT cancer dose-response value for formaldehyde (5.5 E-9 $\mu g/m^3$) was based on better science than the IRIS cancer dose-response value (1.3 E-5 $\mu g/m^3$), and we switched from using the IRIS value to the CIIT value in risk assessments supporting regulatory actions. Subsequent research published by EPA suggested that the CIIT model was not appropriate, and in 2010 EPA returned to using the 1991 IRIS value. The EPA has been working on revising the formaldehyde IRIS assessment, and the NAS completed its review of the EPA's draft assessment in April of 2011.[55] The EPA will follow the NAS Report recommendations and will present results obtained by implementing the BBDR model for formaldehyde. The EPA will compare these estimates with those currently presented in the External Review draft of the assessment and will discuss their strengths and weaknesses. As recommended by the NAS committee, appropriate sensitivity and uncertainty analyses will be an integral component of implementing the BBDR model. In the interim, we will present findings using the 1991 IRIS value as a primary estimate, and EPA may also consider other information as the science evolves. We should note that adequately judging all of the data is the goal of this process, and mere substitution of another model with its own set of critical uncertainties should not be adopted without a full vetting, which is the process currently under way in the process of revising the IRIS value for formaldehyde.

Contrary to what commenter 0208 states, the NAS did not make any recommendations on which values should be used in regulatory decisions, but did recommend that EPA consider all credible and relevant information in developing its hazard assessment in the IRIS process. Inclusion of all credible and relevant information is best done within the revised IRIS process,

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[53] Comments from the Formaldehyde Panel of the American Chemistry Council in Response to EPA's Proposed NESHAP from Pulp and Paper Industry, Attachment 2.

[54] Comments from the Formaldehyde Panel for the American Chemistry Council in response to EPA's Proposed NESHAP for Wood Furniture Manufacturing Operations (Docket No. EPA-HQ-OAR-2010-0786).

[55] National Research Council of the National Academies, *Review of the Environmental Protection Agency's Draft IRIS Assessment of Formaldehyde* (2011) (NAS Report), available at *http://www.nap.edu/catalog.php?record id=13142*.

which is informed by the NAS report. To circumvent that process for any specific context is likely to result in a less robust estimate of potential risk.

28. Comment: Lead. Commenter 0218 stated that there is no reference concentration for, or any safe level of exposure to, lead. The EPA assessed risk for lead by reference to the 2008 NAAQS for lead, which the commenter did not believe was protective enough. The commenter, stated the EPA may not assume that what is "adequate" under section 109 is the same as what is "acceptable," and EPA must independently determine under section 112 what is needed to provide an "ample margin of safety to protect health." The commenter noted differences between section 109 and section 112 assessments:

- The NAAQS was created to protect the average exposed member of the population from an IQ point loss above 2 points, not to protect the "most exposed" and most vulnerable member of that population who may experience greater harm at each level of exposure;
- The lead NAAQS was also designed to address only a single pollutant (elemental lead), while section 112(f)(2) requires EPA to assess and address health risk from lead compounds and from the *combined* effect of a source category's HAP emissions on the most exposed person;
- There is significant new information since the scientific review closed on the NAAQS, suggesting that a stronger standard is needed (the commenter cited five documents from OEHHA, New York City (NYC) Department of Public Hygiene, Centers for Disease Control and Prevention (CDC), and CalEPA as references, and attached four of the documents); and
- Lead can interact with other pollutants, such as arsenic, to cause greater harm than lead exposure alone.

The commenter stated that section 112(f)(2) requires EPA to create an "ample margin of safety to protect public health," while the NAAQS must only satisfy the test to provide an "adequate margin of safety." The commenter asserted that rather than relying only on the NAAQS to assess health risk from lead, EPA should use all of the best available, most current information, including California's lead health benchmark – which recognizes that action is needed to protect children from a blood-lead level increase of 1.0 micrograms per deciliter (μg/dL) – as part of its analysis of health risk for lead.

Response: We recognize, as the commenter noted, that there is no RfC for lead. Nonetheless, it should also be noted that lead compounds are a minor HAP in this source category. Emission inventories indicate lead compounds are 0.0001 percent of HAP emissions.[56] Lead emissions are generally below testing detection levels at category emission sources. Reported inventory estimates, when present, are generally derived from extrapolations based on the small quantity of naturally-occurring lead found in the wood raw material. We assert that it is appropriate here to use the lead NAAQS as a basis for determining risk under an ample margin of safety analysis. In this circumstance, the small quantity of lead emissions in the category results in exposure levels well below the NAAQS. As a result of our ample margin of safety

[56] See memorandum from T. Holloway, K. Hanks, C. Gooden, and M. Hakos, RTI, to J. Bradfield and B. Schrock, EPA, titled *Inputs to the Pulp and Paper Industry October 2011 Residual Risk Modeling*, Table 6B, November 11, 2011, in the docket for the subpart S rulemaking.

analysis, EPA found the risk from lead and other HAP emissions in this category to be acceptable.

So, in order to assess multipathway risks associated with emissions of lead, the EPA compared lead emissions from this category to the NAAQS for lead. As noted in the primary and secondary lead RTR rules (76 FR 70834 and 77 FR 556), we contend that this is a reasonable approach, given that the NAAQS is a health-based standard set to protect the public health, including the health of sensitive sub-populations with an adequate margin of safety. Moreover, the NAAQS for lead specifically is targeted to provide requisite protection with an adequate margin of safety to prevent neurologic effects to children with low blood lead levels living near a lead source and exposed at the level of the NAAQS. Also, the risk assessment supporting the NAAQS considered direct inhalation exposures and indirect air-related multipathway exposures from industrial sources like pulp and papermaking operations. While we conclude that the NAAQS presents an acceptable level of risk from lead in ambient air, as part of our "ample margin of safety" analysis, we examined whether there were additional cost-effective controls available to further protect public health. For the reasons explained in the proposal and other supporting documents available in the docket, we have determined that there are no additional cost-effective, technically feasible controls that would provide further risk reductions.

With respect to the benchmarks from OEHHA, NYC Department of Public Hygiene, CDC, and CalEPA for protecting children, the EPA has a hierarchy of appropriate health benchmark values. In general, this hierarchy places greater weight on EPA-derived health benchmarks than those from other agencies.[57] For further information on EPA responses regarding lead, please refer to the Response to Comment Document for the Secondary Lead Smelting Source Category; this document will be included in the docket for the pulp and paper rule.

2.3 Uncertainties in Risk Assessment

29. Comment: Commenter 0161.1 believes that the methodology used to determine the inhalation exposure risk from HAPs is not a conservative assessment. The commenter questioned using the centroid, instead of the maximum exposed individual or property line, to estimate MIR. The commenter argued that the HEM3 model should include building downwash parameters. Because these were not included, the commenter contended that ambient concentrations were underestimated. The commenter stated that all RTR assessments should include 2010 census data instead of 2000 census data and provided an example to display the differences in the data for one location.

Response: We disagree that our modeling methodologies result in significant underestimates of concentrations and risks. Our dispersion model methodologies were reviewed by SAB as part of their overall review of RTR risk assessment methodologies, and their review

[57] See *Health Effects Information Used In Cancer and Noncancer Risk Characterization For the 1999 National-Scale Assessment*. Available online at:*http://www.epa.gov/ttn/atw/nata1999/99pdfs/healtheffectsinfo.pdf.*

stated that "…the dispersion modeling for primary HAPs used in risk assessments is well developed and appropriate."[58]

As we have noted in the development of previous residual risk regulations, such as the HON, in a national-scale assessment of lifetime inhalation exposures and health risks from facilities in a source category, it is appropriate to identify exposure locations where it may be reasonably expected that an individual will spend a majority of his or her lifetime. Further, in determining chronic risks, it is appropriate to use census block information on where people actually reside, rather than points on a fence line, to locate the estimation of exposures and risks to individuals living near such facilities. Census blocks are the finest resolution available as part of the nationwide population data (as developed by the U.S. Census Bureau); each is typically comprised of approximately 40 people or about 10 households. In EPA risk assessments, the geographic centroid of each census block containing at least one person is used to represent the location where all the people in that census block live. The census block centroid with the highest estimated exposure then becomes the location of maximum exposure, and the entire population of that census block is assumed to experience the maximum individual risk. In some cases, because actual residence locations may be closer to or farther from facility emission points, this may result in an overestimate or underestimate of the actual annual concentrations (although there is no systematic bias for average levels).

Given the relatively small dimensions of census blocks in densely-populated areas, there is little uncertainty introduced by using the census block centroids. There is more uncertainty when census blocks are larger, although there is still no systematic bias. Thus, the EPA concludes that the most appropriate locations at which to estimate chronic exposures and risks are the census block centroids because: (1) census blocks are the finest resolution available in the national census data; (2) facility fence lines do not typically represent locations where chronic exposures are likely (*i.e.*, people do not typically live at the fence line of facilities); and (3) as described above, there is no systematic bias with respect to using census block centroids as an exposure surrogate for all individuals residing in that block.

As discussed in another comment response in this document, to reduce the uncertainties in estimating risks for census blocks with centroids located within facility boundaries, we relocated centroids to locations that better represent the residences in the block. Also, where blocks were large, we added receptors because the block centroid locations may not represent the highest exposures.The commenter is correct that EPA did not use the 2010 census blocks as receptors in the modeling of this source category. At the time of modeling, the 2010 census data were not fully available and verified to ensure an accurate location of the modeled population receptors. The 2010 data are available now, and we have used them in the modeling of several source categories. Future risk analyses will incorporate the 2010 census data.

We agree with the commenter that, in certain cases, building downwash can result in higher estimated air concentrations near buildings (typically up to five to ten building heights away), and that this is one area of uncertainty in our risk assessment. However, EPA does not

[58] US EPA, 2010. SAB's Response to EPA's RTR Risk Assessment Methodologies. *http://yosemite.epa.gov/sab/sabproduct.nsf/4AB3966E263D943A8525771F00668381/$File/EPA-SAB-10-007-unsigned.pdf*

expect the impact of downwash on maximum estimated exposures and risks to be significant, because the plumes from the stacks are emitted near ground level (stack heights less than 10 meters [m]). The effects of downwash are most significant with taller stacks because the higher plume is brought to the ground nearer the source, with much less space in which to disperse before reaching the ground than without downwash, leading to higher ground-level concentrations. Downwash likely would not have a significant impact on cancer incidence and population risks because those are driven by receptors farther from the source. Finally, the detailed building information required to model building downwash is usually not available for most sources.

30. Comment: Commenter 0218 supported EPA's decision to collect and review actual emission test data from this source category for this rulemaking using its CAA section 114 authority. The commenter believes that it is unclear whether EPA's data set is actually representative of emissions, because although it appears to include some test data, it also uses estimates. The EPA must provide the HAP emissions inventory with the emission totals of each HAP for each facility, and state whether this came from test data or estimates. Failing to include this makes it difficult for the public to review EPA's data, which is the primary basis for EPA's proposed rule.

Response: The data set used to model emissions was representative of pulp and paper industry emissions. We described the NEI data set used for risk modeling in section III.A.1 of the preamble to the proposed rule (see 76 FR 81333-81334). The actual annual emissions data in the NEI database were based on data from actual emissions tests and estimates of actual emissions (based on emission factors) provided by subpart S sources surveyed in Part II of the 2011 pulp and paper ICR. Two substantial QA efforts were conducted on the Part II data in order to create the modeling files needed for the residual risk assessment. Most emissions factors were based on actual tests or actual tests conducted at similar sources. Additionally, the largest HAP emission compound in the category, methanol, at approximately 86 percent of the HAP in the category, is required to be quantified in each compliance test referenced in the standard. Consequently, the greatest proportion of HAP emissions at each facility are based on emission factors derived from actual source-specific tests.

31. Comment: Commenter 0218 claimed that the EPA underestimated the total risk that maximum exposed people face due to emissions from the pulp and paper source category; the increased risk caused by a person's exposure to multiple types of HAP; or the baseline level of exposure.

The commenter argued that uncertainty is not a rational explanation for failing to address this important element of health risk. Where public health is concerned, the commenter asserted, uncertainties require more conservative assessment and more protective action, rather than inaction; the EPA must, at minimum, use an uncertainty factor to account for the greater health risk, and the EPA must also follow the SAB recommendations to perform a sensitivity analysis to identify the major uncertainties in both the human health and ecological risk assessments, explain the uncertainties, and take steps to reduce them.

Response: With respect to developing an upper-bound uncertainty factor to account for background contribution or synergistic effects, we expect that this would bias the uncertainty in

the risk assessment even higher. Please refer to section 4 of the risk assessment report[59] for more detailed discussions regarding the uncertainties for this risk assessment.

2.4 Risk Assessment Results

32. Comment: Multiple commenters (0162, 0163, 0165, 0167, 0173, 0196, and 0212) supported EPA's conclusion in the preamble to the proposed rule that "the current standard, before the amendments proposed here are put in place, protects public health with an ample margin of safety" (76 FR 81344). Commenter 0165 agreed with the EPA's conclusion that the in-force MACT has worked and there is no risk, Commenters 0163 and 0167 agreed with EPA's conclusion that there is no need for revised or additional MACT to address residual risk under this NESHAP. Commenter 0196 asserted that no further emissions reductions are needed to ensure protection of public health with an ample margin of safety.

Commenters 0163 and 0167 noted that the EPA made its conclusion whether considering their estimate of MACT allowable (*i.e.*, worst-case) emissions or their estimate of actual emissions. The two commenters (0163 and 0167) contended that the EPA's low-risk conclusion is understated because the risks probably are even less than EPA described; commenter 0163 noted that MACT allowable emissions are typically substantially greater than actual emissions for a complying facility. Commenter 0172 argued that the estimated acceptable risks are overstated due to the use of conservative health benchmarks, inappropriate modeling assumptions, and overestimates of emissions and stated that, as a result, EPA's conclusion that no further controls are needed is well founded.

Commenter 0162 noted that the modeled risk results were based on data supplied by 171 mills during the ICR in 2011. Commenter 0162 stated that the data collected comprised a comprehensive data set, reflecting the most up-to-date information and estimated that the industry spent over $5 million to respond to the ICR, not including the cost for the original collection of the data that were included in the survey. According to commenter 0162, the results of the analysis conducted by EPA show that the NESHAP subpart S rule was successful (*i.e.*, that MACT worked). The commenter said that this success was due to many factors, including the approximately $1.0 billion dollars[60] spent by the industry to achieve the emission reductions realized by the rule.

Response: We acknowledge the commenters' support for our risk assessment conclusion that the current subpart S NESHAP protects public health with an ample margin of safety.

33. Comment: Commenter 0174 noted that the meteorological data used in the HEM3 model is not representative of the Blue Ridge Paper Products Inc. site-specific meteorological data. The data input to the model was from a local regional airport. Due to the complex terrain in the region, the commenter asserted that their site-specific meteorological data should be used. The company provided site-specific data that is used by the North Carolina Division of Air Quality and EPA Region IV for modeling. The commenter provided specific data in their comment

[59] See U.S. EPA's *Risk Assessment for the Pulp & Paper Source Category*, in the docket for the subpart S rulemaking.
[60] NCASI estimate for implementation of subpart S and subpart MM. Majority of the capital cost was for subpart S.

attachment and stated that the updated data showed a 60 percent decrease in HEM3 modeled risk.

Response: The meteorological data set that was used in the pre-proposal modeling for this facility was the only data available to EPA at the time the modeling was conducted. We appreciate the commenter providing the meteorological data for remodeling risk for their facility post-proposal. However, as discussed in the paragraph below (and in section 2.1.2), the EPA has decided not to remodel risk for the pulp and paper source category.

At proposal, the EPA found the risk at each of the facilities in the source category to be acceptable under an ample margin of safety, and the post-proposal NEI data revisions provided by the industry (including this facility) will most likely adjust the risk results for the source category downward (*i.e.*, reduce risk), based on our review of the data revisions. Because of this, the EPA has elected not to remodel risk for purposes of promulgating of the subpart S residual risk review, but instead to rely on the conclusions from the risk modeling conducted for the proposed rule. However, the meteorological data and comments provided by the commenter will be made a part of the public record in the docket for the subpart S rulemaking, along with documentation supporting the EPA's decision not to remodel risk.[61]

34. Comment: According to commenter 0162, their consultant (hereafter referred to with commenter 0162 as "the commenter") found the following errors in model input parameters among the mills with higher modeled risk.[62] The commenter expected that these types of errors are common among all of the mills and thereby likely contribute to a general overestimation of modeled risk from this industrial sector.

The commenter found that, in EPA's refined assessment of the acute risk of subpart S sources, 11 HAPs and 9 mills had modeled maximum acute HQs of 1.5 and greater. Among these mills, the commenter determined that more than one-third (4 of 9) have impacts that are dominated by modeled wastewater treatment area sources that are incorrectly located.

According to the commenter, EPA's assessment of the potential health effects due to long-term inhalation exposure from subpart S sources showed 42 mills had a modeled maximum individual lifetime cancer risk of 2 in a million or greater. The commenter found that predicted hazard indices for all mills were less than 1 for subpart S sources. For the 42 mills, the commenter made the following observations:

- The commenter found that risks at more than 64 percent of these mills (27 of 42) are primarily associated with emissions from mill sources characterized as area sources, simplistically representing a large number of discrete emission sources. According to the commenter, in dispersion modeling, it is commonly found that a more detailed source characterization materially reduces modeled concentrations and associated modeled maximum off-site risk. The commenter indicated that this is largely because modeling as

[61] See memorandum from T. Holloway, RTI, to J. Bradfield, B. Schrock, K. Spence, and N. Swanson, EPA. *Recommendations Concerning Residual Risk Remodeling for the Pulp and Paper Industry,* May 8, 2012, in the docket for the subpart S rulemaking.

[62] See Attachment 1, "Review of HEM Modeling Conducted by EPA for the Pulp and Paper Industry RTR," AECOM, February 2012.

area sources inherently assumes that all emissions in the area are released at a single height and no credit is given for plume rise associated with individual point sources.

- The commenter found that about 17 percent of the mills (7 of 42) were characterized as single point emission sources or with consolidated releases emitted from only a few points. According to the commenter, this simplistic method insufficiently characterized the spatial distribution of source emissions at the mill, and would be expected to result in overestimates of off-site concentrations and associated risk.

- The commenter found that about 26 percent of the mills (11 of 42) had incorrectly located one or more of the sources that contributed substantially to the modeled risk. The commenter expected that more accurately locating these sources would result in lower modeled risk.

- The commenter found that 3 of the 42 mills had maximum modeled risk at a population-based receptor that was erroneously placed in an uninhabited and inaccessible location close to a major emissions source.

- The commenter found that about 26 percent of the mills (11 of 42) had erroneously calculated emissions, input the total facility emissions for a category into multiple sources rather than the contribution of each source, or used an emission factor based on questionable data. The commenter expected that more accurately locating these sources would result in lower modeled risk.

- The commenter found that about 19 percent of the mills (8 of 42) had characterized sources with very low or default fugitive release heights. According to the commenter, this simplistic method insufficiently characterized the dispersion of these source emissions at the mill, and would be expected to result in overestimates of off-site concentrations and associated risk.

The commenter also noted that, for several mills, the input data used in EPA's risk assessment were incorrect and indicated that those mills intend to submit corrected or updated data to EPA. The commenter included the following examples of data corrections:

- The commenter found that HEM input data were off several orders of magnitude, due to either mistakes in the NEI submittals or transcription errors from the NEI to the HEM model.
- The commenter found that some facilities did not submit an updated NEI to EPA based on revised bleached paper machine emission factor data issued by NCASI in late June 2011.
- The commenter found that unrepresentative meteorological data were used in the HEM assessment.

Based on the findings highlighted above and discussions with facility personnel, the commenter expected that the HEM risk results reported by EPA are in general higher than the actual risk for the industry that would be modeled if appropriate modeling refinements and corrections were made. The commenter pointed out that, even with these errors, EPA determined that the remaining residual risk levels were acceptable. As a result, the commenter realized that

EPA may decide it is not necessary to rerun the HEM model and update the risk assessment at this time. The commenter wanted to note, however, that the correction of the identified errors would result in lower estimated risks for pulp and paper mills at current emission rates.

Response: Most of the comments provided pertain to mischaracterizations of emissions and release parameters by industry. The EPA contends that the data provided for the modeling run were of sufficient accuracy to characterize the risk for the source category. We received a number of post-proposal NEI data revisions from the pulp and paper industry that address the commenter's concerns about errors in model input parameters, as summarized in the paragraphs below.

Of the mills with maximum acute HQs of 1.5 and greater, there were 3 mills that commented about the incorrect location of receptors, a fourth that requested a change to the fugitive angle for their wastewater treatment source, and a fifth that submitted latitude/longitude corrections for their wastewater treatment source.

Of the 42 mills with a maximum individual lifetime cancer risk of 2 in a million or greater that provided post-proposal NEI data revisions, there were 8 mills that revised the emissions release point type from "fugitive" to "stack" for various sources at the mills (*e.g.*, papermaking, pulping, causticizing) and 4 additional mills that replaced their paper machine records with new records to account for stack emissions, wet/dry end emissions, all vents on the machine, *etc.* There were 12 mills that corrected the latitude/longitude values for their paper machines, wastewater treatment sources, pulping sources, and causticizing sources and 10 mills that requested changes to receptor locations. There were 26 mills that either reduced emissions (*e.g.*, based on updated/corrected emission factors) or deleted pollutants (*e.g.*, deleting HCE from bleaching/washing in accordance with NCASI guidance, deleting organic pollutants not expected from causticizing systems using fresh water). There were also 7 mills that increased the stack height for some of their sources when they changed the release point type for those sources from "fugitive" to "stack."

Following the review of the NEI data revisions, a determination was made on a mill-by-mill basis whether risk remodeling was needed for a particular mill (*i.e.*, whether the NEI revisions would influence the outcome of the proposed risk assessment results). This determination was premised on the finding in the December 27, 2011 subpart S proposal that the risks from the pulp and paper source category are acceptable, and the current standard protects public health with an ample margin of safety. Therefore, as long as the risk for an individual mill would not be expected to increase substantially as a result of the mill's NEI data revisions, remodeling was not recommended for that mill.

Based on our review, we have concluded that the results of remodeling risk would most likely adjust the risk results for the subpart S source category downward (*i.e.*, reduce risk). Nearly all of the mills that submitted NEI data revisions appear to have reduced their risk by reducing emissions, changing emission release point type from fugitive to stack, and/or changing stack/fugitive parameters, among other changes. For the few mills that increased emissions with their NEI data revisions, the mills already had chronic cancer risks at or below 1 in a million and acute non-cancer risks below 1, and any increase in risk was expected to be minimal. For the several mills that made parameter changes that could potentially increase risk, any increase in

risk was countered by other changes that could reduce risk (*e.g.*, making other parameter changes, changing release point type from fugitive to stack, and/or reducing emissions), and the mills already had chronic cancer risks below 1 in a million, acute cancer risks below 1, and no increase in emissions of risk driver pollutants for their subpart S processes.

Based on these findings, EPA has elected not to remodel risk for purposes of promulgating of the subpart S residual risk review, but instead to rely on the conclusions from the risk modeling conducted for the proposed rule. A memo for the docket has been prepared summarizing the NEI revisions, noting their likely effect on risk, and documenting the recommendation not to remodel risk.[63]

35. Comment: Commenter 0218 declared that the EPA failed to assess or account for the increased exposure and vulnerability of children and pregnant women. The commenter observed that biological differences in the developing child and fetus can result in increased cancer and non-cancer risk due to both increased exposure and increased vulnerability, and emphasized that the EPA must account for the increased susceptibility of children to HAP emissions from this source category in the risk assessment. The commenter stated that the most recent review of EPA risk assessment practices by the NAS explicitly advised EPA to include *in utero* exposures as a period of increased sensitivity to carcinogens, and the commenter cited evidence from the most recent California draft risk assessment guidelines recommending assessment of health risk due to breast milk exposure as well as dermal and other ingestion exposures. The commenter noted that studies indicate increased risk from early life exposures for carcinogens not acting by a mutagenic mode of action and increased susceptibility during early life exposures for non-cancer effects, where physiological differences in the developing organism result in increased risks.

Commenter 0218 listed seven HAPs (formaldehyde, benzene, methylene chloride, POM, hexavalent chromium, arsenic, and cadmium) of particular concern that should be evaluated for increased early-life susceptibility. The commenter discussed each HAP's dangers, listed multiple journal articles, and cited attachments to the comment letter to support the commenter's statements.

The commenter suggested that the EPA should adopt the CalEPA OEHHA child-protective scientific approach on cancer and other pollutants, and use at least an additional 10-fold uncertainty factor to protect children. The commenter stated that the EPA must follow the lead of OEHHA by using age-dependent adjustment factors for all carcinogens emitted by this source, including hexavalent chromium, acetaldehyde, formaldehyde, HCE, benzene, naphthalene, vinyl chloride, and others. The commenter asked that the EPA update its list of carcinogenic HAPs that act by a mutagenic mode of action to include more recent evaluations of carcinogenic modes of action and to account for increased cancer risk resulting from prenatal exposures. The commenter suggested that the EPA use the OEHHA age-dependant adjustment factors and assess exposure during fetal development; use an additional factor, similar to OEHHA's 10X adjustment factor for cancer risk due to prenatal to 2 year exposures, to address

[63] See memorandum from T. Holloway, RTI, to J. Bradfield, B. Schrock, K. Spence, and N. Swanson, EPA. *Recommendations Concerning Residual Risk Remodeling for the Pulp and Paper Industry*, May 8, 2012, in the docket for the subpart S rulemaking.

early life exposure in its risk assessment; and to use adjustment factors for all carcinogens in assessing health risk for children and pre-natal exposure.

The commenter asked that the EPA use OEHHA child-specific reference doses to assess chronic non-cancer and acute health risk, where they are available, including for cadmium, manganese, and nickel, as well as the lead benchmark. The commenter observed that the EPA has the scientific ability to translate these reference doses for oral, inhalation, and other pathway assessments.

The commenter proposed that the EPA apply at least a 10-fold margin of safety factor to protect children in these rulemakings, in addition to the uncertainty factors it already uses, when a child-specific reference value or vulnerability information is not available. The safety factor should be applied as well for chronic (non-cancer) and acute health risk, according to the commenter.

The commenter recommended that the EPA consult with multiple scientific bodies on the scientific basis of the proposed rulemaking, and noted that adopting the OEHHA guidelines on age-dependent adjustment factors and child-specific reference doses and accounting for the greater exposure and vulnerability of children would be consistent with the SAB's recommendations. The commenter observed that Congress recognized this science in toxics legislation in 1996, the Food Quality Protection Act (FQPA) for pesticide chemical residue, where Congress used a 10-fold margin of safety for infants and children.

The commenter provided a table of comparisons between OEHHA child-health reference values and those of EPA. The commenter provided references for the statements in this comment as attachments to the comment letter, and as citations in footnotes.

Response: The EPA disagrees with the commenter's statement that this risk assessment underestimates risk to children and lacks consideration of early-life susceptibility. The EPA agrees that biological differences across life stages may lead to differences in the susceptibility to HAP, as can differences among population groups due to pre-existing disease states or other factors. Accordingly, the methods we use in risk assessments have taken this into account. For the dose-response component of HAP assessments for RTR, the EPA uses exposure reference concentrations and unit risk estimates that are expressly derived with the objective of protecting sensitive populations and lifestages, including children.[64] For example, a review of the chronic reference value process concluded that the Agency's RfC derivation process adequately considered potential susceptibility of different subgroups with specific consideration of children, such that the resultant RfC values pertain to the full human population, including "sensitive subgroups," which are inclusive of childhood. Cancer risk assessments are performed in accordance with EPA's Supplemental Guidance.[65] This Guidance recommends the application of age-dependent adjustment factors for assessing cancer risk from carcinogenic pollutants

[64] See U.S. EPA. (2002), *A Review of the Reference Dose and Reference Concentration Processes*. EPA/630/P-02/002F. Risk Assessment Forum, Washington DC. Available online at *http://www.epa.gov/raf/publications/pdfs/rfd-final.pdf*.

[65] See U.S. EPA. (2005), *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens*. EPA/630/R-03/003F. Washington, DC. Available online at: *http://www.epa.gov/cancerguidelines/guidelines-carcinogen-supplement.htm.*

concluded to act via a mutagenic mode of action and for which information on early-life susceptibility is lacking. The basis for this methodology is provided in the 2005 Supplemental Guidance. With regard to other carcinogenic pollutants for which early-life susceptibility data are lacking, it is the Agency's long-standing science policy position that use of the linear low-dose extrapolation approach (without further adjustment) provides adequate public health conservatism in the absence of chemical-specific data indicating differential early-life susceptibility or when the mode of action is not mutagenicity.[66]

The EPA disagrees with the commenter statement that that EPA should use California EPA's child specific-reference doses for school site risk assessments[67] in order to address the potential for early-life susceptibility. The EPA methods for assessing hazard and dose-response relationships for HAPs and developing RfCs and cancer risk estimates, as noted above, specifically address the potential for early-life susceptibility. Whenever data indicate increased susceptibilty of a developmental lifestage or of a population group, those data are factored into the analysis. When data are inadequate to understand the effects of a specific pollutant on sensitive subpopulations, which for some pollutants may include children, the Agency's risk assessment methods take that into account to ensure that resulting assessments address the possibility that such subpopulations might be more or less sensitive. Further, in the RTR risk assessments performed using the agency's preferred dose-response values, exposure is characterized as occurring all day, every day over a lifetime, rather than only during specific periods of time during childhood. In addition, the EPA has a hierarchy of appropriate health benchmark values and in general, this hierarchy places greater weight on the EPA derived health benchmarks than those from other agencies (see *http://www.epa.gov/ttn/atw/nata1999/99pdfs/healtheffectsinfo.pdf)*. Notably, this hierarchy favoring EPA benchmarks (when they exist) over all others has been endorsed by the SAB.

36. Comment: Commenter 0218 stated that EPA has failed to provide a reasoned explanation for its proposed determination that the current level of health risk for the pulp and paper source category is acceptable, and that the EPA should find health risk from this source category to be unacceptable under section 112(f)(2).

The commenter argued that the EPA has not adequately justified its proposed determination that health risk is acceptable, given the EPA's findings of cancer risk that is 10 times the target of section 112(f)(2), *i.e.*, 10-in-1 million (based on allowable emissions), an acute health risk of 20, which is 10 times EPA's own safety threshold, a TOSHI of 0.6 (based on allowable emissions), and that this source category emits PB-HAPs, including one (POM) which poses a multipathway risk that is 2 times EPA's threshold. The commenter stated that in the NESHAP for ferroalloys production (76 FR 72508), the EPA found the combination of cancer

[66] *Id*.

[67] We note that California EPA's use of these numerical values, which do not exist for inhalation exposures, is limited to the context of risk assessment at proposed or existing California school sites and does not extend to their Air Hot Spots Risk Assessment program. Further the guidance for the California EPA school site assessment program specifies the use of California OEHHA or U.S. EPA IRIS values in the absence of the school site risk assessment child-specific values (Cal OEHHA, *Guidance for School Site Risk Assessment Pursuant to Health and Safety Code Section 901(f): Guidance for Assessing Exposures and Health Risks at Existing and Proposed School Sites, Final Report*, February 2004, available online at: *http://www.oehha.ca.gov/public_info/public/kids/pdf/SchoolscreenFinal.pdf*).

risk of 80-in-1 million actual/100-in-1 million allowable and chronic non-cancer TOSHI of 90 actual/200 allowable to be "unacceptable." The commenter recommended that the EPA should do the same here, because there is both a high cancer and acute health risk for this source category.

The commenter also asserted that the EPA's risk assessment does not provide a full picture of the true risk, citing omissions in the EPA's risk assessment and uncertainties, such as a lack of accounting for the additional health risk to children and pregnant women, a lack of reference values for some pollutants, and failure to assess risk from malfunctions or violations. The commenter argued that all of these gaps mean that it is uncertain how much the EPA underestimated risk, and the EPA should find the health risk from this source category to be "unacceptable." The commenter concluded that because EPA's risk assessment and acceptability determination fail to address or consider important elements of the emissions, exposure, and health risk, EPA's analysis is incomplete, unlawful, and arbitrary and capricious.

Response: Pollutant-specific RfCs are not absolute thresholds, but estimates of chronic inhalation exposures, at or below which health effects would not be expected to occur, including in sensitive subgroups. We further note that these RfCs are developed using a health-protective approach[68] and that TOSHI values of 1 or less are (like RfC levels) generally considered to carry no appreciable risk of adverse health effects. We further note that we generally draw no bright lines of acceptability regarding cancer or non-cancer risks from source category HAP emissions, and that it is always important to consider the specific uncertainties of the emissions and health effects information regarding the source category in question when deciding exactly what level of cancer and non-cancer risk should be considered acceptable. In addition, the source category-specific decision of what constitutes an acceptable level of risk should be a holistic one; that is, it should simultaneously consider all potential health impacts--chronic and acute, cancer and non-cancer, and multipathway--along with their uncertainties, when determining the acceptable level of source category risk. Experience with source category rulemakings in the past tells us that this means that drawing bright lines for such decision-making is impossible. The Benzene NESHAP decision framework of 1989 acknowledged this; in today's world, such flexibility is even more imperative, because new information relevant to the question of risk acceptability is being developed all the time, and the accuracy and uncertainty of each piece of information must be considered in a weight-of-evidence approach for each decision. This relevant body of information is growing fast (and it will continue to grow faster and faster), necessitating a flexible weight-of-evidence approach that acknowledges both complexity and uncertainty in the simplest and most transparent way possible. While this challenge is formidable, it is nonetheless the goal of the EPA's RTR decision-making, and it is the goal of the risk assessment to provide the information to support the decision-making process.

In this case, considering all the available risk information and the uncertainties associated with that risk information, risk was found to be acceptable. However, as is the case for all RTR reviews, as part of the second step ample margin of safety analysis, we did look for additional controls and process improvements that might further reduce risks in a cost-effective, technically feasible manner. In this case however, we didn't find any such controls.

[68] See section 4.2 (uncertainty discussion) in U.S. EPA's *Risk Assessment for the Pulp & Paper Source Category*, in the docket for the subpart S rulemaking.

With respect to the potential for multipathway risk, we note that the results referenced by the commenter were from a worst-case screening scenario and do not indicate that adverse multipathway effects are going to occur. The EPA has since developed a refined emission screening thresholds using TRIM.FaTE. This refined approach uses; (1) improved toxicity rating/scaling methods for POMs and dioxin congeners; (2) improved fate, transport, and uptake behavior thru the aquatic food chain; and (3) updated fish and soil ingestion rates. The above changes resulted in a higher screening threshold for emissions of POMs, resulting in the PB-HAP emissions being below the screening threshold by a factor of 9 and below a risk screening scenario with an excess cancer risk of 1 in a million.[69]

It would be inappropriate for EPA to add a screening threshold exceedance as an estimate for multipathway risks with the modeled inhalation risks. The screening threshold is *not intended to be used to produce quantitative estimates* of actual or potential risk. Rather, it provides a basis for determining if residual human health risks are of potential concern. The screening thresholds are based upon a worst-case scenario, which may not even be applicable to the site, depending upon geography and release parameters for those pollutants that are PB-HAPs.

Addressed elsewhere in this document are the commenter's concerns about the additional health risk to children and pregnant women (see the response to comment no. 35), the lack of reference values for some pollutants (see the response to comment no. 24), and assessing risk from malfunctions or violations (see the response to comment no. 16).

37. Comment: Commenter 0218 recommended that EPA find the cancer risk from this source category to be "unacceptable," reduce cancer risk to a lower level, and aim to achieve a cancer risk below 1-in-1 million, as that is the statutory target of section 112(f)(2).

The commenter disagreed with the EPA's basing of its acceptability determination on the outdated presumptive limit (100-in-1 million) of what level of cancer risk is acceptable, which is based on the "presumptive limit" of acceptability that EPA created in the 1989 Benzene Rule. The commenter stated that the EPA has not adequately explained why it is not requiring additional emission reductions that would further reduce cancer risk to ensure an acceptable level of risk in today's world. The commenter noted that significant reasons exist for EPA to set a lower presumptive level of risk acceptability, including the need to better protect children, as well as knowledge of the grave health risks at stake for local communities and the need for environmental justice (EJ). The commenter observed that science, pollution controls, and societal values and standards of fairness–including a new commitment to EJ–have all advanced dramatically in recent years and since the 1980s. To bolster the commenter's argument, the commenter listed multiple milestones that have occurred since the 1988 presumptive benchmarks, including the 1990 CAA amendments, EO 12898 on Environmental Justice, EO 13045 on Children's Environmental Health, and other findings and determinations regarding children's health. The commenter stated that applying the acceptability presumption developed from the 1988 document is arbitrary and capricious for the following reasons:

[69] For more information on the changes made to the PB-HAP screening thresholds, refer to U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category*, Appendix 4, "Overview of Tiered Approach to Assessing Multipathway Exposures for RTR," in the docket for the subpart S rulemaking.

- The CAA requires an up-to-date contemporary assessment; section 112(f)(2) directs the EPA to assess and address risk remaining to public health and the environment 8 years after the MACT standard is in place, a inherent direction to take account of new circumstances;
- There is significant new information on the factors the EPA discussed in its old rulemaking that should influence its analysis of what level of risk is currently "acceptable";
- Scientific research has evolved dramatically since the EPA set that presumption. The commenter cited risk assessment studies and guidance, studies on children's exposure to toxics, and CDC reports as providing evidence of the EPA and other federally funded research and developments in health effects of chemicals (examples were provided as attachments to the commenter's letter);
- The EPA's commitment to EJ must inform its consideration of what level of risk is "acceptable," as required by the 1994 Environmental Justice EO and 2010 guidance to direct all federal agencies to take EJ into consideration; and
- American values and policies have evolved to tolerate less health risk from industrial pollution since the 1988 *Survey*, and Congress amended the CAA after the 1988 study to reduce deaths and human health risks from air pollution, presumably because it did not consider the risk of death from air pollution at that time to be acceptable.

Response: As an initial matter, we note that in 1990, Congress codified in section 112(f) of the CAA the decision approach we use for interpreting our residual risk analyses (*i.e.*, the Benzene NESHAP, 54 FR 38044). Under that approach, the 100-in–a-million cancer risk is not a bright line indicating that risk is "acceptable," but rather we consider this health metric in conjunction with a variety of health factors to determine whether the risk is acceptable. Where we conclude that the risk is not acceptable, we cannot consider costs in requiring controls to bring risks down to an acceptable level. However, the analysis of whether risk is acceptable is not the endpoint. Once we determine that controls are sufficient to ensure risk is acceptable, we again review the health metrics in conjunction with considering the costs of controls to determine whether additional controls should be required to provide an ample margin of safety.

Moreover, the commenter does not support their contention that people are now unwilling to accept a level of risk that was acceptable at the time the CAA was amended in 1990. Nor does the commenter support how science has evolved in a way that would undermine the codified framework for determining acceptability. We note that, for purposes of the proposed rule, relative to EJ issues, we performed a demographic analysis for the purpose of informing the public, and that analysis is in the docket.[70]

38. Comment: Commenter 0218 stated that EPA should reduce the threshold of what cancer risk is presumed to be acceptable, and find the cancer risk in the proposed rule to be unacceptable. The commenter observed that although the HON decision found that EPA was not required to achieve a lifetime cancer risk of 1-in-1 million, that decision recognized that EPA has full authority to protect public health by reducing risk to a lower level, and the decision did not

[70] See U.S. EPA's *OAQPS Environmental Justice Analytical Team Report*, in the docket for the subpart S rulemaking.

authorize EPA to continue presuming forever that any lifetime cancer risk between 1-in-1 million and 100-in-1 million is acceptable. The commenter observed that references to the Benzene Rule in section 112(f) also do not give EPA blanket authorization to avoid updating the Benzene Rule approach forever (See 42 U.S.C. 7412(f)(2)(B) [stating that 112 provision shall not "be construed as affecting, or applying to" EPA's interpretation of the statute as set forth in the Benzene Rule, 54 FR 38044], and 7412(f)(2)(A) [referring to the Benzene Rule]).

Response: We do not consider the 1-in-1 million MIR level as a 'bright line' mandated level of protection for establishing residual risk standards. In determining the ample margin of safety (*i.e.*, the level of the standard), health risk is one factor that we must consider, along with other factors such as cost and technological feasibility. Balancing these and other factors with the ability to achieve meaningful risk reduction is a critical component of the residual risk rulemaking process. The major contributors to this risk are HCE and naphthalene from kraft processes such as pulp storage, wastewater, and bleaching. In general, the contribution of the source category to elevated facilitywide cancer or non-cancer risks is low throughout the facilities in this source category. The maximum facility-wide MIR is 30 in a million, with the pulp and paper source category (MACT code 1626-1) contributing 27 percent of the risk. The remaining 63 percent is driven by emissions of arsenic and hexavalent chromium from hazardous waste incineration. The maximum facility-wide TOSHI is 2, driven by emissions of antimony compounds from kraft SDT process units. The pulp and paper source category (MACT code 1626-1) contributes approximately 11 percent to the facility-wide TOSHI.

39. Comment: Commenter 0225 stated that in their community, the largest polluter is Port Townsend Paper Corporation (PTPC). Extensive health impacts are suffered from the pollutants emitted at the mill site, including, but not limited to, respiratory distress, seizures, and chronic asthma. The commenter stated there were strong smells emanating from the mill. The commenter expressed concern about the increased health impacts from those individuals at the nearby school and hospital.

Commenter 0225 rejected the acceptable risk levels, as determined in the Benzene NESHAP, as acceptable in the commenter's area of residence. The commenter attached two documents citing Washington Cancer Registry Figures (see commenter attachments 0225.2 and 0225.3), stating that Port Townsend/Jefferson County WA is in the top 3 of 39 Washington counties for 11 out of 24 types of cancer. The commenter contended that if the mill is operating within legal limits, those established limits are too high.

Response: The final residual risk assessment for the subpart S NESHAP RTR is available in the docket and at *http://www.epa.gov/ttn/atw/pulp/pulppg.html*. It is unclear whether the commenter is referring to emissions from sources that were subject to this review or other regulated emissions from the facility. Appendix 5 in the assessment provides all of the risk impact information for each individual site in the pulp and paper category, including Port Townsend Paper Corporation, NEI ID NEI42357. The conclusion of our assessment was that the risk associated with HAP emissions from all facilities in this category is acceptable. As part of the information collection activity associated with the rule development, we collected and reviewed operating permits issued to facilities in the industry. Like other industry facilities, the Port Townsend mill is subject to regulations other than section 112 NESHAP (*e.g.*, New Source Performance Standards (NSPS) for Kraft Pulp Mills, 40 CFR part 60 subpart BB), and the mill

has agreed to permit conditions for regulated pollutants (*e.g.*, total reduced sulfur [TRS]) that were not subject to this regulatory review but will be reviewed in the future.

40. Comment: Commenter 0218 asserted that EPA should find the acute health risk from the pulp and paper source category to be unacceptable under section 112(f)(2). The commenter observed that in the EPA's 2004 risk assessment documentation, the EPA stated that an HQ of 1 or less indicates a safety threshold for EPA for both chronic non-cancer and acute health effects, and when an HQ value is more than 1, additional information is used to determine if there is a potential for significant acute risk. The commenter disagreed with the EPA's determination that with an acute HQ of 20, risk is acceptable. Additionally, the commenter observed, the EPA's acute health risk number did not include the combined acute health risk that can occur due to multiple pollutant emissions simultaneously in an acute health incident and did not assess facility-wide acute health risk, and the EPA did not assess the acute health risk based on allowable emissions.

Response: As noted in a previous response, we generally draw no bright lines of acceptability regarding cancer or non-cancer risks from source category HAP emissions, and it is always important to consider the specific uncertainties of the emissions and health effects information regarding the source category in question when deciding exactly what level of cancer and non-cancer risk should be considered acceptable. In addition, the source category-specific decision of what constitutes an acceptable level of risk should be a holistic one; that is, it should simultaneously consider all potential health impacts--chronic and acute, cancer and non-cancer, and multipathway--along with their uncertainties, when determining the acceptable level of source category risk. Experience with source category rulemakings in the past tells us that this means that drawing bright lines for such decision-making is impossible. In this case, considering all the available risk information and the uncertainties associated with that risk information, risk was found to be acceptable. However, as is the case for all RTR reviews, as part of the second step ample margin of safety analysis, we did look for additional controls and process improvements that might further reduce risks in a cost-effective, technically feasible manner. In this case however, we didn't find any such controls. In addition, it should be noted that the max off-site HQ was actually 15, which was rounded to 20, and the HQ (AEGL-1) was 0.4. For a location in which people reside, the HQ (REL) was actually only 2.

We disagree with the commenter that EPA should create a combined acute risk number that would represent the total acute risk for all pollutants that act in a similar way on the same organ system or systems (similar to the chronic TOSHI). As noted in previous responses, the worst-case acute screen is already a conservative scenario. That is, the acute screening scenario assumes worst-case meteorology, peak emissions for all emission points occurring currently and an individual being located at the site of maximum concentration for an hour. Thus, as noted in section 2.7.2 of the risk assessment document[71]: "because of the conservative nature of the acute inhalation screening and the variable nature of emissions and potential exposures, acute impacts were screened on an individual pollutant basis, not using the TOSHI approach."

[71] See U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category*, in the docket for the subpart S rulemaking.

41. Comment: Commenter 0218 disagreed with the EPA's acceptability determination for chronic non-cancer health risk. The commenter urged the EPA to not assume that 1 is an acceptable level of chronic non-cancer risk from a single major air toxics source category. The commenter observed that the EPA failed to account for the greater risk to children and due to early exposure and did not assess cumulative toxic air health risk.

The commenter stated that by finding that a non-cancer TOSHI of 1 or below is not a human health concern, EPA has arbitrarily ignored its staff's past scientific assessment of this issue, in the 2002 internal memo Residual Risk Program: Selection of Hazard Index Limits, where EPA stated that the default HI limit for chronic non-cancer risks should be well under 1.0 for individual sources—specifically, staff then recommended that it should be no higher than 0.2. The commenter recommended that the EPA reduce the TOSHI presumptive acceptability threshold to 0.2 or below to ensure that EPA is fully protecting the most-exposed people in local communities exposed to multiple sources and types of toxic air pollution.

The commenter expressed concern that the EPA conceded that the TOSHI itself "may have been underestimated," in a statement, confusing to the commenter, that only says that "impacts on organs or systems that occur above the critical dose have not been included in the TOSHI calculations." The commenter observed that this is a dramatic way of underestimating risk, in that if EPA takes out impacts that are occurring above the critical dose, EPA is ignoring health risk that has already reached an unacceptable level. The commenter stated that this has no rational basis and demonstrates that EPA must reduce the TOSHI.

According to the commenter, the EPA's facility-wide risk that shows a TOSHI of 2 and contribution of 11 percent of the risk from this source category is a significant contribution. The commenter asserted that the EPA must reduce the TOSHI for the pulp and paper source category because it is contributing over 10 percent of the facility-wide risk, which is 2 times EPA's own threshold.

The commenter further argued that the EPA has not combined its risk analyses, but has listed them all together and treated them as separate types of risk, which is unlawful, arbitrary, and capricious, and it undermines EPA's acceptability determination. The commenter stated that EPA has failed to justify how the chronic non-cancer risk number could be acceptable when combined with all of the other kinds of health risks that EPA has found, including high cancer risk (that is, above 1-in-1 million), multipathway risk, and high acute risk.

Response: The EPA disagrees with the commenter's notion that any TOSHI value greater than 0.2 should be considered unacceptable. We note that pollutant-specific RfCs are not absolute thresholds, but estimates of chronic inhalation exposures at or below which health effects would not be expected to occur, including in sensitive subgroups. We further note that these RfCs are developed using a health-protective approach (see uncertainty discussion in risk assessment document, section 4.2)[72], that TOSHI values of 1 or less are (like RfC levels) generally considered to carry no appreciable risk of adverse health effects and that there is generally no need to compound this protection by suggesting that any source category maximum TOSHI value would need to be at or below 0.2 before we would consider it to be acceptable.

[72] *Id*., section 4.2.

We further note that we generally draw no bright lines of acceptability regarding cancer or non-cancer risks from source category HAP emissions, and that it is always important to consider the specific uncertainties of the emissions and health effects information regarding the source category in question when deciding exactly what level of cancer and non-cancer risk should be considered acceptable. In addition, the source category-specific decision of what constitutes an acceptable level of risk should be a holistic one; that is, it should simultaneously consider all potential health impacts--chronic and acute, cancer and non-cancer, and multipathway--along with their uncertainties, when determining the acceptable level of source category risk. Experience with source category rulemakings in the past tells us that this means that drawing bright lines for such decision-making is impossible. The Benzene NESHAP decision framework of 1989 acknowledged this; in today‘s world, such flexibility is even more imperative, because new information relevant to the question of risk acceptability is being developed all the time, and the accuracy and uncertainty of each piece of information must be considered in a weight-of-evidence approach for each decision. This relevant body of information is growing fast (and it will continue to grow faster and faster), necessitating a flexible weight-of-evidence approach that acknowledges both complexity and uncertainty in the simplest and most transparent way possible. While this challenge is formidable, it is nonetheless the goal of the EPA‘s RTR decision-making, and it is the goal of the risk assessment to provide the information to support the decision-making process.

Finally, we note that the commenter‘s source for its statement that default limits for HI should or must be established at 0.2 rests on an internal EPA staff memo (from 2002) which was never adopted as Agency policy (and never reviewed by the public or by any peer review body) and consequently carries no precedential weight.

The EPA appreciates the commenter’s confusion with respect to the statement in the risk assessment report regarding the potential for underestimating TOSHIs, and will attempt to clarify here.

The "critical effect" is the adverse effect which occurs at the lowest exposure level. The EPA sets the RfC to protect against this critical effect and considers it logical to assume that any other effects occurring at higher exposure levels would not occur if exposures are below those that elicit the critical effect. In other words, by protecting against the critical effect, the RfC is also protective for effects associated with higher exposure levels.

The EPA does not set RfCs for these other effects, and this can introduce some uncertainty into a non-cancer risk assessment, in cases where a TOSHI is calculated. For example, if a solvent affects the liver, and also affects the kidney–but at a higher dose, EPA will set the RfC based on the liver effect. There will not be an RfC for that chemical as it relates to effects on the kidney. If that solvent is encountered along with other solvents which also exert an effect on the kidney, the contribution of the solvent in question to the kidney effect would not be included in the TOSHI. Whether this would result in a significant underestimate of a TOSHI in all cases is unknown. The EPA recognizes this issue is a longstanding one and considers it part of the uncertainty inherent in a non-cancer risk assessment.

With regard to facility-wide risk, if a source category contributes significantly to elevated facility-wide non-cancer risks, we may consider whether additional standards should be required

to reduce those risks. For this source category, the modeled risks were deemed acceptable, with whole-facility risks being driven from emission sources outside the regulated source category in this rule. The risks from these additional categories, namely from industrial boilers and smelt dissolving tanks, will be assessed in future RTR rulemakings.

42. Comment: Commenter 0218 stated that the EPA has failed to explain its conclusion that multipathway risk is "acceptable." The commenter asserted that the EPA failed to fully assess multipathway health risk (for multiple reasons listed in other comments) and to combine health risks to assess the cumulative risk burden. The commenter suggests that as a result of this high multipathway risk, the most exposed person will face a total cancer risk that is above the cancer risk the EPA described in the preamble, though it is unclear by how much more because the EPA has not provided the risk data needed to inform this. According to the commenter, the EPA must require further reductions in multipathway risk to achieve an acceptable level.

Response: The EPA developed the scenario in the multipathway screen in order to estimate the upper end of the range of individual, long-term, non-inhalation exposures for situations likely to be encountered in the United States. The approach is described in the "Overview of Tiered Approach to Assessing Multipathway Exposures for RTR," available as Appendix 4 to the risk assessment document in the docket for the subpart S rulemaking.[73]

Since proposal, EPA has refined the emission screening thresholds, which use TRIM.FaTE. These refinements include: (1) improved toxicity rating/scaling methods for chemical specific POMs and dioxin congeners to account for their individual fate and transport properties versus using the fate and transport properties of benzo(a)pyrene and 2,3,7,8-TCDD; (2) improved fate, transport, and uptake behavior through the aquatic food chain; and (3) updated fish and soil ingestion rates from EPA's 2011 *Exposure Factors Handbook*.[74] These changes resulted in a revised screening threshold for emissions of POM, which results in the POM emissions for all pulp and paper facilities being below the screening threshold. We note that this is a screening level analysis; therefore, these results are biased high for purposes of screening and are subject to significant uncertainties. Moreover, we note that these screening results do not necessarily indicate that multipathway risks actually exist, only that we cannot rule them out as a possibility if the screening thresholds are exceeded. It would be inappropriate for EPA to add a screening threshold exceedance as an estimate for multipathway risks with the modeled inhalation risks.

When considered along with the results from the inhalation assessment (where the highest MIR risk was 10 in a million), we determined that the estimated multipathway risks with POM emissions for the source category would still be below the cancer inhalation MIR for the

[73] See U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category*, Appendix 4, "Overview of Tiered Approach to Assessing Multipathway Exposures for RTR," in the docket for the subpart S rulemaking.
[74] See U.S EPA, *Exposure Factors Handbook: 2011 Edition*; EPA/600R-090/052F; available online at: *http://www.epa.gov/ncea/efh/pdfs/efh-complete.pdf*

source category at 10 in a million, based upon how the risk screening emission thresholds were developed.[75]

43. Comment: Commenter 0218 recommended that the EPA aggregate health risk for the source category and decide whether the total health risk from each pollutant or from all pollutants combined is unacceptable, and to not do so is arbitrary and capricious. The commenter stated that the EPA is required to assess a community's total exposure to toxic air pollution, in context, to decide how much additional pollution protection is needed from this source category, *i.e.*, the source category's necessary amount of reduction. The commenter asked that the EPA aggregate risk from multiple sources of pollution, multiple pollutants, and recognize background levels of past exposure that increases current health risk to create a combined health risk metric that accounts for synergistic effects. The commenter believes that by not performing a full, cumulative risk assessment, EPA failed to demonstrate that the risk remaining under its proposed rule would be "acceptable." The commenter stated that the EPA must combine the health risks and address them together as a whole cumulative health burden to satisfy its legal duty under section 112(f)(2), and to consider all health risks to the most-exposed person, combined, from this source category.

Commenter 0218 maintained that the EPA must incorporate a margin of safety (or uncertainty) factor EPA must incorporate a margin of safety (or uncertainty) factor to account for a history of exposure or exposure to additional emissions beyond each source category under review. The commenter stated that the EPA should account for the history of exposure to toxic air pollution and for ongoing exposure to the source category's toxic air emissions combined with other HAP emissions from multiple sources, by applying additional safety factors in its acceptability determination. The commenter suggested that the EPA apply an uncertainty factor based on the number of other facilities contributing HAP exposure risks; thus, the total risk that is acceptable for the most-exposed person must be less for each of the source categories to which the person is exposed.

According to the commenter, the EPA has full authority under section 112(f)(2) to address the full public health risk faced by the affected individuals and community before deciding what limit to set for this source category. The commenter explained that the EPA is required to decide whether to set a standard for a given source category if the cancer risk from that specific source category is 1-in-1 million or more, and if that source category's emissions are between 1-in-1 million and the presumptive limit on acceptability (currently 100-in-1 million); and if that source category is contributing risk along with numerous other source categories, then EPA has the authority under section 112(f)(2) to decide both that the total, cumulative risk is unacceptable, and that the specific risk contributed by the source category is unacceptable. The commenter cited the EPA's explanation in the Coke Ovens Rule, where the EPA addressed and set a limit to account for increased community exposure at the final stage of its "ample margin of safety" determination.

[75] For more information on the changes made to the PB-HAP screening thresholds, refer to U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category*, Appendix 4, "Overview of Tiered Approach to Assessing Multipathway Exposures for RTR," in the docket for the subpart S rulemaking.

Response: The EPA addressed the aggregate health risk for the source category by conducting an assessment of the cumulative cancer risks from emitted carcinogens and the cumulative non-cancer HIs from all emitted non-carcinogens affecting the same target organ system (TOSHI) for both the source category emissions and the facility-wide emissions. All TOSHI calculations presented here were based exclusively on effects occurring at the "critical dose" (i.e., the lowest dose that produces adverse health effects). This assessment excluded background contributions from HAPs as well as PB-HAPs.

We note that section 112(f)(2) of the CAA expressly preserves our use of the two-step process for developing standards to address residual risk and interpret "acceptable risk" and "ample margin of safety" as developed in the Benzene NESHAP. [76] In the Benzene NESHAP, EPA rejected approaches that would have mandated consideration of background levels of pollution in assessing the acceptability of risk, concluding that "…comparison of acceptable risk should not be associated with levels in polluted urban air. With respect to considering other sources of risk from benzene exposure and determining the acceptable risk level for all exposures to benzene, EPA considers this inappropriate because only the risk associated with the emissions under consideration are relevant to the regulation being established and, consequently, the decision being made." (54 FR 38044, 38061, September 14, 1989).

Although not appropriate for consideration in the determination of acceptable risk, we note that background risks or contributions to risk from sources outside the facilities under review could be one of the relevant factors considered in the AMOS determination, along with cost and economic factors, technological feasibility, and other factors. Background risks and contributions to risk from sources outside the facilities under review were not considered in the AMOS determination for these source categories, mainly because of the significant uncertainties associated with emissions estimates for such sources.

44. Comment: Commenter 0218 stated that EPA failed to combine risks from multiple HAP and pathways and thus failed to assess cumulative impacts and health risk. In order to satisfy section 112(f)(2), the commenter contended that the EPA should:

- Create a combined acute risk number that would represent the total acute risk for all pollutants that act in a similar way on the same organ system or systems, similarly to the chronic TOSHI;
- Perform a cumulative risk assessment that combines inhalation and multipathway risk for each pollutant, including pollutants such as cadmium, arsenic, mercury, and lead that cause both types of risk;
- Create any metric to assess the total, combined health risk that could be used to assess the cumulative impact of all of the types of risks and to view risks as a single cumulative burden.

Response: We disagree with the commenter that EPA should create a combined acute risk number that would represent the total acute risk for all pollutants that act in a similar way on

[76] *National Emission Standards for Hazardous Air Pollutants: Benzene Emissions from Maleic Anhydride Plants, Ethylbenzene/Styrene Plants, Benzene Storage Vessels, Benzene Equipment Leaks, and Coke By-Product Recovery Plants* (54 FR 38044, September 14, 1989) (Benzene NESHAP).

the same organ system or systems (similar to the chronic TOSHI). As noted in previous responses, the worst-case acute screen is already a conservative scenario. That is, the acute screening scenario assumes worst-case meteorology, peak emissions for all emission points occurring currently and an individual being located at the site of maximum concentration for an hour. Thus, as noted in section 2.7.2 of the risk assessment document: "because of the conservative nature of the acute inhalation screening and the variable nature of emissions and potential exposures, acute impacts were screened on an individual pollutant basis, not using the TOSHI approach."[77] In the future, we will, continue to refine various aspects of our acute assessments as methods improve and more data become available. Attendant to such improvement will be a reconsideration of whether to use TOSHI in our acute assessments.

It would also be inappropriate for EPA to add a screening threshold exceedance as an estimate for multipathway risks with the modeled inhalation risks. The screening threshold is *not intended to be used to produce quantitative estimates* of actual or potential risk. Rather, it provides a basis for determining if residual human health risks are of potential concern. The screening thresholds are based upon a worst-case scenario, which may not even be applicable to the site, depending upon geography and release parameters for those pollutants that are PB-HAPs. Failure of a screen could result in a decision for facility-specific multipathway assessments being undertaken.

45. Comment: Commenter 0218 maintained that the EPA must incorporate a margin of safety (or uncertainty) factor to account for a history of exposure or exposure to additional emissions beyond each source category under review. The commenter stated that the EPA should account for the history of exposure to toxic air pollution and for ongoing exposure to the source category's toxic air emissions combined with other HAP emissions from multiple sources, by applying additional safety factors in its acceptability determination.

The commenter suggested that the EPA apply an uncertainty factor based on the number of other facilities contributing HAP exposure risks; thus, the total risk that is acceptable for the most-exposed person must be less for each of the source categories to which the person is exposed.

According to the commenter, the EPA has full authority under section 112(f)(2) to address the full public health risk faced by the affected individuals and community before deciding what limit to set for this source category. The commenter explained that the EPA is required to decide whether to set a standard for a given source category if the cancer risk from that specific source category is 1-in-1 million or more, and if that source category's emissions are between 1-in-1 million and the presumptive limit on acceptability (currently 100-in-1 million); and if that source category is contributing risk along with numerous other source categories, then EPA has the authority under section 112(f)(2) to decide both that the total, cumulative risk is unacceptable, and that the specific risk contributed by the source category is unacceptable. The commenter cited the EPA's explanation in the Coke Ovens Rule, where the EPA addressed and set a limit to account for increased community exposure at the final stage of its "ample margin of safety" determination.

[77] See U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category*, in the docket for the subpart S rulemaking.

Response: See the response to comment number 43 above.

46. Comment: Commenter 0218 stated that, by focusing on cost, the EPA failed to set a residual risk standard that provided the requisite "ample margin of safety to protect public health," pursuant to CAA section 112(f)(2). The commenter argued that the "ample margin" determination assumes that EPA has already reduced risk to an "acceptable" level, and requires EPA to consider additional reductions to provide an "ample margin," not just the bare minimum amount of protection for public health, including cancer and non-cancer risks. However, according to the commenter, the EPA's "ample margin" analysis did not center on health protection but on cost.

The commenter noted that the EPA failed to consider or determine whether its proposed rule provided the maximum feasible protection against health risks for the greatest number of people, and that the EPA included no discussion or analysis regarding what the maximum feasible protection would be, or how many people could be protected from a greater level of risk. The commenter asserted that, by setting the standard without finding or explaining how its proposal provided more than bare minimum protection for public health, the EPA rendered the phrase "ample margin of safety to protect public health" superfluous and violated section 112(f)(2).

The commenter observed that the EPA's proposal still exposed people to a cancer risk significantly higher than the 1-in-1 million target of section 112(f)(2), to acute health risk that is 20 times the threshold (HQ of 30), and to both chronic and multipathway risks. The commenter asserted that the EPA had failed to justify this or explain why there is an "ample margin of safety" under its proposed rule.

The commenter stated that the uncertainty that has likely led the EPA to underestimate health risk in the first place requires a greater margin of protection at this final rulemaking stage. The commenter pointed to recent research providing new information on why risks from air pollution are likely to be undercontrolled and underestimated.

The commenter asked that the EPA consider what is needed, particularly cumulative impacts, to provide an "ample margin of safety" to protect the most exposed person from each type of health risk, as well as the cumulative burden, or combination of health risks–cancer, chronic non-cancer, acute, and multipathway. The commenter listed factors that should be considered in order to provide an "ample margin of safety": cumulative impacts, facility-wide risk numbers, children's health, multiple source exposure, and EJ factors.

The commenter stated that the EPA may not lawfully consider cost in deciding what is the "ample margin of safety to protect public health," rather there is only an authorization to consider cost in determining whether additional standards are needed to prevent environmental harm. The commenter stated that, although the D.C. Circuit Court previously allowed the Agency to consider cost in the HON decision, that case was wrongly decided, and EPA should not rely on it as justification to evade the statute. The commenter noted that in section 112(f)(2), the clause "taking into consideration costs, energy, safety, and other relevant factors" only modifies the environmental effect prong of EPA's duty, and does not apply to the health prong of the EPA's statutory duty. The commenter further noted that the statement in section 112(f)(2)(B)

is not a clear statement authorizing the consideration of cost and it does not enshrine EPA's prior Benzene rule analysis forever in all instances, rather the purpose of citing the Benzene Rule was not to enshrine that rule or its statutory interpretations for all time, but to prevent back-sliding by the agency after the 1990 Amendments. The commenter concluded that the statute prohibits the agency from considering cost in its "ample margin" analysis.

Response: As stated in the Benzene NESHAP, in determining the need for residual risk standards in the risk acceptability determination, we strive to limit to no higher than approximately 1-in-10 thousand (100-in-1 million) the estimated risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years and, in the ample margin of safety determination, to protect the greatest number of persons possible to an individual lifetime risk level of no higher than approximately 1-in-1 million. However, in determining whether to require additional standards, these levels are not considered rigid lines, and we weigh the cancer risk values with a series of other health measures and factors, including estimates of uncertainty, in both the risk acceptability and the ample margin of safety determinations. Relative to the commenter's concerns about providing protection to the "greatest number of people," we look closely at the populations impacted at greater than 1-in-1 million risk (see Chapter 3 and Table 3.2-1 of the final risk assessment document). If we determine that the risk is unacceptable, we must impose additional requirements to reduce emissions without consideration of cost. However, as part of our determination of whether standards protect public health with an ample margin of safety, we do not look solely at whether technology is feasible, (as urged by the commenter) but also consider cost, as statutorily required. Our consideration of cost under section 112(f) is consistent with the D.C. Circuit Court's decision in the HON case. *NRDC v. EPA*, 529 F.3d 1077, 1083 (D.C. Cir. 2008) ("As explained above, subsection 112(f)(2)(B) expressly incorporates EPA's interpretation of the Clean Air Act from the Benzene standard, complete with a citation to the *Federal Register*. In that rulemaking, EPA set its standard for benzene 'at a level that provides 'an ample margin of safety' in consideration of all health information...as well as other relevant factors including costs and economic impacts, technological feasibility, and other factors relevant to each particular decision.' 54 Fed. Reg. at 38,045 (emphasis added). EPA considered cost in Benzene, and subsection 112(f)(2)(B) makes clear that nothing in the amended version of the Clean Air Act shall 'affect[ ]' the agency's interpretation of the statute from that rulemaking.") We are also required to consider cost as part of technology review under section 112(d)(6), which we are required to perform periodically.

Regarding the consideration of cumulative impacts and facility-wide impacts, the development of facility-wide risk estimates provides additional information about the potential cumulative risks in the vicinity of the RTR sources, as one means of informing potential risk-based decisions about the RTR source category or categories in question. We agree with the commenter on the need for their consideration in the assessment when it is possible. Logically, the facility-wide assessment will provide the best estimate of cumulative HAP impacts, since it will include HAP impacts from other sources on the site when emissions data are available. In this circumstance, the data were available from our ICR and used in the assessment. Because these risk estimates were derived from facility-wide emissions estimates which have not generally been subjected to the same level of engineering review as the source category emission estimates, they may be less certain than our risk estimates for the source category in question. While we recognize that fact, these risk estimates remain important for providing context, as

long as their uncertainty is taken into consideration in the process. Notably, for the RTR we are finalizing, our evaluation of facility-wide risk did not change our decisions about acceptability and ample margin of safety for this category.

As directed by section 112(f)(2), we conducted an analysis to determine if the standard provides an ample margin of safety to protect public health. Under the ample margin of safety analysis, we first considered the health impacts for the source category. Then we analyzed the potential for emissions reductions within the source category by evaluating available control technologies and their capabilities for reduction of the residual risk remaining after the implementation of MACT controls. Then we evaluated the potential costs and energy impacts of these additional controls.[78] Based on this analysis, we conclude that the current standard protects public health with an ample margin of safety.

47. Comment: Commenter 0218 stated that the EPA failed to provide a determination of the environmental effects from this source category and may not rationally or lawfully assume there is no potential for environmental effects based on the health assessment. The commenter expressed concern that the EPA stated that there is "no potential for adverse environmental effect" from this source category and that the EPA based its environmental determination on its human health assessment. The commenter disagreed with the EPA's level of assessment for environmental effects and, referencing court findings, stated that the residual risk review is the proper time for EPA to consider these effects, including the need to engage in Endangered Species Act (ESA) consultation under 16 U.S.C. 1536. However, the commenter noted that EPA has not even assessed whether there are any federally listed species with habitat near the facilities in this source category.

The commenter objected to the EPA's use of health risk numbers, stating that these numbers are above the threshold and the EPA's reference doses apply to rodents, but are not necessarily sufficient for protecting more sensitive wildlife or other environmental receptors. The commenter noted that the SAB has stated: "The assumption that ecological receptors will be protected if human health is protected is incorrect." The commenter observed that risks include inhalation risk for wildlife and persistent or bioaccumulative chemicals in the environment. The commenter asked that the EPA perform an appropriate ecological assessment.

Response: For this source category, the EPA considered effects to the environment separate from human health risk in order to determine whether it is necessary to set a more stringent standard to prevent an adverse environmental effect.

In considering effects to the environment, the EPA first determined that some HAPs of potential concern with respect to the environment (eco HAPs) are emitted from sources in this category. We call these eco HAPs. These HAPs are hydrogen chloride (HCl), chlorine (Cl_2), POM, mercury, and cadmium. We included these HAP in our environmental analysis because we determined that they have the potential to cause adverse environmental effects. For example, POM, mercury, and cadmium are persistent and bioaccumulative. Also, acid gases are very reactive and acidic and, therefore, have the potential to cause adverse effect to ecological

[78] For a full discussion of this analysis, see the memorandum in the docket titled, Ample Margin of Safety Analysis for Pulping and Papermaking Processes.

receptors by direct contact. The Agency also determined that there was at least some potential for exposures to environmental receptors, because the presence of such receptors around the sources in this category cannot be ruled out. The EPA then looked at emissions of the eco HAPs, including the highest-emitting facility for each HAP and the total emissions of each HAP from the source category. The results are presented in Table 5 below:

Table 5. Emissions of Eco HAPs from the Pulp and Paper Source Category

Pollutant	Category emissions (tpy)	Number of facilities in category reporting emissions	Emissions for highest-emitting facility	
			tpy	lbs
HCl	259	55	31.95	63,900
Cl_2	24	53	2.5	5,000
POM	0.008	29	0.0008	2
Cadmium	0.01	28	0.006	12
Mercury	0.002	27	0.0007	1

Based on the emission estimates shown above, the EPA determined that the emission levels of these pollutants are low. For instance, compared to the 2008 NEI for point sources, estimates of nationwide HCl emissions from this source category are about 0.18 percent of the total. For mercury, emissions from this source category account for about 0.0036 percent of the nationwide total. For cadmium, POM, and Cl_2, this source category accounts for about 0.043 percent, 0.0042 percent, and 1.5 percent, respectively, of the nationwide emission totals. Based on the low emissions from this source category, the Agency would not expect an environmental effect to occur.[79] Because our analyses show that we do not expect an environmental effect from this source category, we disagree with the commenter's statement that the EPA must engage in consultations (*e.g.*, with the U.S. Fish & Wildlife Service and the National Marine Fisheries Service) under 16 U.S.C. 1536(a)(2).

Even though the Agency does not expect an environmental effect to occur, we evaluated requiring additional controls to reduce these HAP emissions. For HCl and Cl_2, caustic scrubbers are already used to reduce emissions by more than 99 percent, and we did not identify any additional technology that could reduce emissions to a greater degree. For mercury, cadmium, and POM, we evaluated the cost-effectiveness of a venturi scrubber, and even assuming that the device could eliminate all of the emissions (a significant overestimate), the cost effectiveness values were about $3,000,000 per ton for cadmium, $5,000,000 per ton for POM, and more than $10,000,000 per ton for mercury. Given the high costs and minimal reductions, and the potential for secondary impacts from energy and wastewater requirements associated with the air pollution controls, we have determined that even if the source category posed a risk to the environment, it is not cost-effective to require additional controls.

[79] However, we do note that the EPA's current ability to evaluate the potential for ecological effects is limited, and we are working to improve the Agency's capacity in this regard. The results of our effort to improve these capabilities will be particularly important for source categories where emissions of eco HAPs are at a level that may be of concern.

48. **Comment**: Commenter 0171 applauded EPA's recognition of the need for additional requirements due to advancements in control technologies. The commenter urged the Agency to consider others that may be identified during the rulemaking process as well. However, because of the adverse health effects associated with exposure to the substances emitted by pulp and paper facilities, the commenter was concerned about some of the risks that EPA has identified as remaining after the implementation of MACT and its decision to not reduce them. For example, EPA is not proposing to require additional measures to address an acute non-cancer HQ of 20 (where 1 is the threshold EPA considers acceptable). The commenter recommended that EPA reexamine these findings and take any necessary steps to ensure that the public is protected in accordance with the intent of the CAA.

Response: As noted above, the acute risk screen is a worst-case scenario. It assumes worst-case meteorology, peak emissions for all emission points occurring concurrently, and an individual being located at the site of maximum concentration for an hour. Considering these factors, the EPA does not maintain that, in all RTR reviews, HQ values must be less than or equal to 1 in order for source category risk to be considered acceptable. Rather, the EPA finds that acute risks must be judged on a case-by-case basis in the context of all the available health evidence and risk analyses, including the results of the chronic, non-cancer and cancer risk analyses.

In our case-by-case analysis of the acute risks for the pulp and paper category, we determined that only 9 of the 174 mills modeled had an HQ > 1, with only 1 facility having an HQ > 10. An analysis of this site indicates that the HQ was actually 15, which was rounded to 20, and that there was no exceedance of an AEGL (HQ (AEGL-1) = 0.4). Also, the maximum exposure locations are located by the river along unpopulated forested areas. The location where people actually reside has a maximum HQ = 2. Based upon the conservative nature of the acute screen in conjunction with the chronic risks, EPA finds the risk to be acceptable for this source category. Additional information regarding the finding of acceptable risk can be found in section IV.B.1 of the preamble to the proposed rule (76 FR 81344).

2.5 Demographics

49. **Comment:** Two commenters (0161 and 0171) supported EPA conducting demographic analysis used in this pulp and paper RTR for each individual facility, rather than using its prior approach of combined generic demographic analyses for EJ concerns. Commenter 0161.1 supported EPA's approach to review the impact of the proposed regulation on minority and low-income populations. The commenter suggested the following changes to further improve the assessment: providing justification for the selection of the 1.25 threshold and ensuring that EPA's Office of Environmental Justice participates in future evaluations of proposed rules. Commenter 0171 specifically recommended that the rule writers work with EPA's Office of Environmental Justice to develop criteria and specific guidance on how to interpret and apply the outcome of EJ analyses in the rulemaking process.

Response: To the extent that data are available, the Agency uses facility-specific information to supplement the national-scale analysis. This additional information provides a more complete picture of the community surrounding the largest-emitting sources and helps

identify whether the low-income and minority populations that live near the sources in this source category are clustered around several facilities or are more equally distributed.

We agree with the commenter, and we do work closely with the EPA's Office of Environmental Justice, as well as other offices across the Agency, to develop criteria and specific guidance on how to interpret and apply the outcome of these types of analyses in the rulemaking process. To ensure that our actions comport with our statutory authorities and requirements, we work with our Office of General Counsel (OGC) and Office of Enforcement and Compliance Assurance (OECA).

50. Comment: Commenter 0218 stated that the socioeconomic disparity in health risk from the pulp and paper source category makes the risk the EPA has found unacceptable, and the EPA must finalize a rule that is consistent with the principle of EJ. The commenter asserts that the EPA's analysis has not fully assessed EJ impacts.

Commenter 0218 proposed that the EPA take action to provide EJ because it has found disproportionate impacts based on race, because the African-American community is over-represented in the category of people exposed to higher risk from this source category, compared to its national population. Since the risk from the pulp and paper source category has disproportionate effects in these communities, the commenter suggested additional monitoring and stronger enforcement provisions to prevent emission spikes, malfunctions. and other violations would help provide EJ.

The commenter stated that the EPA did not complete a full EJ analysis for this source category and should do so now to ensure that it appropriately assesses the risk to public health under section 112(f)(2) and satisfies the obligations under EO 12898, as well as EPA's own policy commitment to consider EJ in rulemaking.

After providing suggestions for improvements to the EPA's EJ assessment, the commenter recommended that the EPA also fully incorporate the improved EJ assessment into the policy decision it chooses in the final rule, by recognizing that it is not fair or acceptable for particular individuals or communities to have this type of disproportionate impact.

Response: Under EO 12898, EPA is directed to the greatest extent practicable and permitted by law, to make EJ part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies and activities on minority populations and low-income populations in the United States. Consistent with EO 12898 and the Presidential Memorandum that accompanies it, the EPA's EJ policies promote EJ by focusing attention and Agency efforts on addressing the types of environmental harms and risks that are prevalent among minority, low-income and indigenous populations. EO 12898 and the Agency's EJ policies do not mandate particular outcomes from an action, but they demand that decisions involving the action be informed by a consideration of EJ issues.

With respect to this rule, the EPA found the overall level of risk from the pulp and paper source category to be acceptable and to provide an ample margin of safety for all populations in close proximity to these sources, including minority and low-income populations. Consequently,

EPA did no further tightening of the standard. However, EPA is requiring 5-year repeat testing and eliminating the SSM exemption to ensure continuous compliance with the standards. Furthermore, repeat testing will reduce emissions and the potential for periodic episodes of acute risk by providing incentive for facilities to maintain their control systems and make periodic adjustments to ensure peak performance. Eliminating the SSM exemption will reduce emissions by requiring facilities to meet the applicable standard during SSM periods. By eliminating SSM exemptions and limiting the affirmative defense provisions to only malfunctions that result in a violation to a standard and cannot be connected to poor maintenance or mismanagement, poor work practices that may have previously remained undetected should be apparent to those responsible for oversight and implementation. Additionally, both the monitoring and reporting sections of the rule have been strengthened through the use of the Electronic Reporting Tool (ERT) and the Compliance Emission Data Reporting Interface (CEDRI). Both ERT and CEDRI will provide the public with contemporary, easily searchable electronic information about performance testing in a public database.

51. Comment: Two commenters (0218 and 0171) appreciated that the EPA recognized the need to look at population data, including on the socioeconomic impact, in order to consider the actual people affected by pollution from the pulp and paper source category, to assess the community impacts in context, and to consider EJ as part of this rulemaking. One commenter (0218) stated that, in addition to looking at the demographic census data, the EPA must assess the starting point or baseline "overall health" status of the affected individuals and communities, using the best available data at a local and national level, including the baseline cancer levels. The commenter suggested that the EPA should follow the recommendations of its own interim guidance and include in its analysis an assessment of the percent of the population with limited English proficiency, infant mortality, and low birth-weight births.

Two commenters (0218 and 0171) supported the EPA's decision to assess the demographics within 5 kilometers (or 3 miles) of affected sources. One commenter (0218) suggested that the EPA should also evaluate impact within a broader area, where it has information that there is potential for dispersion beyond the 3-mile radius. Three commenters (0161.1, 0218, and 0171) asked that the poverty statistics be updated to include 2010 census data, rather than relying on older information. The number of people in poverty in 2010 is the largest number in the 52 years for which poverty estimates have been published.[80]

Response: As noted in the response to comments above, per the EPA's interim guidance on EJ and the Action Development Process, the Agency is encouraging rule writers and policy makers to look at the whole range of factors that impact communities and population groups when crafting rules. In regards to how the Agency conducts its analysis, the EPA is continuing to discuss and pilot approaches that are consistent with the Agency's responsibilities regarding EJ as outlined in EO 12898. In determining the need for residual risk, the EPA strives to limit to no higher than 1 in 10 thousand (100 in 1 million) the estimated cancer risk for persons living near a plant if exposure to the maximum pollutant concentration for 70 years and to protect the greatest number of persons to a individual lifetime risk of no higher than 1 in 1 million. Considerations

[80] U.S. Census 2011. *Income, Poverty, and Health Insurance Coverage in the United States: 2010*. Available online at: *http://www.census.gov/prod/2011pubs/p60-239.pdf*.

are made for all people regardless of racial or socioeconomic status. In response to the comment on the need to assess impacts beyond a 3-mile radius, the EPA agrees that it is helpful sometimes to analyze a larger potential impact area. The EPA typically uses a radius of 50 kilometers (31 miles) for the purpose of residual risk analyses.

52. Comment: Commenter 0218 asked that, as part of providing sufficient information to affected local communities, the EPA should publish a plain-language statement of the health risks and benefits from EPA's final action, and in future rule proposals. The commenter stated that, although it provides the MIR and chronic and risk numbers, these are not easily understandable by the general public. The commenter asked for expanded discussion of health disorders or other adverse effects, stating that, without a full discussion of health impacts and risks, it is difficult for the public to provide meaningful comment on the impact this proposal will have on their lives, which is an EJ issue.

The commenter also asked that the EPA provide a statement and analysis in this residual risk rulemaking (and all others) on the real world impacts of EPA's rulemaking, so that the public has a clear understanding of what the risk is, and precisely what types of harm to public health EPA is determining are "acceptable" and "unacceptable." The commenter believes that this is needed to inform EPA's and the public's consideration of what level of risk is acceptable or unacceptable, and what standard is required to provide an ample margin of safety.

Response: The EPA agrees that providing sufficient information is important, so affected communities have a meaningful opportunity to participate in EPA rulemakings. It is the EPA's goal to use plain language in all rule preambles and risk assessments so that they are understandable to the general public. As future preambles, fact sheets, and assessments are written, we welcome input on how the health discussion should be expanded and how the risk numbers and critical concepts like "ample margin of safety" can be set in a context that is easier to understand.

For this rule, there is additional health information contained in the docket,[81] and EPA has provided the contact information (in the rule preamble) for the technical experts who can be contacted for assistance in understanding this rule and the risk modeling that was conducted.

53. Comment: Two commenters (0162 and 0196) objected to EPA's accounting for EJ in developing the proposed rule, *i.e.*, whether "there is an overrepresentation of minority, low income, or indigenous populations near the sources such that they may face disproportionate exposure from pollutants that could be mitigated by this rulemaking" (76 FR 81353). The commenters noted EPA's conclusion that the rule will not have such effects because "it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority, low income, or indigenous populations." However, the commenters argued that EPA is without authority to factor such EJ considerations into this rule, because the term "public health" cannot reasonably be interpreted to include consideration of EJ in the context of section 112(f). According to the commenters, section 112(f)(2)(A) expressly instructs

[81] See U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category* among other RTR-related documents, in the docket for the subpart S rulemaking.

EPA to impose additional emissions controls if needed to provide an ample margin of safety "to protect public health." The commenters noted that the term "public health" is not defined in section 112 or in EPA's Part 63 regulations.

The commenters (0162 and 0196) noted that, for EPA's NAAQS program, the Supreme Court has observed that the "primary definition of the term" should be applied, *i.e.*, that public health means "the health of the public." *Whitman v. American Trucking Associations, Inc.*, 531 U.S. 457, 465 (2001). According to the commenters, this conclusion emphasized that the scope of the term "public health" should be dictated by the meaning of the word "public." To illustrate, the commenters cited Webster's Dictionary, which defines the adjective "public" to mean "of, relating to, or affecting all of the people or the whole area of a nation or state" and "of or relating to people in general." The commenters pointed out that these definitions emphasize that the word "public" should be construed expansively as describing the people as a whole, and not particular demographic segments.

The commenters asserted that EPA's established approach to assessing potential impacts on public health under the NAAQS program is consistent with this meaning. According to the commenters, EPA reasonably interprets the term "public health" to include consideration not only of potential impacts to the population as a whole, but also to sensitive subpopulations – recognizing that the objective is to protect the group rather than any particular individual in the group (*e.g.*, 71 FR 61144, 61145 fn. 2 (Oct. 17, 2006)). The commenters noted that sensitive subpopulations are identified according to their particular health-based sensitivities (*e.g.*, asthmatics) rather than demographic classifications unrelated to particular health-based sensitivities (*e.g.*, population without a high school diploma).

The commenters further argued that, with this backdrop, it would not be reasonable to construe the term "public health" as used in section 112(f) as allowing consideration of demographic classifications that bear no relationship to the potential health effects presented by the HAPs at issue for the given source category or subcategory. According to the commenters, EPA's proposal would unreasonably inject racial, ethnic, economic, and other policy considerations into a program designed to provide protection for the public at large. To illustrate, the commenters stated that, if EPA were to suggest that the population without a high school diploma should receive extra scrutiny, it raises the question why EPA should not afford the same scrutiny to other reasonably definable educational groups, such as those with a high school diploma, those with college degrees, and those with advanced degrees. According to the commenters, there is simply no principled way to identify and define those groups that should receive extra scrutiny from those that do not. To conclude, the commenters argued that injecting EJ considerations into section 112(f) standard setting would inappropriately cause arbitrary policy and political considerations to trump objective scientific analysis, which would be patently unreasonable and, as such, would not be a supportable interpretation of section 112(f).

Response: As described above, the Agency is directed by EO 12898 to make EJ part of our mission. The EPA disagrees that the term "public health" cannot include consideration of EJ. The EPA defines EJ to mean fair treatment and meaningful involvement of *all* people, and this definition represents a commitment to ensuring that EPA works to improve conditions affecting the public health of all Americans so that everyone has access to clean water, clean air and healthy communities.

As stated in the Benzene NESHAP, in determining the need for residual risk standards, we strive to limit to no higher than approximately 1-in-10 thousand (100 in a million) the estimated cancer risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years and, in the ample margin of safety decision, to protect the greatest number of persons possible to an individual lifetime risk level of no higher than approximately 1-in-1 million. These considerations are made for all people, regardless of racial or socioeconomic status. While we analyzed the demographic makeup of the at-risk populations surrounding the facilities within the source category addressed by this rulemaking, we ultimately concluded that the risks were acceptable for all population groups and protected public health with an ample margin of safety. Thus, while the results of our demographic analyses served to provide information about the demographic makeup of the populations exposed to the source category, the EPA did not base its decision solely on these analyses.

3. Technology Review

54. Comment: Commenter 0218 stated that the EPA did not consider the full range of control options available and arbitrarily relied on unsupported assumptions for the options it did consider. The commenter stated that the EPA's analysis of available controls failed to include practices, processes and technologies that have achieved greater emission reductions and dismissed options with little or no analysis or support. The commenter recommended that the EPA should have researched vendor literature and discussed options with vendors regarding newer technologies and improvements to old technologies that make them more cost-effective and efficient, and could have consulted with the pollution control technology industry, including the Institute of Clean Air Companies (ICAC), and other national, state and local jurisdictions' air pollution control agencies.

The commenter stated that EPA's standards do not reflect the actual emission levels achieved by the relevant best performers. The commenter recommended that the EPA set revised standards that meet the test under section 112(d)(2) and (d)(3), by setting a MACT floor that does reflect the emission levels achieved by the relevant best performers (those with the lowest emissions) and beyond-the-floor standards reflecting the maximum achievable degree of reduction in each of the hazardous air pollutants that the category emits.

Response: As promulgated, the pulp and paper MACT (subpart S) standards include emissions standards for pulping system vents, kraft pulping process condensates, and bleaching system vents. The commenter is incorrect in their statement that the full range of controls was not considered in the technology review of subpart S. Contrary to the consultations which the commentator suggests we avoided, EPA performed a thorough evaluation of new pollution control technology by analyzing nearly 100 entries in the Reasonable Available Control Technology/Best Available Control Technology/Lowest Achievable Emission Rate (RACT/BACT/LAER) Clearinghouse (RBLC) database[82] for pulp and paper sources and reviewed the European Commission's December 2010 reference document[83] on the best available control techniques in the pulp and paper industry. We also conducted a thorough review of control technology information from the 2011 Part I survey responses, which would be expected to include information on the same practices, processes, and technologies that pollution control vendors and state and local air pollution control agencies would have provided.[84] Consequently, we contend that we have met the CAA section 112 (d)(6) requirement to review the latest practices, processes and control technologies being used and available for use in subpart S sources. We also note that the commenter did not identify any particular technological developments (other than TCF bleaching, which we discuss below) that we would have discovered if we had looked beyond the comprehensive information sources we reviewed.

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[82] See memorandum from T. Holloway and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA, titled *Summary of RBLC and Other Findings to Support Section 112(d)(6) Technology Review for Pulp and Paper NESHAP*, September 30, 2011, in the docket for the subpart S rulemaking.

[83] See European Commission document, titled *Integrated Pollution Prevention and Control (IPPC): Reference Document on Best Available Techniques in the Pulp and Paper Industry*, Draft April 2010.

[84] See memorandum from K. Hanks and T. Holloway, RTI, to J. Bradfield and B. Schrock, EPA, titled *Section 112(d)(6) Technology Review for Pulping and Papermaking Processes*, November 16, 2011, in the docket for the subpart S rulemaking.

Notwithstanding the fact that we did not identify any new technologies in our review, the commenter indicates that had we identified new technologies, we would have been obligated to conduct another section 112(d)(2) and (d)(3) MACT floor setting exercise. As we have noted previously, we do not accept that we are obligated to do a section 112(d)(2) and (d)(3) analysis under a section 112(d)(6) technology review requiring a reanalysis or recalculation of MACT floors. See proposed National Emission Standards for Coke Oven Batteries (69 FR 48388, 48351 (August 9, 2004)). Instead, we interpret section 112(d)(6) as essentially requiring us to consider developments in pollution control in the industry (''taking into account developments in practices, processes, and control technologies''), and assessing the costs of potentially stricter standards reflecting those developments. We read this provision as providing the EPA with substantial latitude in weighing these factors and arriving at an appropriate balance in considering revisions to our standards. This discretion also provides us with substantial flexibility in choosing how to apply modified standards, if necessary, to the affected industry.

55. Comment: Commenter 0218 asserted that near-zero air-discharge pulp and paper facilities exist and are common in Europe. (The commenter cited two European Commission reference documents on best available techniques in the pulp and paper industry.) The commenter mentioned a process that uses modified cooking plus oxygen delignification, and uses only ozone and peroxide to bleach, which results in zero discharge of chlorine dioxide (ClO_2) and chlorinated organic substances measured as adsorbable organic halides (AOX). The commenter argued that, while EPA notes that some facilities in the U.S. use totally chlorine free (TCF) processes, it fails to rationally explain why TCF processes were not considered the MACT floor for pulp and paper facilities. Further, the commenter stated, the technology is now mature, with 25 percent of the European paper supply made of TCF paper, and represents the least toxic alternative, and the European Union (EU) requires near-zero discharge processes–ECF bleaching with low AOX, or TCF bleaching – as Best Available Technology. The commenter stated that the EPA's failure to require modified cooking, oxygen delignification, and ozone and peroxide bleaching is arbitrary and capricious under section 112(d)(6).

Response: The European Commission reports that ozone and peroxide bleaching can be used when modified cooking and oxygen delignification are used as bleaching pretreatments, and these processing steps result in zero discharge of Cl_2 and AOX compounds. The Commission does not, however, report the wood species and type used in this process or either the source or the end use of the pulp made with this process. When virgin fiber is pulped, lignin content (chemical structure and amount) varies significantly based on wood type and species, and the aforementioned process is not applicable to all species of wood. The ozone and peroxide bleaching processes are lignin-chemical-structure-specific and do not react with all structures and result in a final product with lower brightness. The process would be appropriate if the final product was toilet paper, but would not be appropriate for printing and writing grades. These grades require complete lignin removal. When recycled bleached fiber is pulped, lignin has typically already been removed, and ozone/peroxide bleaching should be sufficient to brighten a recycled pulp—a pulp that was initially bleached with chlorinated compounds. Extended cooking and oxygen delignification would be required for virgin fibers that undergo an ozone- and peroxide-only bleaching process, which would result in lower pulp yields and, thus, higher raw material costs. It would also generate higher amounts of black liquor solids that require processing in the recovery furnace. In older facilities such as those in the U.S. (as compared to the newer ones in Europe), recovery furnaces are commonly running at capacity and could not

support the burning of additional solids. Where capacity is available, burning higher amounts of black liquor solids would result in additional negative secondary emission impacts (higher carbon monoxide [CO], nitrogen oxides [NO_X], sulfur dioxide [SO_2], and particulate matter [PM]) subsequent to such a change in bleaching technology.

The EPA investigated the use of TCF and ECF processing during the technology review. In the same document to which the commenter refers, the European Commission reports that effluent from the TCF process is not significantly different from the ECF process, and it notes that the use of a TCF process requires the removal of metals in pulps using chelation, which results in the use of non-biodegradable, potentially hazardous metal compounds that must be landfilled. The TCF processes currently used in the U.S. are used with secondary or mechanical pulps, not virgin kraft pulps. The tree species used to produce virgin kraft pulp in the U.S. do not efficiently respond to ozone and peroxide bleaching without the use of ClO_2 to reach consumer-required final product brightnesses.

Oxygen Delignification (O2Delig) is encouraged by the current subpart S standards because bleaching requirements are reduced through the use of O2Delig and, therefore, the pollution control requirements (99+ percent control) and costs are reduced. The costs for O2Delig were given extensive "beyond the floor" attention in the evaluations for the original Cluster Rule, which combined the subpart S MACT rules with new pulp and paper effluent guidelines under the Clean Water Act (CWA). Specifically, O2Delig was evaluated because of its positive impact on wastewater treatment requirements. However, the beyond-the-floor evaluation did not justify requiring O2Delig as part of the Cluster Rule. We are only conducting a review of the subpart S MACT (air) rule promulgated under Cluster Rule, so a new O2Delig analysis was not deemed appropriate. Similarly, TCF was evaluated under the Cluster Rule for its positive impact on wastewater treatment and as a beyond the floor technology, but was not found to be justified. As with O2Delig, we set up the standards in the original rule to encourage TCF bleaching through the use of targeted exemptions, which remain in place following this technology review. AOX was only addressed in the water rules promulgated under the Cluster Rule and was reduced through the use of limitations on chlorinated bleaching, which also remain in place following our review of the bleaching system MACT requirements.[85,86]

As the commenter stated, only about 25 percent of the European paper supply is made of TCF paper, showing that the processing is not applicable to all papermaking processes. The statement that the EU requires near zero-discharge processes is not relevant to this action, as subpart S is an air rule, not a water rule. The U.S. required that the industry convert from Cl_2 bleaching to ECF or TCF bleaching with the original Cluster Rule, and the explanation as to why EPA did not require modified cooking, O2Delig, and ozone and peroxide was discussed in the original subpart S rule (63 FR 18504) and is not applicable to many processes in the U.S. Therefore, the purported "failure to require modified cooking, oxygen delignification, and ozone and peroxide bleaching" (according to the commenter) is not supported by the record and should not be considered arbitrary and capricious under section 112(d)(6).

[85] See memorandum from K. Spence and J. Bradfield, EPA, to Docket EPA-HQ-OAR-2007-0544, titled *Summary of Pulp Bleaching Technology Review*, November 22, 2011, in the docket for the subpart S rulemaking.
[86] See *Pulp, Paper and Paperboard Industry – Background Information for Promulgated Air Emission Standards Final EIS; EPA-453/R-93-050b.*

3.1 EPA's Authority under CAA Section 112(d)(6)

56. Comment: Commenter 0218 stated that section 112(d)(6) serves as an on-going ratchet to continually require the EPA to update standards to keep pace with new technology in order to decrease emissions. The commenter observed that section 112(d)(6) requires EPA to revise its MACT "floor" in accordance with section 112(d)(2)-(3) and (6), to ensure that the standards continue to satisfy the requirements of section 112(d)(2)-(3), particularly where there are "developments" in technology, practices, and processes demonstrating that greater emissions reductions are "achievable" and sources have achieved significantly lower level of emissions "in practice" than the current MACT standards. The commenter found the EPA's narrow reading of the term "developments" as unlawful and arbitrary. The commenter asserted that EPA failed to conduct a comprehensive evaluation of advances in control technologies, practices, and processes that may have achieved greater emission reductions than at the time of the original standards. The commenter recommended that the EPA look to jurisdictions with the most stringent standards for HAP emissions to gather data from facilities and information about control systems that are attaining the highest control efficiencies, because these stronger standards and permit limits for a similar source category are evidence that lower emission levels are being achieved and can be achieved, and are thus "developments" that EPA must consider under section 112(d)(6).

The commenter stated that control technology is only one factor in determining emissions levels of the best performing similar sources, according to the commenter, and other factors, such as fuel inputs and raw materials, must also be part of the best performing similar source determination. The commenter asserted that, for the pulp and paper source category, significant evidence demonstrates that, due to improvements in technology, many sources have "achieved" a level of "actual" HAP emissions that is not only below the existing MACT standard, but also below the standards proposed by EPA in the new rule.

According to the commenter, EPA itself notes that—[f]acilities' actual emissions may also be significantly lower than MACT-allowable emissions for other reasons such as state requirements, better performance of control devices or reduced production.[87] The EPA's analysis of its emissions inventory for pulp and paper facilities indicates that the amount of emissions that are "allowable" under the existing MACT standard exceed estimated (what EPA calls "actual") emissions and may be almost three times the "actual" emissions.[88] In particular, the reported average actual performance level for percent reduction in kraft pulping process condensates is 95 percent–fully 1 percentage point higher than EPA's proposed revised standard of 94 percent. The EPA itself concluded that "there were mills performing better than the 92 percent minimum and that the great majorities [sic] were performing significantly better."[89]

The commenter concluded that, under section 112(d)(6), EPA must revise the existing MACT based on these developments and meet the requirements of section 112(d)(2)-(3), by

[87] See 76 FR 81,328, 81,334 (emphasis added).
[88] See memorandum from T. Holloway, K. Hanks, C. Gooden, and M. Hakos, RTI, to J. Bradfield and B. Schrock, EPA, titled *Inputs to the Pulp and Paper Industry October 2011 Residual Risk Modeling*, Table 6B, November 11, 2011, in the docket for the subpart S rulemaking.
[89] See memorandum from J. Bradfield and K. Spence, EPA, to Docket EPA-HQ-OAR-2007-0544, titled *Summary of Clean Condensate Alternative Technology Review*, October 23, 2011, in the docket for the subpart S rulemaking.

setting standards more stringent than what EPA has proposed in this rulemaking; otherwise, the commenter asserted that EPA's CAA section 112(d)(6) review of the existing section 112(d) standards was unlawful and incomplete.

Response: The commenter is mistaken on several grounds. First, the commenter asserted that "the EPA recognizes that certain sources have 'achieved' a level of 'actual' emissions that is below the level allowed under the existing MACT standards" and cited the proposed rule preamble at 76 FR 81334. The EPA statement cited by the commenter was a qualitative, introductory statement about how NEI and other sources of data typically contain estimates of actual emissions that are "often" lower than allowable emissions. The statement was not specific to pulp and paper facilities or data and, in any event, did not contain any quantitative determination about actual emissions levels.

Second, the commenter asserted that the EPA must use information suggesting that sources are operating at less than allowable emissions under CAA section 112(d)(6) to revise MACT standards, including recalculating MACT floors under section 112(d)(2)-(3). The commenter apparently is referring to the MACT allowable-to-actual emissions ratio developed for this rulemaking. The commenter is incorrect in characterizing this ratio as a determination of the level of actual emissions achieved in practice for the source category. The actual-to-allowable ratio represents the lowest amount of HAP compared to the maximum allowed under the MACT. The allowable ratio is used for providing a worst-case scenario for estimating allowable emissions from the source, considering the compliance margin used by sources to account for variability in emission.

Third, the commenter is incorrect in asserting that the EPA must recalculate MACT floors under CAA section 112(d)(2)-(3). As explained in prior RTR rulemakings, the EPA does not read section 112(d)(6) as requiring a reanalysis or recalculation of MACT floors. See proposed National Emission Standards for Coke Oven Batteries (69 FR 48388, 48351 (August 9, 2004)). Instead, we interpret section 112(d)(6) as essentially requiring us to consider developments in pollution control in the industry ("taking into account developments in practices, processes, and control technologies"), and assessing the costs of potentially stricter standards reflecting those developments. We read this provision as providing the EPA with substantial latitude in weighing these factors and arriving at an appropriate balance in considering revisions to our standards. This discretion also provides us with substantial flexibility in choosing how to apply modified standards, if necessary, to the affected industry.

For this rulemaking, an ICR was used to obtain much of the information used in EPA's technology review. (We also reviewed nearly 100 entries in the RBLC database[90] for pulp and paper sources and reviewed the European Commission's December 2010 reference document[91] on the best available control techniques in the pulp and paper industry.) Our review was not limited to applicable control technologies. The EPA reviewed other potential developments in practices, processes, and control technologies for the pulp and paper source category and

[90] See memorandum from T. Holloway and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA titled, *Summary of RBLC and Other Findings to Support Section 112(d)(6) Technology Review for Pulp and Paper NESHAP*, September 30, 2011, in the docket for the subpart S rulemaking.

[91] See European Commission document, titled *Integrated Pollution Prevention and Control (IPPC): Reference Document on Best Available Techniques in the Pulp and Paper Industry*, Draft April 2010.

evaluated costs of potentially more stringent standards reflecting any such developments. This review and the revisions finalized in this rulemaking satisfy the EPA's obligations under CAA section 112(d)(6) for the pulp and paper source category.

57. Comment: Commenter 0172 did not believe that EPA had the legal authority to revise the condensate destruction standards in §63.446(e)(3), (e)(4) and (e)(5). As described by the American Forest and Paper Association (AF&PA) in their comment on the proposed rule, there have been no "developments in practices, processes and control technologies" that would justify a revision of these standards.

Response: We disagree with the commenter's interpretation of our legal authority. As noted above, we interpret section 112(d)(6) as requiring us to consider all developments in practices, processes, and control technologies in the industry. When we take into account the "developments in practices, processes, and control technologies," we interpret that language as providing for EPA to not only to evaluate new control technologies and process improvements but also to evaluate the application of the control technologies that were the basis for the current MACT floor. In that evaluation we examine whether, in the 'practice' of applying the MACT standard technology, there have been technological advances. Generally, we consider whether the MACT floor technology, in practice, is performing better than anticipated in the original MACT floor analysis. Indeed, we did not find in our evaluation of data received in the ICR conducted prior to proposal that there were significant modifications to the basic kraft pulping process or new technologies for control of condensates. In the proposal, our initial evaluation indicated that kraft condensate control (using the technologies originally anticipated) had improved since promulgation based on the information showing emissions control higher than the 92 percent standard. Consequently, we proposed to raise the treatment standard from a 92 percent control basis to a 94 percent basis.[92]

In the final rule, however, we are not increasing the treatment standard, for the reasons discussed in the final rule preamble, in a memo prepared for the final rule,[93] and elsewhere in this response-to-comments document.

3.2 Chemical Pulping Standards

58. Comment: Commenters 0162 and 0163 agreed with EPA's determination that "there have been no advances in emission control measures [for chemical pulping] since the subpart S standard was originally promulgated in 1998" (76 FR 81344). According to commenter 0162, the technology currently used by the industry for subpart S compliance is the same as when the rule was promulgated. Commenter 0162 stated that these systems have the same capabilities as the units that were used by the "best performing" mills that were the basis for the MACT "floor."

[92] See memorandum from J. Bradfield and K. Spence, EPA, to Docket EPA-HQ-OAR-2007-0544, titled *Summary of Kraft Condensate Control Technology Review*, October 23, 2011, in the docket for the subpart S rulemaking.
[93] See memorandum from C. Gooden, K. Hanks and T. Holloway, to J. Bradfield and B. Schrock, titled *Costs, Environmental, and Energy Impacts for the Promulgated Subpart S Risk and Technology Review*, May 11, 2012, in the docket for the subpart S rulemaking.

Response: We acknowledge the commenters' support for our conclusion that there have been no advances in emission control measures for chemical pulping vents since the subpart S standard was originally promulgated. Our conclusion was based on our review of available information, including the 2011 Part I survey responses from the pulp and paper industry, information on pulp and paper control techniques in the RBLC, and the EU document on best available techniques in the pulp and paper industry.[94]

59. Comment: Commenter 0218 declared that the EPA did not consider the full range of control options available for kraft pulping. The commenter pointed to evidence in the record (Summary of Clean Condensate Alternative Technology Review (EPA-HQ-OAR-2007-0544-0129)) as demonstrating that greater reductions of HAPs from the kraft process could be achieved by using clean condensate limits, and that using fresh steam in the chip bin of a continuous digester could reduce emissions. The commenter stated that the EPA had failed to consider the development of these techniques since its last MACT rulemaking and had failed to show that its standards reflect the actual emission levels achieved by the best performers under section 112(d)(3). The commenter concluded that the EPA must set stronger standards.

Response: The clean condensate alternative (CCA) was implemented to encourage greater reductions at lower regulatory cost than the HVLC control required under MACT. Mill processes and thus HVLC emissions are site-specific. One technology identified in a CCA plan, (*e.g.*, flash steam used in a chip bin) may be appropriate in one location, but is not necessarily available in all facilities. Generally, our analyses of CCA facilities indicated that the majority implemented unique options available to their specific location. Steam generation is an energy-intensive activity. A previous study has shown that a facility needs to generate 5,000 lb/hr of fresh steam (generally through the burning of fossil fuels) for chip bin pre-steaming, at an annual cost of $184,000.[95] The use of flash steam (generated from recovered process heat) in the chip bin reduces the need to produce fresh steam and the need to treat the gases. No new fresh steam is created, and the consequent boiler-generated HAP are avoided, and CCA credits can be generated. The EPA has also received comments indicating that heat balances are critical concerns in pulping operations but vary from mill to mill. Directing the use of steam was not considered to be an appropriate evaluation under this technology review since steam/energy balances are particularly mill-specific.[96] This requirement would also not be appropriate for the current standard, as the standard refers to all kraft pulping standards, which include batch and continuous operations. Batch operations generally do not use pre-steaming in the chip bin.

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[94] Additional details on our technology review are provided in docket memoranda, titled *Section 112(d)(6) Technology Review for Pulping and Papermaking Processes* and *Summary of RBLC and Other Findings to Support Section 112(d)(6) Technology Review for Pulp and Paper NESHAP* and the European Commission document, titled *Integrated Pollution Prevention and Control (IPPC): Reference Document on Best Available Techniques in the Pulp and Paper Industry.*

[95] See Rosemount, Inc., "Chip Bin Level Measurement Nets Savings Over $2.3 Million," 2008, available online at: *http://www2.emersonprocess.com/siteadmincenter/PM%20Rosemount%20Documents/00830-1300-4024.pdf*.

[96] See memorandum from J. Bradfield and K. Spence, EPA, to Docket EPA-HQ-OAR-2007-0544, titled *Summary of Clean Condensate Alternative Technology Review*, October 23, 2011, in the docket for the subpart S rulemaking

3.3 Bleaching Standards

60. Comment: Commenters 0162 and 0163 agreed with EPA's determination that "there have been no advances in emission control measures [for bleaching] since the subpart S standard was originally promulgated in 1998" (76 FR 81344). According to commenter 0162, the technology currently used by the industry for subpart S compliance is the same as when the rule was promulgated. Commenter 0162 stated that these systems have the same capabilities as the units that were used by the "best performing" mills that were the basis for the MACT "floor."

Response: We acknowledge the commenters' support for our conclusion that there have been no advances in emission control measures for bleaching since the subpart S standard was originally promulgated. Our conclusion was based on our review of available information, including the 2011 Part I survey responses from the pulp and paper industry, information on pulp and paper control techniques in the RBLC, and the EU document on best available techniques in the pulp and paper industry.[97]

61. Comment: Commenter 0218 stated that EPA did not consider the full range of control options available for pulp bleaching. The commenter noted that EPA's technology review reveals that EPA identified two facilities with BACT emission limitations requiring bleaching using no Cl_2 or ClO_2, or bleaching with only hydrogen peroxide, sodium hydrosulfite, and sodium borohydride.[98] According to the commenter, EPA flatly concluded, however, that the bleach plant chlorinated vent gas emissions are effectively controlled (99 percent), and that no amendment to current regulations is necessary despite EPA's conclusion that emissions from the bleaching process exceed 5 million lbs of toxic air pollution each year.[99]

The commenter stated that EPA did not consider use of environmental management systems (EMS) or best practices and benchmarking to minimize pollution. The commenter noted that the EU recognizes that "the best environmental performance is usually achieved by the installation of the best technology and its operation in the most effective and efficient manner."[100] As part of the continuous improvement mechanism embodied by EMS, sources could be required regularly to review all chemicals used in the pulp and paper processes. Replacement chemicals that are safer for the environment should be used if possible, and necessary chemicals that cannot be replaced with safer alternatives should be used in the lowest amounts practical. This process is considered a Best Available Technique to reduce pollution in Europe, and should be included in the MACT floor in the United States.

According to the commenter, many pulp and paper facilities in the United States already use continuous improvement mechanisms such as best practices and benchmarking to improve

[97] Additional details on our technology review are provided in docket memoranda, titled *Summary of Pulp Bleaching Technology Review* and *Summary of RBLC and Other Findings to Support Section 112(d)(6) Technology Review for Pulp and Paper NESHAP* and in the European Commission document, titled *Integrated Pollution Prevention and Control (IPPC): Reference Document on Best Available Techniques in the Pulp and Paper Industry.*

[98] See memorandum from K. Spence and J. Bradfield, EPA, to Docket EPA-HQ-OAR-2007-0544, titled *Summary of Pulp Bleaching Technology Review*, November 22, 2011, in the docket for the subpart S rulemaking.

[99] *Id.*, page 4.

[100] See European Commission document titled, *Integrated Pollution Prevention and Control Draft Reference Document on Best Available Techniques in the Pulp and Paper Industry*, Draft April 2010, at 82.

efficiency and decrease environmental impacts. The commenter asserted that EPA failed entirely to consider the reduction of air emissions possible using this control technique, despite evidence in the record of pollution prevention techniques used at pulp and paper mills in the United States.[101]

Response: The EPA's technology review identified two facilities with BACT emissions limitations that required bleaching without Cl_2 or ClO_2 or bleaching with only hydrogen peroxide, sodium hydrosulfite, and sodium borohydride. In the case of the facility that is not allowed to bleach with Cl_2 or ClO_2, the facility produces secondary pulp. This process requires pulp brightening which is different from bleaching, as it does not remove lignin. In the case of virgin kraft fibers, the lignin must be removed to obtain target final product brightnesses. In the case of the facility that can only process pulp using hydrogen peroxide, sodium hydrosulfite, and sodium borohydride, the facility is producing mechanical pulp, which also only requires brightening, not bleaching. These "bleaching" chemicals are not applicable to virgin kraft pulps. Bleach plant vent gas emissions are effectively controlled at 99 percent, and no advances in emission control measures for bleaching have occurred since the initial promulgation of subpart S in 1998.

The EPA did consider EMS, best practices, and benchmarking in the technology review. These systems are in place at many mills, but the scope of these systems is very mill-specific and, therefore, difficult to codify, much less allow quantification of the costs and emissions reductions associated with them. Best practices and EMS may be further investigated for the resolution of issues in a future rulemaking where work practices may be deemed appropriate.

3.4 Kraft Pulping Condensate Standards

3.4.1 General Comments on the Kraft Pulping Condensate Standards

62. Comment: Condensate Generation. Commenter 0162 explained that pulping process condensates contain varying concentrations of HAPs, of which methanol is the predominant HAP used as a surrogate in subpart S. These HAPs are apportioned throughout the process to the pulp, pulping liquors, condensates, and gas streams, also known as non-condensable gases (NCGs). Some methanol remains in the liquor and will be destroyed when the liquor is burned in the recovery furnace to recover sodium and sulfur. Throughout the process, water containing relatively low concentrations of methanol is sent to the wastewater treatment system (WWTS). For the purposes of compliance with subpart S, HAPs are collected from either the gases or condensates from the pulping and evaporator equipment. NCASI studied the generation and portioning of methanol during the development of the "Cluster Rule" (of which subpart S is the air portion), and NCASI Technical Bulletin 702 covers those details.

The commenter explained that processes at each mill are slightly different, and the differences affect the partitioning of methanol. The ability to treat condensates is governed by the fact that methanol has an affinity for water, and it takes a lot of energy/resources to drive methanol from the liquid phase. Therefore, of the condensates generated, only the concentrated

[101] See *Trip Report for Site Visit – GP Big Island, LLC* (EPA-HQ-OAR-2007-0544-0044) (discussing the facility's new substance review process).

condensate streams, generally above 2000 parts per million (ppm), which contain the overwhelming majority of the methanol, can be effectively treated in steam strippers.

The commenter stated that collecting and treating more process methanol results in greater and greater cost of destruction and makes less and less sense given the acceptable risk conclusion at current treatment levels. MACT was set at a more reasonable treatment efficiency and condensate collection rate because the systems that comprised the "floor" were designed almost entirely for odor control, and these decisions were made with a necessary mind towards reducing odor (and, therefore, methanol and other HAPs) cost effectively.

Response: We recognize that methanol is the predominant HAP contained in kraft condensates, that there is variability in methanol generation, that mills treat the highest-concentration condensate streams in accordance with subpart S (and for odor control). As discussed further below, we did not propose, and nor are we adopting, additional collection requirements. We have evaluated the performance criteria and variability of treatment systems typically used by facilities to assure compliance with the kraft pulping process condensate standards in §63.446. We have also reviewed the information provided by the commenter that supplements data collected in the ICR. The EPA has decided not to promulgate revisions to the kraft condensate standards upon further evaluation of the costs, energy, and secondary air emissions impacts associated with upgrading these systems. The commenter connects the conclusion of the section 112(f)(2) risk review with the proposal developed under the section 112(d)(6) technology review. Technology reviews require the consideration of technology changes in practices, processes and controls that have led to improved HAP control. As noted in the proposal, risk is not a factor in section 112(d)(6) considerations and was not here.

63. Comment: Condensate Collection and Treatment Compliance Options in the Original NESHAP. Commenter 0162 explained that the MACT standard was divided into two phases of implementation. Phase I set limits for condensate collection and treatment and also required collection and treatment of LVHC NCG streams. During Phase II, mills were required to collect and treat HVLC NCG streams.

The commenter summarized that, in 1993, there were 32 mills with steam strippers, and the top 15 were used to develop the MACT "floor" (top 12 percent of all 125 mills that were covered by the rule). The commenter noted that the top 15 mills were all bleached mills. The commenter explained how an NCASI study documenting HAP collection and treatment at all sources (NCASI Technical Bulletin 661) identified that the best performing 15 mills collected on average 11.1 pounds per oven-dried ton of pulp (lb/ODTP) of methanol and achieved a treatment efficiency of 92 percent. Based on the average collection of methanol by the top 15 strippers, EPA developed the collection standard of 11.1 lb HAP/ODTP, with methanol being the surrogate for HAPs. (See §63.446(c)(3).) The standard was adjusted to 7.2 lb HAP/ODTP for unbleached mills, given that unbleached mills generate methanol at a rate that is 64 percent of the rate at which methanol is generated by bleached mills. (See NCASI Technical Bulletin 702.)

The commenter stated that the two primary methods for condensate treatment are (1) steam stripping and (2) biological treatment. At the time the "Phase 1" requirements of the subpart S rule were being developed, the technology used by most mills that had condensate treatment was steam stripping. Given the affinity of methanol to water and the fact that the

condensates could be effectively treated by the active organisms in existing ASBs, biological treatment of the condensates, along with other mill wastewaters, was identified as a feasible alternative to attain a similar level of HAP reduction.[102] The condensates had to be transported in a hardpipe and introduced below the surface of the treatment system in order to minimize volatilization.

The commenter summarized that both the condensate collection and condensate treatment requirements in the subpart S rule were based on the average collection levels and performance of steam strippers at the best performing mills. As noted above, 11.1 lb HAP/ODTP was the average HAP collection of the "floor" steam strippers. As this was an average collection, it was noted that not even all "floor" mills could achieve a collection standard of 11.1 lb HAP/ODTP for bleached mills. Therefore, the "named streams" approach was developed. The "named streams" are locations where volatile HAPs are generated in concentrations that can be effectively treated.

To meet the condensate collection requirements for Phase 1, mills could either:

- Collect 11.1/7.2 lb HAP/ODTP (bleached/unbleached) from named streams, or
- Collect all "named streams" (it was noted that some mills could not generate the amount of methanol in the lb/ODTP standard), or
- Collect 65 percent of HAPs contained in pulping, turpentine recovery, and evaporator systems (based again on the average collection of "named streams" by "floor" mills) plus all HVLC/LVHC condensates.

(See §63.446(c).) The commenter noted that all these options required collection of "named streams" as identified by the rule (*i.e.*, a mill could not take credit for collecting "unnamed streams").

In addition to collection options, the commenter noted that the current subpart S rule offers four treatment options. These options were again developed based on the "floor" mills' performance in treating an average of 92 percent in their steam strippers and the outlet concentration of those units. The options provided to treat the collected streams are:

- Reduce or destroy at least 92 percent by weight of the collected HAPs, or
- Remove or destroy at least 10.2 or 6.6 lb HAP/ODTP (bleached/unbleached mills), or
- Remove or destroy so the control device outlet HAP concentration is at or below 330/210 parts per million by weight (ppmw) (bleached/unbleached), or
- Recycle condensates to an enclosed treatment system.

(See §63.446(e).) The commenter stated that, based on these requirements, facilities designed systems to comply with the standards with an inherent margin of safety to ensure

[102] Most aerated stabilization basin (ASB) systems—the most common type of wastewater treatment systems at pulp mills--are more difficult to operate to achieve a 92 percent destruction efficiency than steam strippers, but they also require less routine downtime for maintenance than steam stripper technology and at less cost. The lb/ODTP treatment option accommodates lower treatment efficiencies if more condensate is collected and treated. These options grew out of the cooperative Cluster Rule effort after industry advanced wastewater treatment as an equally effective treatment system with lower energy requirements and downtime. Cooperative thinking is what led to the flexible structure inherent in the Cluster Rule and the relative "near-uniqueness" of individual mill compliance systems – equivalent control with the most practical design given conditions and constraints of individual mills.

continuous compliance, given both process and control device variability. In other words, mills designed systems to achieve some level of control beyond what was required by the rule in order to ensure a compliance margin and demonstrate compliance at all times (99 percent+ compliance probability). The commenter stated that this is why it is not surprising for the average treatment performance to exceed the levels required by the current standards.

Response: We thank the commenter for their synopsis of how the condensate standards in the original subpart S rule were developed. We note that one of the 15 mills used in the MACT floor was a combination bleached and unbleached mill and another was a semi-bleached mill.

64. Comment: Clean Condensate Alternative. Commenter 0162 explained that the MACT I Phase 2 required collection of HVLC gases from brownstock washer systems, oxygen delignification systems, and some deknotters, screening systems, and deckers. As the cost to collect these gases was high (high volume means larger piping systems and control devices that can handle the volume), the Agency developed the CCA. This option allowed a mill to collect and treat additional condensates (named or unnamed streams) in order to achieve emissions reductions equivalent to those required from "Phase 2" of the rule for control of HVLC systems. (See §63.447.)

Facilities demonstrating compliance using CCA had to quantify emissions under a baseline scenario that reflected MACT I Phase I compliance. Facilities were not allowed to take credit for emission reductions resulting from compliance strategies chosen for MACT I Phase 1. For example, consider a bleached mill complying with the 11.1 lb HAP/ODTP collection requirement and demonstrating the need for 10 percent over-collection (12.21 lb/ODTP) in order to increase compliance probability and establish averaging times. Subsequently, this level of collection would be treated as the baseline for CCA, and the mill would have to achieve additional and surplus emissions reductions to offset not collecting the HVLC streams identified in the rule, if additional condensates were chosen to be collected and treated under the mill-specific CCA compliance program.[103] In order to demonstrate compliance under this option, in this example, a mill would have to collect additional condensates over the example 12.21 lb HAP/ODTP baseline and achieve an emissions reduction equivalent to the emissions reductions that would have been achieved by controlling the HVLC sources identified in Phase 2. A more complete example of an approach to CCA was described in Attachment 6 provided with comment 0162.

Response: We thank the commenter for their overview of the rationale for the CCA standards included in subpart S, and for the example CCA compliance option provided in Attachment 6 to their comment (0162).

65. Comment: Setting a HAP-Specific Standard instead of a Total HAP Standard. Commenter 0218 objected to the EPA's proposed total HAP standards for kraft condensates, stating that section 112(d)(6) requires EPA to control each emitted HAP. The commenter

[103] See letter from R. Douglas Neeley, EPA Region IV, to Larry Webber, Georgia EPD, March 27, 2003. "Any extra streams or additional mass of condensate used as an operating cushion, or for determining the need for flexibility provided by a longer averaging time, cannot be used as credit for the CCA, since it was granted and used to meet the collection requirements of § 63.446."

asserted that the EPA had not stated that it was using total HAP as a surrogate for all emitted HAPs, as required, in order to be able to meet the test for a surrogate. The commenter further argued that the EPA had not demonstrated that total HAP is a valid surrogate, which would require that:

1. The target HAP is "invariably" present in the surrogate pollutant;
2. Methods to control or capture the surrogate pollutant "indiscriminately" control or capture the target HAP as well; and
3. The controls for the surrogate are the "only means" by which facilities "achieve" reductions of the target HAP.

The commenter also stated that it was unclear if the EPA had considered other means that plants use to reduce each HAP, such as the use of cleaner raw materials, different processes, or control technologies.

The commenter observed that there is an extremely long list of pollutants emitted by the pulp and paper source category, ranging from methanol, acetaldehyde, formaldehyde, benzene, glycol ethers, and POM to cadmium, lead, nickel, mercury, and manganese. The commenter stated that, considering this broad range of emitted pollutants, EPA cannot simply assume that the kraft condensate standards will appropriately control all HAPs simply because it has set a total HAP standard.

Response: Methanol was selected as the surrogate compound for measuring total HAP for most control devices since it is the predominant HAP in process vent and wastewater streams. Compliance demonstration based on methanol was found to be sufficient and meet the noted surrogacy requirements for gaseous streams. However, the 1998 final rule specified that <u>total</u> HAP must be measured when demonstrating compliance using biological treatment (or the CCA) for pulping process condensates. In the 1998 final rule, EPA explained that:[104]

> "Because methanol is one of the most difficult HAPs to remove with a steam stripper (the technology on which the standards are based), even greater removals of total HAP would occur when a steam stripper is used. Thus, methanol is a reasonable surrogate under such conditions. The opposite is true for biological treatment systems, where methanol is one of the easier HAPs to degrade. As such, the final regulation specifies that a total HAP removal (not just methanol) of 92 percent be achieved by biological treatment systems."

The 1998 final rule did not refine EPA's definition of total HAP for this category. Additional data to establish a specific list of the 188 HAPs for compliance testing became available following promulgation of the 1998 final rule. NCASI submitted to EPA a study[105] that showed that the regulated condensate streams contain a finite number of measurable HAPs. The NCASI data reported that the HAP compounds with concentrations greater than 1 ppmw in regulated condensate streams are methanol, methyl ethyl ketone (MEK), acetaldehyde, and propionaldehyde; and that methanol accounts for approximately 98.5 percent of the total HAP

[104] See 63 FR pages 18511 and 18524, April 15, 1998.
[105] *Hazardous Air Pollutants Present in Kraft Mill Condensates and their Significance for the Hard-piping Option under Maximum Achievable Control Technology (MACT)*, December 1998. Docket No. A-92-40, Item No. VI-D-1.

mass, with acetaldehyde, MEK, and propionaldehyde accounting for the remaining 1.5 percent. Therefore, on January 25, 2000, we proposed a procedure (the "methanol procedure") for use as an alternative to demonstrating compliance of biological treatment systems on an individual HAP basis. As part of the methanol procedure, mills were required to measure the ratio ("r") of non-methanol HAP (acetaldehyde, MEK, and propionaldehyde) mass to methanol mass.(65 FR 3911) This procedure was finalized on December 22, 2000 (65 FR 80755).

Our analyses have satisfied the criteria listed by the commenter. We note that compliance equations discount any control of non-methanol HAP unless it can be demonstrated directly. In other words, mills often over-control methanol to demonstrate compliance if they cannot demonstrate destruction of non-methanol HAP in condensate streams. We also note that HAPs are primarily generated at pulping operations from the wood raw material, not solvents or additives, so those criteria is not applicable here.

66. Comment: Commenter 0163 requested a public announcement of a new proposal if EPA were to reanalyze the ICR data and reach another set of proposed conclusions about some incremental improvement in overall HAP reduction, so that an opportunity to comment is afforded. The commenter noted that they would expect for any proposal to discuss rule provisions for adjusting averaging times, since averaging time is critical for achievability of a condensate collection standard and also must be considered directly linked to the treatment standard. The commenter noted that EPA would also need to consider the need for mills to develop achievable strategies for adequate compliance margin in any adjustment of the standard it proposes.

Response: We have reanalyzed the ICR data and considered information provided by commenters that supplements data in the ICR. Based on our review, we have decided not to revise the kraft condensate standards at this time. No new proposal is required.

3.4.2 Technology, Proposed Numerical Limits, and Variability Associated with Kraft Condensate Collection and Treatment

67. Comment: Kraft Condensates Standard Insufficiently Stringent. Commenter 0218 stated that, although EPA did recognize that current processes and controls are capable of achieving greater reductions, EPA failed to set a standard that satisfies section 112(d)(6) or section 112(d)(2)-(3). The commenter observed that, while the EPA found that only 15 mills would need to improve their efficiency under the new 94 percent control of total HAP from kraft condensates, EPA found that of 171 mills, more than 100 would not be affected by updating the standard to 98 percent–presumably because they are already achieving that level of control. The commenter noted that the EPA still only proposed a 94 percent standard because of cost ($4 million per year, or $1,000 per ton of HAP control cost effectiveness).

The commenter cited two reasons why EPA failed to set an updated MACT floor based on the emission reductions achieved by the best-performing sources. First, the commenter stated that percent reduction standards are unlawful under section 112 because they do not reflect the emission level achieved by the best performing sources, just what EPA thinks can be achieved through the use of certain control technology. In support of this argument, the commenter cited the Portland Cement NESHAP (Sept. 9, 2010), Coal- and Oil-Fired Electric Utility Steam

Generating Units NESHAP (Feb. 16, 2012), and Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units NSPS, (Feb. 16, 2012) as examples of where the EPA has maintained that a percent reduction format negates the contribution of HAP inputs to source performance and "may be inconsistent with the D.C. Circuit Court's rulings as restated in the *Brick* case (479 F.3d at 880) which say, in effect, that it is the emissions achieved in practice (*i.e.*, emissions to the atmosphere) that matter, not how one achieves those emissions." The commenter emphasized that a percent reduction standard is inconsistent with and violates section 112's basic requirement to set standards based on the emission reductions achieved, regardless of the method used to do so. The commenter recommended that the EPA review each element of the standards that contains an unlawful percent reduction standard and perform the required analysis under section 112(d) to ensure emission reductions will occur based on what the best performers have achieved and based on what is now achievable.

Second, the commenter stated that, rather than setting a MACT floor based on the greater reduction levels achieved at the best performing units in accordance with section 112(d)(6) and section 112(d)(3), the EPA skipped the floor-updating step and proceeded to consider costs–a step that is only proper when setting limits "beyond-the-floor." The commenter, citing *National Lime Ass'n v. EPA*,233 F.3d 625, 640 (D.C. Cir. 2000); and *NRDC v. EPA*, 489 F.3d 1364, 1375-76 (D.C. Cir. 2007), argued that the MACT "floor" must be determined "without regard to costs or other factors and methods listed in section 7412(d)(2)." The commenter expressed concern that costs were a central component of EPA's analysis of achievable control, and stated that cost is not appropriate for reviewing and setting a MACT floor standard. The commenter urged the EPA to rectify this error in the final rule by considering reductions "achieved" and "achievable" from all "developments" in this sector, and setting the updated MACT standard pursuant to section 112(d)(6). The commenter concluded that failing to set a more stringent standard due to cost alone is unlawful and arbitrary and capricious.

Commenter 0218 further stated that, even if EPA could consider costs, its choice of a cost threshold was arbitrary and capricious. The commenter contended that even if EPA could skip the floor-setting process and proceed directly to set limits to provide an adequate margin of safety, its choice of a cost threshold was arbitrary and capricious. The commenter considered the EPA's determination of control efficiency for existing kraft condensate treatment to be minimal, when higher levels of control would also provide an adequate margin of safety at a reasonable cost. The commenter notes that for the Secondary Lead Smelting NESHAP, the EPA found a cost of $1.5 million per ton, or $750 per pound to be reasonable, a higher cost than a nationwide reduction of over 12,000 tons of HAPs per year from kraft condensate that is achievable at a cost of only $2,700 per ton.

Response: At the outset, the commenter indicated that the proposal overlooked the core information concerning the applicability of the proposed changes. There is a misunderstanding regarding the affected universe of kraft pulp and paper mills. There are 171 major sources, but only 97 of those have kraft pulping operations subject to the kraft condensates standards.[106] Of the 97 kraft pulping mills, we projected at proposal that 15 mills would need to make

[106] See memorandum from J. Bradfield and K. Spence, EPA, to Docket EPA-HQ-OAR-2007-0544, titled *Summary of Kraft Condensate Control Technology Review*, October 23, 2011, in the docket for the subpart S rulemaking.

improvements in condensate collection and/or treatment to raise their control level to 94 percent. The commenter then proceeded to indicate that they believed that EPA was obligated to recalculate the MACT floor and set the new control requirements at 98 percent, the reported levels indicated by the better performing units in the ICR conducted for the rulemaking.

As noted above, EPA disagrees that a section 112(d)(6) technology review obligates the Agency to recalculate MACT floors or otherwise reconsider what the best performing sources can achieve as if this were a repeat of the section 112(d)(2) and (d)(3) analysis. Instead, we read this provision as providing the EPA with substantial latitude in weighing many factors to arrive at the appropriate balance in considering revisions. The central point of our analysis first analyzed performance of condensate treatment units, not cost, as suggested by the commenter.[107] The selection of a 94 percent control level for proposal reflected our consideration of treatment system performance (as we understood it at proposal), as well as our proposal estimates of cost, HAP reductions, energy impacts, secondary air emissions impacts, and small business impacts.

The commenter also indicated that they believe standards should be set based on "emissions achieved" rather than a percentage reduction. We disagree, though we would note that the proposed rule includes a mass per production volume reduction option and a ppm limit for control demonstration, which were both adjusted to reflect equivalence to a 94 percent reduction standard at proposal. Condensates represent the residue of HAP that precipitate out in high-moisture atmosphere gas streams, the non-condensable portion of which is incinerated. The regulations cited by the commenter as examples where, according to the commenter, EPA has maintained that a percent reduction format negates the contribution of HAP inputs to source performance, are all standards affecting combustion sources (*e.g.*, cement kilns, boilers) that can have fuel-related emissions. The mechanisms for reduction of fuel-related combustion emissions are not the same as for HAP emissions from process liquids.

Lastly, the commenter found our choice of cost thresholds arbitrary and capricious, citing our Secondary Lead Smelting NESHAP. While we agree that different thresholds were used in the Secondary Lead Smelting NESHAP, the choices of cost thresholds will vary based on the type of regulatory analysis performed and, with respect to risk assessment, our assessment of risk acceptability. There were two reasons we chose different cost thresholds in this rulemaking. First, in this case, the cost choices in the proposal were made under the section 112(d)(6) technology review, not under a risk-based ample margin of safety analysis. The EPA has ample latitude regarding cost considerations under the section 112(d)(6) technology review. Second, the commenter's analogy draws a comparison to an analysis for a PB-HAP in the Secondary Lead NESHAP RTR, where the risks were judged to be unacceptable. As noted in the proposal preamble, and discussed elsewhere in this document (see section 2.2.4), the pulp and paper subpart S source category was not found to have PB-HAP significant enough to require a multipathway risk assessment, and the risks for the subpart S category evaluated under section 112(f)(2) were found to be acceptable.

68. Comment: Opposition to Increasing Stringency of Kraft Condensates Standard. Several commenters (0162, 0163, 0165, 0167, 0170, 0172, 0207, and 0212) opposed increasing the stringency of the kraft pulping condensate treatment requirements. Commenter 0162 stated that

[107] *Id.*.

EPA had not justified or supplied information in the docket that documented or justified the proposed increase in treatment efficiency to 94 percent. The commenter noted that EPA's documentation states "the average percentage removal of kraft condensates was 96.2 percent," as the sole basis for the proposed increase in treatment requirements.[108] The commenter claimed that EPA did not evaluate the control technologies used for compliance with subpart S and the ability for these systems to perform at higher efficiencies, nor did EPA identify the changes needed to the MACT floor technologies to achieve these higher efficiencies. The commenter stated that EPA had misinterpreted the ICR data and not taken into account system variability, the need for compliance margin, or the higher standard currently required by wastewater treatment systems. Therefore, it was inappropriate for the Agency to propose a higher standard without evaluating the current limits of the control systems in place or documenting how facilities would comply with the proposed standards.

Commenter 0163 agreed with the EPA's assessment that there are no advances that could become the basis for revised treatment options for condensate HAP reductions. The commenter stated that the EPA analyses of the 2011 pulp and paper ICR concluded that all kraft pulp mills are performing at a higher level of control than the 92 percent minimum required and consequently that the technology has advanced since the 1998 MACT rule to warrant the development of an updated standard. The commenter stated that the EPA subsequently developed an "equivalency calculation" that framed a series of higher percent control options and translated these into the optional numerical lb/ODTP and ppm treatment limits as already structured in the current rule. The commenter stated that EPA proposed limits based on their calculation of a 94 percent control efficiency. The commenter concluded (based on their independent review and from the reports provided by NCASI) that EPA had misinterpreted the ICR data and reached an inappropriate conclusion.

According to commenter 0163, the fact that EPA did not uncover any new or advanced control technology was an initial flag regarding EPA's subsequent proposal. A second flag was a significant anomaly resulting from EPA's path forward from what appears to be a flawed analysis that would result in HAP reductions exceeding the condensate HAP collection standards in §63.446(c). The commenter attached NCASI's interim analysis (comment 0163.1 and 0163.2).

Commenter 0165 stated that the technology review is flawed, and there have been no significant technical advances in the past decade. The commenter disagreed with the EPA's requirement of further reductions in the pollutant methanol, stating that methanol is of questionable hazardous impact. The commenter asserted that the pulp and paper industry is already facing significant requirements for Boiler MACT and should not be required to make further expenditures for no improvement.

Commenter 0172 commented that controls at their mills that were installed for MACT were the latest technologies, and that no newer technologies are known that would enable additional methanol removal and treatment from process condensates. The commenter strongly endorsed the comments of NCASI that EPA inappropriately used data from industry responses to the Part I ICR when deciding to raise the required destruction efficiency for steam strippers from 92 percent to 94 percent. The Agency did not adequately analyze data from facilities using the

[108] *Id.*

CCA, or those having high-rate biological treatment systems, and did not consider operational and seasonal variability, or degradation in the performance of steam strippers over time. After properly discarding these outlier facilities from the database, the remaining data set represents a very limited number of mills and thus fails to provide a sufficient basis for revising the condensate treatment standard.

Commenter 0172 also stated that EPA failed to use the correct calculation methodology to derive the proposed new lb/ton limits in several ways. First, EPA inappropriately extended the 25 percent increase in percent destruction efficiency to the mass destruction standards. Second, EPA did not fully evaluate the regulatory or economic impacts of modifying the mass destruction requirements. The EPA appeared to have simply evaluated the mass destruction values calculated during the initial performance tests and reported in the ICR submittals and then concluded that most facilities would be able to comply with this "average" value. The Agency did not consider that normal process variability causes facilities to be either over or under this destruction value on a daily basis. This was a critical oversight, as compliance with the standard must be demonstrated on a daily basis. Unless this normal process variability is considered, some mills will be out of compliance a statistically significant portion of the time.

Response: We have reviewed the ICR data identified as a "misinterpretation" and made the appropriate adjustments to our evaluation in the final rule. The commenter appears to misunderstand some of the components of our analysis. They indicate a belief that the lack of new control technology application is significant in our analysis. It is not. As noted elsewhere in this section, our analysis focused on the "practice" of existing technology, put in place with the MACT rule and evaluated whether there were advances in the application of that control technology. Specifically, in this instance, our conclusion that there was a "development" in the application of the control technology was based on the information assembled at proposal showing many mills achieving emissions reductions well above the standard. Additionally, the commenter noted that they believe methanol's hazardous impact is questionable. Regarding risk, our decision related to the hazard of methanol (and other HAPs) was considered under our two-step assessment process and found acceptable. However, our control decisions for kraft condensates were made within the context of a section 112(d)(6) technology review. Methanol is a HAP, HAP control was the basis of the MACT floor, and using methanol as the basis for this analysis is appropriate.

Nevertheless, EPA has reanalyzed the condensate treatment technology performance levels in light of information provided by the commenter. We reviewed the additional cost and control information provided by the commenter, information that supplements data collected in the ICR. We reanalyzed the condensate treatment technology performance. The condensate treatment technology performance levels, costs, and impacts used in our analysis for the final rule are included in the docket and summarized elsewhere in this document (*e.g.*, in this section and in section 9).[109] Our reanalysis of the kraft condensate standards and impacts considered (among other things) the following:

[109] See memorandum from T. Holloway, K. Hanks, and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA, titled *Costs, Environmental, and Energy Impacts for the Promulgated Subpart S Risk and Technology Review*, May 15, 2012, in the docket for the subpart S rulemaking.

- Regulatory options for 93 and 94 percent HAP removal (as compared to the baseline of 92 percent);
- No change in the condensate collection requirements, and clarified through revised lb/ODTP and ppmw treatment limits;
- Variability in treatment system performance;
- Potential impacts of condensate HAP concentrations on CCA mills using approaches involving process water; and
- Energy and secondary air emissions impacts for new and upgraded steam strippers.

The EPA has decided not to promulgate revisions to the kraft condensate standards upon further evaluation of the costs, energy, and secondary air emissions impacts associated with upgrading condensate treatment systems.

69. Comment: Technology Unchanged for Condensate Treatment. Commenter 0162 agreed with EPA's determination that its "technology review of kraft condensates did not yield any information about new technologies that could become the basis for regulatory options" (76 FR 81345). According to commenters 0162 and 0172, the technology used by the industry for subpart S compliance is the same as when the rule was promulgated. Commenter 0162 stated that these systems have the same capabilities as the units that were used by the "best performing" mills that were the basis for the MACT "floor."

However, commenters 0162 and 1072 disagreed with EPA's proposal preamble statement that, "[f]or kraft pulping condensates, we have determined that the technology has sufficiently advanced since the 1998 MACT rule to warrant the development of an updated standard" (See 76 FR 81344). Commenter 0162 stated that CAA section 112(d)(6) directs EPA to "review, and revise as necessary…[the initial MACT standards] (taking into account developments in practices, processes, and control technologies)" (emphasis added). The EPA has now proposed to revise the condensate treatment requirements, not because the Agency has identified any new developments in processes or treatment technologies beyond what EPA identified when establishing the MACT floor, but simply because EPA believed it had data indicating that wastewater treatment systems and steam strippers achieve control efficiencies greater than the 92 percent that the current MACT rules require. First, there is no support of the Agency's conclusion in the available data.[110] Additionally, even if this were true, this is not a sufficient finding to warrant revising the MACT standards pursuant to section 112(d)(6) (and EPA lacks any other authority for revising the subpart S MACT standards[111]).

[110] Interim comments on rationale and methodologies used to evaluate and propose increased treatment requirements for kraft condensates in the Pulp and Paper ICR, NCASI Memo to Ms. Robin Dunkins, Mr. John Bradfield, Mr. Bill Schrock, February 17, 2012. – This memo outlines other factors to be considered while reviewing condensate treatment data reported in the ICR and why it is inappropriate to attribute the performance to technological or operational improvements. – The contents of the NCASI memorandum are discussed and provided as Attachment 4 to comment 0162.

[111] Congress structured section 112 unlike other provisions of the CAA (and other environmental statutes). Under CAA sections 112(c)(2) and 112(e), EPA was given definite deadlines for promulgating MACT standards for various source categories. The MACT "floor" thus represented performance at a specified point in time. Congress did not give EPA authority to review periodically the performance achieved by the "best performing" facilities, but only to determine, at least every eight years after the MACT "floor" was established (and any more-stringent

Commenter 0162 contended that analysis of stripper performance test data in the docket was inadequate and that EPA lacked an understanding of what the data represent. The test data were not summarized to the extent that they could be verified by the companies that submitted such data within EPA's massive ICR effort. Individual test data were not even listed in the docket. The commenter asserted that the data were largely initial compliance test data as required by the rule. These tests confirm compliance with the rule with a necessary margin to assure compliance over the range of operating conditions the stripper will see. The same is true of analogous wastewater treatment system controls. A margin of compliance determined under initial performance test conditions verifies proper design and construction of the equipment and not that "technologies have advanced." Further, the commenter could find no adequate description in the record on how EPA was considering to modify stripper and wastewater treatment systems to achieve a higher 94 percent destruction efficiency, while maintaining a margin and certainty of compliance needed for operation over the range of conditions present. Finally, the calculated lb/ton compliance option requirements, purportedly consistent with the 94 percent efficiency objective, could not be achieved, in any way the commenter could determine, without more than doubling the investment in control equipment. The commenter concluded that the logic employed in developing the lb/ton proposed requirements was clearly flawed.

Commenter 0162 stated that when the statute directs EPA to revise MACT standards only where "necessary…taking into account developments" in process and control technology, EPA must identify specific changes in the applicable technology that necessitate a change in the standard, and that EPA has not done so here. The commenter stated that neither the preamble to the proposed rule nor any document they could identify in the docket described new control technology for pulp mill condensates, nor even advances in the condensate collection and steam stripper technology that was the basis for existing condensate treatment standards. Rather, EPA had concluded that it could set a more-stringent limit that could be met by some mills using the same technology that was the basis of the existing MACT standards. The commenter asserted that Congress clearly did not intend for section 112(d)(6) to authorize that sort of tightening of the standard that companies have already taken the steps to meet, absent a specific change in available technology. (Moreover, as EPA has already acknowledged, even if new, more effective treatment technology were available, EPA would still need to consider the cost effectiveness of that technology and other factors (See *NRDC v. EPA*, 529 F.3d 1077, 1084 (D.C. Cir. 2008)). The commenter contended that EPA had not conducted that sort of analysis here.

Commenter 0162 stated that the only fact EPA relied on to propose revised standards, purportedly under authority of CAA section 112(d)(6), was that some mills are achieving HAP removal rates greater than the 92 percent MACT removal rate. The commenter noted that it would be surprising if mills were meeting the MACT standards at all times and with a very high compliance probability and yet on average had treatment efficiencies no higher than the minimal efficiency necessary to comply with the existing MACT standards. For instance, sound engineering and environmental control practices would require a steam stripper to be designed and operated with removal efficiency greater than 92 percent to assure compliance at all times. The commenter asserted that nothing in the language of section 112(d)(6), the legislative history of section 112, or common sense suggests that Congress wanted EPA to constantly "ratchet-

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"beyond-the-floor" MACT standards were justified), whether it is necessary to revise the MACT standards to account for "developments in practices, processes, and control technologies."

down" the MACT standards, removing the margin of compliance that facilities have built into their HAP control systems. The commenter stated that adjustments are appropriate only when there are advances in practices, processes, or control technologies.

Response: We disagree with the commenter's interpretation of our legal authority concerning setting tighter standards for kraft condensates under CAA section 112(d)(6). As noted above, we interpret section 112(d)(6) as essentially requiring us to consider all developments in practices, processes, and control technologies in the industry. When we take into account the "developments in practices, processes, and control technologies," we interpret that language as a requirement not only to evaluate new control technologies and process improvements but also to evaluate the application of existing control technologies that were the basis of the MACT floor. In that evaluation we examine whether, in the 'practice' of applying the MACT floor technology, there have been technological advances. Generally, we consider whether the MACT floor technology, in practice, is performing better than anticipated in the original MACT floor analysis. Indeed, we did not find in our evaluation of data received in the ICR conducted prior to proposal that there were significant modifications to the basic kraft pulping process or new technologies for control of condensates. In the proposal, our initial evaluation indicated that kraft condensate control, using the technologies originally anticipated had improved since promulgation. Consequently, we proposed to raise the treatment standard from a 92 percent control basis to a 94 percent basis.[112] However, as discussed previously, we have since reevaluated the data in light of information provided by the commenter.

Discussions with industry representatives ensued shortly after the proposal was published in the *Federal Register* on December 27, 2011, when industry representatives began expressing their concerns with the proposal. The EPA met with industry representatives to discuss the kraft condensate standards on January 12, March 16, March 28 and May 2, 2012. Minutes for these meetings were placed in the docket soon after each meeting occurred.[113] In response to the commenters' request for additional information on EPA's analysis, EPA provided a spreadsheet on January 12, 2012 showing the data that EPA used in developing the proposed revisions to the condensate limits.[114] We reanalyzed the condensate treatment technology performance levels in light of information provided by the commenter, which supplements the ICR. The condensate treatment technology performance levels used in our analysis for the final rule are also included in the docket.[115] Our reanalysis of the kraft condensate standards considered the following:

- Regulatory options for 93 and 94 percent HAP removal (as compared to the baseline of 92 percent);
- No change in the condensate collection requirements, and clarified through revised lb/ODTP and ppmw treatment limits;

[112] See memorandum from J. Bradfield and K. Spence, EPA, to Docket EPA-HQ-OAR-2007-0544, titled *Summary of Kraft Condensate Control Technology Review*, October 23, 2011, in the docket for the subpart S rulemaking.
[113] See U.S. EPA documents titled, *Meeting notes for the January 12, 2012 meeting with AF&PA*; *Meeting notes for the March 16, 2012 meeting with AF&PA*; *Meeting notes for the March 28, 2012 meeting with AF&PA*; and *Meeting notes for the May 2, 2012 meeting with AF&PA*, in the docket for the subpart S rulemaking.
[114] See U.S. EPA document, titled *Materials for January 12, 2012 Meeting with Pulp and Paper Industry Representatives to Discuss the December 27, 2011 Pulp and Paper RTR Proposal; Part I.*
[115] See memorandum from T. Holloway, K. Hanks, and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA, titled *Costs, Environmental, and Energy Impacts for the Promulgated Subpart S Risk and Technology Review*. May 15, 2012, in the docket for the subpart S rulemaking.

- Variability in treatment system performance; and
- Potential impacts on CCA mills using approaches involving process water of condensate HAP concentrations

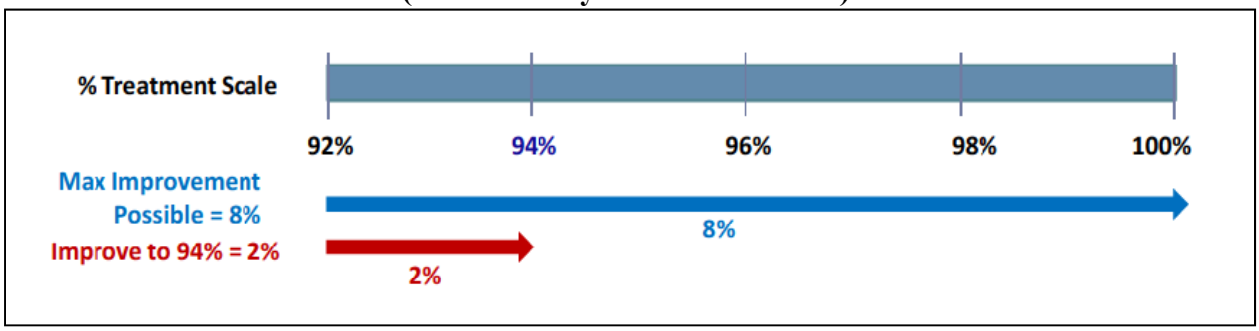
We did not propose, and nor are we adopting, additional collection requirements. The EPA has decided not to promulgate revisions to the kraft condensate standards upon further evaluation of the costs, energy, and secondary air emissions impacts associated with upgrading these systems.

Regarding the commenter's concern that data supporting the proposal analysis were not available in the docket, we note that our analysis of the kraft condensate standards at proposal was documented in a memorandum, "*Summary of Kraft Condensate Control Technology Review*" (EPA-HQ-OAR-2007-0544-0128), which was available in the docket when the proposed rule was published in the *Federal Register*.

70. Comment: Clarification of the Proposed Numerical Limits. Commenters 0162 and 0167 stated that the numerical HAP treatment levels EPA proposed are greater than the current HAP collection requirements. The commenters stated that the proposal to increase the required HAP reduction (*e.g.*, from 10.2 lb/ODTP in the current rule to 12.8 lb/ODTP, for bleached kraft mills and from 6.6 lb/ODTP in the current rule to 8.3 lb/ODTP, for unbleached kraft mills) is not consistent with the proposed rule's stated basis: that the removal efficiency can be increased from the 92 percent to 94 percent and that no additional condensates need to be collected.

Commenter 0162 noted that in the equivalency calculation used to arrive at these numerical limits, EPA calculated the percent increase in control for each 1 percent increase in treatment efficiency from 92 percent to 98 percent (the level of control achieved for mills choosing the condensate recycling option). The commenter represented EPA's rationale graphically in Figure 1 below:

Figure 1. EPA Calculation Methodology
(Submitted by Commenter 0162)



Using this approach, the percent "standard improvement"[116] corresponding to an increase in treatment efficiency from 92 percent to 94 percent would be 2 percent of the maximum possible 8 percent = 2/8 = 25 percent. Using this approach, the percent "standard improvement" for each 1 percent increase in treatment efficiency (from 93 percent to 98 percent) would be:

[116] See memorandum from J. Bradfield and K. Spence, EPA, to Docket EPA-HQ-OAR-2007-0544, titled *Summary of Kraft Condensate Control Technology Review*, page 4, October 23, 2011, in the docket for the subpart S rulemaking.

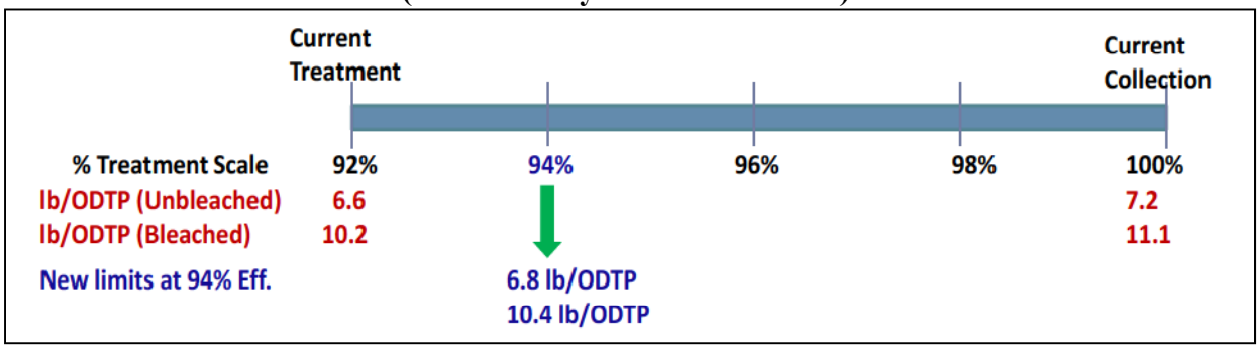
- At 93% - 1 percent of max possible 8% = 1/8 = 12.5%
- At 94% - 2 percent of max possible 8% = 2/8 = 25%
- At 95% - 3/8 = 37.5%
- And so forth

These percent "standard improvements" were subsequently directly applied as scaling factors to arrive at numerical treatment limits in Table 2 in the October 23, 2011 memo.

As discussed during the meeting between EPA and AF&PA on Jan 12, 2012, the commenter contended that the above methodology of calculating numerical limits is inconsistent with the premise behind the equivalency approach. The commenter provided the following insights from the equivalency approach highlight this issue:

- The scale ranging from 92 percent to 100 percent is the treatment scale.
- Assuming that whatever is not treated/controlled is released as emissions, emissions would reduce from 8 percent to 0 percent as treatment increases from 92 to 100 percent.
- The percent "standard improvements" calculated above are, in effect, emissions reductions.
- In other words, a 2 percent increase in the numerical treatment efficiency standard is equivalent to a 25 percent reduction in associated remaining emissions.
- When calculating numerical treatment limits, the applicable scaling factors should therefore reflect the original treatment scale and not the percent "standard improvement" (emissions) scale. As done in the original rulemaking, the lb/ODTP treatment requirement is simply calculated by multiplying the collection requirement by the proposed percent control efficiency, as shown in Figure 2 below.

Figure 2. AF&PA Recommended Calculation Methodology (Submitted by Commenter 0162)



Commenters 0162 and 0167 stated that the numerical treatment standards corresponding to the 94 percent treatment level can be calculated directly as shown below and are represented on the treatment scale in Figure 2 above.

- 7.2 lb/ODTP x 0.94 = 6.8 lb/ODTP for unbleached mills
- 11.1 lb/ODTP x 0.94 = 10.4 lb/ODTP for unbleached mills

Commenter 0162 provided an alternate approach to calculating these numerical treatment levels that is logically consistent with applying EPA's statements about increasing treatment efficiency from 92 to 94 percent using the percent "standard improvement" scale as follows:

- Collection levels are 7.2 lb/ODTP and 11.1 lb/ODTP (unbleached and bleached respectively).
- At 92 percent, the treatment levels are 6.6 lb/ODTP and 10.2 lb/ODTP.
- Therefore, when increasing the treatment standard from 92 percent to 94 percent, you achieve a 25 percent "standard improvement" (reduction in emissions).
- 6.6 + 25% of (7.2 – 6.6) = 6.8 lb/ODTP – unbleached mills
- 10.2 + 25% of (11.1 – 10.2) = 10.4 lb/ODTP – bleached mills

In developing the ppmw option that equates to 94 percent removal, commenter 0162 stated that EPA used the correct calculation methodology. For example, the current standard for bleached mills is 330 ppmw at the outlet of the control device. Since this standard was based on a treatment efficiency of 92 percent, it would be assumed that the inlet condensate concentration is 4125 ppmw (330 / (1-0.92)). If the treatment standard were raised to a level of 94 percent, the outlet concentration would need to be lower than 248 ppmw[117] (4125 ppmw x (1-0.94)).

Commenter 0162 noted that EPA calculated that the rule would result in the reduction of 4,000 tons of HAP emissions per year. Based on the assumption that 97 mills produce an average 1,000 ODTP per day (d) and the average decrease in emissions would be 0.2 lb/ODTP (equivalent increase in the standard calculated using the AF&PA methodology), the result is a reduction of approximately 3,500 ton HAP per year (yr), which is in line with the EPA estimate.

In addition, commenter 0172 also stated that EPA's currently proposed lb/ton limits are actually above the amount of condensate that mills are required to collect in the first place (11.1 lb/ton for bleached mills and 7.2 lb/ton for unbleached mills). The mass collection requirements were originally developed after evaluating available HAPs in each condensate stream, which streams could be economically treated, and variability of those streams. The EPA did not propose to raise these collection requirements. Thus, the Agency cannot legally or logically promulgate a destruction standard that is higher than the present collection requirement. Should EPA promulgate the proposed lb/ton limits along with the new destruction standard notwithstanding these comments, the effect would be to require bleached mills to collect 13.6 lb/ton (12.8 ÷ 0.94) and unbleached mills to collect 8.8 lb/ton (8.3 ÷ 0.94). These collection amounts are far above the 11.1 lb/ton and 7.2 lb/ton MACT floors that were established in the original Cluster Rule. The commenter contended that EPA does not provide any justification to modify these MACT floor limits and thus cannot promulgate these flawed numbers. The commenter stated there have been no "developments in practices, processes and control technologies" as required by section 112(d)(6) in kraft pulping in the last 10 years that would justify a change in the condensate collection MACT floor. Commenter 0172 stated that these numbers, in many mills, are above the amount of regulated condensates that are routinely available to collect from their regulated processes. Several of the commenter's mills would be

[117] See memorandum from J. Bradfield and K. Spence, EPA, to Docket EPA-HQ-OAR-2007-0544, titled *Summary of Kraft Condensate Control Technology Review*, page 4, October 23, 2011, in the docket for the subpart S rulemaking.

unable to meet either the collection or destruction standards simply because the process is not able to generate enough methanol or the mill's condensate treatment system (stripper) is not capable of treating more condensate. Specific data from the commenter's kraft mills provided in Table 6 below demonstrate that several mills would face significant periods of non-compliance with the collection standard should EPA raise the destruction standard.

Table 6. Data on Methanol Collection and Percent of Time below De Facto Proposed Collection Standard from Georgia-Pacific Kraft Mills (Submitted by Commenter 0172)

Mill	Average Methanol Collection, lb/ton	Percent of Time Below De Facto Proposed Collection Standard	Comments
Cedar Springs, GA	10.6	13%	Mill's stripper at maximum capacity, no opportunity for treating additional condensates
Palatka, FL	13.2	23%	Very limited opportunity for additional collection
Crossett, AR	14.2	32%	Collecting all named streams, no opportunity for collecting additional condensates
Monticello, MS	8.6	49%	Very limited opportunity for additional collection
Port Hudson, LA	13.3	61%	Collecting all named streams, no opportunity for collecting additional condensates
Brunswick, GA	11.8	95%	Mill's stripper
Camas, WA	13.2	92%	Collecting all named streams, no opportunity for collecting additional condensates

Similarly, commenter 0207 stated that significantly more stringent standards could create compliance issues for the commenter's mills if the species or condition of the wood pulped at the mills were to change. The commenter contended that EPA's proposal had not accounted for such long-term variability and uncertainty in mills' collection efficiencies. The commenter noted that, by design, their condensate collection systems generally achieve "over-collection" of HAPs in order to maintain compliance under varying operating conditions. The commenter argued that EPA's proposal to raise the bar of compliance simply because some facilities have built a margin of compliance was not justified.

Response: It was not our intent to propose an increase the condensate collection requirements. Rather, we intended to reflect advances in condensate treatment efficiency with our revisions to the condensate standards. We updated our equivalency calculation for the treatment limits as part of our reanalysis of the condensate performance levels. Table 7 below lists the percent removal treatment regulatory options and their equivalents in lb/ODTP and ppmw considered for the final rule. The treatment standards considered for the final rule did not exceed the collection requirements. As noted elsewhere, EPA has decided not to promulgate revisions to the kraft condensate standards.

Table 7. Kraft Condensate Treatment Standards Considered for the Final Rule

Percent removal option	lb/ODTP removal[a]		ppmw[b]	
	Unbleached	Bleached	Unbleached	Bleached
92% (baseline)	6.6	10.2	210	330
93%	6.7	10.3	184	289
94%	6.8	10.4	158	248

a. The equivalent lb/ODTP removal standards were calculated as follows: 0.93 x 7.2 = 6.7; 0.93 x 11.1 = 10.3; 0.94 x 7.2 = 6.8; 0.94 x 11.1 = 10.4.
b. The equivalent ppmw standards were developed by first back-calculating an uncontrolled ppmw, U [210 ppmw = (1-0.92)U → U=2625 ppmw], and then applying the revised percent reduction to U [(1-0.93) 2625 = 184 ppmw].

71. Comment: ICR Data Inappropriately Interpreted. Commenters 0162 and 0163.2 included NCASI's interim comment. They stated that EPA staff suggested informally, during a meeting with industry representatives on January 12, 2012, that the mass HAP reduction standard proposed in the rulemaking could also be justified by ICR data. The commenters asserted that this was inconsistent with rule language in the proposal, which suggested that the proposed numerical limits were based on a supposed equivalency between a 94 percent removal rate and a lb/ODTP mass reduction (see 76 FR 81345). The commenters stated that they did not have anything in writing from EPA explaining the basis for the proposed mass removal rate requirements, which prevented the industry from commenting effectively on the December 27, 2011 proposed rule. Nevertheless, the commenters noted that EPA had suggested in subsequent discussions that information reported by mills in response to the Part I ICR supported the proposed rule. NCASI had attempted to analyze the ICR data to help EPA understand its significance. The commenter noted that during the January 12 meeting with industry representatives, EPA also provided a spreadsheet summarizing the data EPA had culled from industry responses to the Part I ICR.

Since that meeting, NCASI was able to access the entire set of responses EPA received to the Part I ICR. In response to EPA's proposal to increase assumed stripper (or biotreatment) efficiency from 92 to 94 percent, NCASI has determined that the ICR data are not sufficient to support that proposal (or any increase in treatment efficiency above the current MACT standards). With respect to lb/ODTP condensate treatment levels, NCASI has analyzed the ICR responses to assess whether they could be used to support a conclusion that technology improvements would allow for more stringent condensate treatment requirements.

In its review, EPA subcategorized kraft mills based on the type of treatment performance data provided in the ICR. Specifically, EPA reviewed the mass treatment levels (lb/ODTP) reported by both unbleached and bleached mills to ascertain whether operational improvements had been realized by facilities. As discussed in the meeting with AF&PA and NCASI on January 12, 2012, several other factors need to be considered while reviewing condensate treatment performance data reported in the ICR and attributing that data to technological or operational improvements. These other factors are provided below:

- Facilities using the CCA - For facilities complying with the HVLC system requirements under §63.443 using CCA (§63.447) or other "equivalency by permit" options, the reported condensate treatment levels reflect compliance with the requirements under both §§63.446 and 63.447 (Phase 1 and Phase 2, respectively). Therefore, as indicated by EPA in the meeting, it is inappropriate to attribute the combined treatment values to Phase 1 treatment requirements. (An example CCA compliance option was discussed in Attachment 6 to comment 0162.)

- High performance biological treatment systems – A handful of facilities demonstrate compliance with Phase 1 by treating hardpiped condensates in high-rate biotreatment systems like activated sludge treatment (AST), anaerobic treatment, or UNOX. These

dedicated high rate systems can operate at higher treatment efficiencies than traditional ASBs. As a consequence, these systems are generally paired with lower lb/ODTP collection levels (closer to the 11.1 lb/ODTP collection requirement for bleached mills). The focus in these systems is to collect higher-concentration (lower-volume) condensates and to minimize flow (which is a significant determinant in system capital and operating costs). The trade-off is higher treatment efficiency on a smaller (more-concentrated and lower-volume) amount of HAP for roughly equivalent lb/ton-treated performance.

When percent treatment data from these systems are combined with those of ASBs and the "combined average" is compared against the current 92 percent standard, there is a potential to erroneously conclude that ASBs are performing at levels above the current standard.

- Operational and seasonal variability in biological treatment system performance – Facilities have the option of collecting additional condensates in their hardpiping system in order to maintain compliance flexibility, *i.e.*, to be able to demonstrate compliance using either the "percent removal" or "lb/ODTP" treatment options. Additionally, reported treatment levels also reflect safety margins required to demonstrate ongoing compliance with treatment requirements over the wide range of operational situations that exist throughout typical pulp mills.

- Facilities demonstrating compliance using steam strippers – The reported percent destruction OR percent removal numbers reflect equipment performance during one or two initial performance tests (IPTs). These datasets are snapshots of performance immediately following commissioning or scheduled maintenance and reflect safety factors inherent in equipment design. These design factors are essential to ensure ongoing compliance at the level of the current standard. They compensate for the gradual degradation of performance from the higher initial level of control to the minimum control requirement over normal maintenance cycles, largely attributable to fouling or scaling of heat transfer surfaces in contact with process condensates. Initial performance tests would, by nature, capture the high end of designed performance.

From the data requested in the ICR, it would not be possible for EPA to discern the relative importance and contributions of these factors, particularly in the context of the wide flexibility in compliance options, the design variations, and operational differences that exist among individual compliance systems. Recognizing this, companies responding to the ICR had requested that EPA confer with them in analyzing the data in order to ensure that conclusions reflected a thorough understanding of process variations and realities. The EPA chose not to communicate on these issues in developing the proposed standards.

The ICR data provided by EPA was analyzed by NCASI in order to further illustrate the points reiterated above. NCASI drew the following conclusions from their analysis:[118]

- Mills reporting percent removal in biotreatment systems

[118] These conclusions (and the ones for unbleached mills and steam strippers below) address performance data as it pertains to condensate treatment. More detailed comments on the inherent variability in condensate collection levels, and compliance strategies used to accommodate the same, are provided in Section IV.C3 of comment 0162.

- Only 4 mills have reported percent removals in biotreatment systems that (a) are representative of Phase 1 compliance and (b) can be compared against the current requirement of 92 percent. This is too limited a list from which to draw substantive conclusions on over-performance.
- Additionally, the percent removal data do not indicate control levels in excess of current requirements (when compared against the actual $F_{bio, methanol}$ of 94 percent).[119]
- Information from such a limited list of mills is not an adequate basis for revising the current percent removal standards.

- Unbleached mills reporting mass treatment levels (lb/ODTP)
  - Only 3 facilities remain on the list with reported lb/ODTP treatment levels reflective of Phase 1 compliance. Data from such a limited number of facilities is not an adequate basis for revising the numerical condensate treatment standards.

- Bleached mills reporting mass treatment levels (lb/ODTP)
  - For facilities employing steam strippers, reported treatment levels reflect equipment performance during one or two IPTs. These datasets reflect performance immediately following commissioning or scheduled maintenance and reflect safety factors inherent in equipment design. These factors are incorporated during equipment design and are essential to ensure ongoing compliance at the level of the current standard (*i.e.*, 92 percent).
  - Given the limited number of mills remaining on this list, it is inappropriate to use treatment information available from these mills as the basis to revise the condensate treatment standards.

The details of this analysis are included in Attachment 4 to comment 0162.

Response: Our analysis of the kraft condensate standards at proposal was documented in a memorandum, "*Summary of Kraft Condensate Control Technology Review*" (EPA-HQ-OAR-2007-0544-0128), which was available in the docket when the proposed rule was published in the *Federal Register*. The EPA did not discuss consideration of revisions to the kraft condensate standards with industry representatives prior to proposal, in part because we thought that only a marginal change in treatment efficiency was being proposed, and also because of time limitations for development of the proposal.[120] Discussions with industry representatives ensued shortly after the proposal was published in the *Federal Register* on December 27, 2011 when industry representatives began expressing their concerns with the proposal. The EPA met with industry representatives to discuss the kraft condensate standards on January 12, March 16, March 28 and May 2, 2012. Minutes for these meetings were placed in the docket soon after each meeting

[119] The need to demonstrate "treatment equivalency" for non-methanol HAPs means that in order to demonstrate an *effective* methanol treatment efficiency of 92 percent ($F_{bio, adjusted}$), the *actual* methanol treatment efficiency ($F_{bio, methanol}$) would have to be at 94 percent. Details provided in Attachment 4 to comment 0162.

[120] To address a lawsuit filed by Sierra Club, the subpart S RTR package was scheduled to be signed by the Administrator for proposal by December 15, 2011.

occurred.[121] In response to the commenters' request for additional information on EPA's analysis, EPA provided a spreadsheet showing the data EPA used in developing the proposed revisions to the condensate limits on January 12, 2012. The condensate treatment technology performance levels used in our analysis for the final rule are also included in the docket.[122] Our reanalysis of the kraft condensate standards considered the following:

- Regulatory options for 93 and 94 percent HAP removal (as compared to the baseline of 92 percent);
- No change in the condensate collection requirements, and clarified through revised lb/ODTP and ppmw treatment limits;
- Variability in treatment system performance; and
- Potential impacts on 34 of 38 CCA mills using CCA approaches involving process water of condensate HAP concentrations.

We acknowledge the commenters' summary of Phase 1 and Phase 2 treatment levels, and note that this is an issue for mills using the CCA. We took another look at the survey data for CCA mills (independent of the comments received) and included costs and impact estimates for mills where we understood the CCA approach could potentially be negated by the revised condensate standards. We also considered costs to repeat the CCA demonstration in the impacts analysis for the final rule.

We reviewed the performance data from the Part I ICR for biotreatment systems by coupling the data reported in the ICR *Kraft Condensates* table with data reported in the ICR *Wastewater* table in order to evaluate which mills might be affected by the different condensate regulatory options under consideration. In the *Wastewater* table, mills provided quarterly results for the fraction of methanol removed ($F_{bio,\ methanol}$), total HAP percent removal, and total HAP mass removal in kilograms per megagram of oven-dried pulp (kg/Mg ODP). Compliance is based on the total HAP percent removal or total HAP mass removal, which we converted to lb/ODTP for comparison with the regulatory options. Although commenters suggested that AST and UNOX systems typically have higher treatment efficiencies than ASBs, we noted overlap in the $F_{bio,\ methanol}$ values reported in the ICR *Wastewater* table for all three system types, likely due to normal variability in biotreatment system performance.[123] We also note that the cost to upgrade an ASB to AST is in the $30 to 35 million range for a single system,[124] and UNOX systems would be "replacement" biotreatment systems (*i.e.*, upgrade from an ASB is not feasible). Therefore, a change in biotreatment system type was not found to be cost-effective (or feasible) for the incremental change in the kraft condensate standards. Rather, we expect that mills would install a steam stripper for condensate control if their existing biotreatment system could not consistently achieve the regulatory options due to variability.

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[121] See U.S. EPA documents, titled *Meeting notes for the January 12, 2012 meeting with AF&PA*; *Meeting notes for the March 16, 2012 meeting with AF&PA*; *Meeting notes for the March 28, 2012 meeting with AF&PA*; and *Meeting notes for the May 2, 2012 meeting with AF&PA*, in the docket for the subpart S rulemaking.

[122] See memorandum from T. Holloway, K. Hanks, and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA, titled *Costs, Environmental, and Energy Impacts for the Promulgated Subpart S Risk and Technology Review*, May 15, 2012, in the docket for the subpart S rulemaking.

[123] *Id*, Appendix A3.

[124] See U.S. EPA document, titled *Meeting notes for the May 2, 2012 meeting with AF&PA*, in the docket for the subpart S rulemaking

Regarding steam stripper variability, we acknowledge that some of the data reported in the ICR and used to asses steam stripper performance was IPT data. However, many ICR respondents provided more recent repeat performance test data. We considered all of the reported performance levels in our reanalysis.

When considering all treatment systems (biotreatment and steam strippers), we noted from our reanalysis of performance data that mills are, on average, operating with a margin for variability of about 4 percent removal, or 50 percent on a lb/ODTP basis. As noted extensively by commenters, the reasons for operational variability vary from mill to mill, and include the need for condensate over-collection and/or over-treatment to ensure compliance with the lb/ODTP treatment standard or CCA; or over-treatment to ensure compliance with the percent reduction or ppmw standard. Operational variability was factored into our reanalysis of the costs and impacts of the revised condensate treatment standards. After accounting for variability and other comments related to the impacts analysis (*e.g.*, the need to account for steam stripper energy impacts), we found that the 93 and 94 percent removal condensate treatment options under consideration for the final rule were not cost-effective and resulted in undesirable energy and secondary air emissions impacts. Therefore, we have decided not to promulgate revisions to the kraft condensate standards.

72. Comment: Variability in Condensate Collection. Commenters 0162 and 0163.1 stated that the amount of methanol generated and subsequently collected in condensate streams varies significantly between mills. This variability is driven by process type and final product quality (batch vs. continuous pulping, unbleached vs. bleached, bleaching sequences, and oxygen delignification). Studies have also shown that, for any given mill, there is significant day-to-day variability in methanol content of condensate streams. Consequently, mills need a reasonable averaging time to demonstrate compliance with the collection requirements. Facilities have used site-specific data on variability and, in many cases, a statistical calculation methodology, to demonstrate the need for this averaging period. The majority of the facilities use either a 15-day or 30-day averaging period to demonstrate compliance with these requirements.

The commenters noted that a statistical approach was outlined by NCASI, during the original rulemaking, to calculate the averaging periods required to demonstrate compliance. The methodology and factors affecting this calculation are detailed in Attachment 7 to comment 0162 (and in Attachment A to comment 0163.1). The Relative Standard Deviation (RSD) for methanol collection is calculated from mill-specific data. The averaging period needed to demonstrate compliance is calculated for the following scenario:

- Mill over-collecting condensates by 10 percent, and
- Mill demonstrating compliance with a 95 percent compliance probability.

This approach can also be extended to other compliance probabilities and over-collection levels. In order to address the issue from the perspective of over-collection and to illustrate its importance in demonstrating compliance, Table 8 below extends this analysis to include the following:

- Facility uses a 15-day averaging period to demonstrate compliance.
- For a given RSD, the levels of over-collection required to demonstrate compliance at different compliance probabilities are calculated.

- This exercise is repeated for varying RSD levels.

Table 8 below provides the over-collection levels to demonstrate compliance with lb/ODTP collection requirements (Basis: 15-day averaging period)–submitted by commenters 0162 (Table 4) and 0163.1 (Table 1).

Table 8. Over-Collection Levels to Demonstrate Compliance with lb/ODTP Collection Requirements
(Submitted by Commenters 0162 and 0163.1)

	Percent Compliance Probability				
RSD	**95%**	**96%**	**97%**	**98%**	**99%**
20	9	10	11	12	14
25	12	13	14	15	18
30	15	16	17	19	22
35	17	19	20	23	27

As an example, a facility with an RSD of 30, in site-specific condensate methanol content, would have to do the following:

- Over-collect methanol by 22 percent to demonstrate compliance with a 99 percent compliance probability.
- In other words, a bleached mill would have to collect 13.5 lb/ODTP and an unbleached mill would have to collect 8.8 lb/ODTP in order to demonstrate compliance with reasonable assurance 99 percent of the time.
- In order to demonstrate compliance with a 99 percent probability, even with a 15-day averaging period, a facility needs anywhere from 14 to 27 percent of methanol over-collection, depending on the RSD of collection data.

Table 9 below provides a snapshot of daily variability in methanol content in condensates at four mills, again illustrating the need for over-collection to demonstrate compliance with high percent compliance probabilities, at the level required by the current standard.

Table 9. Condensate Collection Characteristics at Four Kraft Mills
(Submitted by Commenters 0162 and 0163.1)

	Condensate Collection Characteristics		
Source	**Avg. Daily Collection, lb/ODTP**	**Standard Deviation (SD)**	**RSD**
Mill A (Bleached)	12.7	3.2	25.1
Mill B (Unbleached)	9.5	3.1	32.5
Mill C (Bleached)	15.1	3.4	22.4
Mill D (Bleached)	17.7	4.4	25.0

Given (a) the above discussed variability in methanol collection and (b) the requirement to demonstrate compliance at all times, the above analysis illustrates the following:

- Over-collection is an essential part of the compliance strategy used by mills.
- Over-collection levels and averaging times serve to increase compliance certainty with the condensate collection requirements.

- Therefore, numerical average data on collection levels that exceed currently promulgated levels (11.1 lb/ODTP and 7.2 lb/ODTP for bleached and unbleached mills, respectively) should not be interpreted as performance at levels exceeding the current standard.

Response: The EPA has evaluated the comment data provided on variability, as well as the rule's current approach to averaging times for condensate collection. We have also reanalyzed the impact of process and treatment system variability in our regulatory analyses for the final rule. When accounting for variability, we have determined that a greater number of mills would be impacted by the proposed kraft condensate revisions than was estimated at proposal. We have also estimated that several of these mills would require installation of a new steam stripper to achieve the increase in treatment efficiency proposed. New steam strippers would require significant additional energy to operate (*i.e.*, steam produced from an onsite boiler), and, therefore, have energy and secondary air emission impacts not considered at proposal. Based upon our reanalysis of the cost, energy, and secondary air emission impacts of the regulatory options considered for the final rule we have decided not to revise the kraft condensate standards.

73. Comment: Commenter 0162 stated that the proposed increase to the condensate treatment standard inappropriately fails to address the need to account for treatment system variability in both biological treatment systems and steam strippers.

Biological Treatment System Variability. Commenter 0162 explained that during the original development of the standards, four HAPs were identified in pulping condensates: methanol, propionaldehyde, acetaldehyde, and MEK (the latter is no longer a HAP, by definition, but is still included in subpart S). For the HAPs other than methanol, technology did not exist to measure concentrations below 1 ppm. Given that the concentration of these three non-methanol compounds is typically below 1 ppm in ASBs, there were uncertainties in quantifying and estimating the biotreatment efficiencies for these compounds during the timeframe of the original rulemaking. Facilities were, therefore, given the following option to demonstrate "treatment equivalency" for non-methanol HAPs:

- As a worst case, assume 0 percent treatment efficiency for non-methanol HAPs in biotreatment systems.
- In lieu of treating these non-methanol HAPs, demonstrate equivalency by treating an additional quantity of methanol equivalent to the amount of non-methanol HAPs.

The commenter explained that the industry agreed to the development of an "r-factor"– the mass ratio of non-methanol HAPs to methanol HAPs—as a means to establishing this treatment equivalency. More details on the r-factor approach were provided as part of the NCASI Interim comments (Attachment 4 to comment 0162). When using a nominal average "r-factor" of 0.02 (based on NCASI studies), this treatment equivalency demonstration means that the actual $F_{bio,\ methanol}$ has to be 94 percent in order to achieve an adjusted F_{bio} of 92 percent. This compliance aspect was essentially written into the rule and is not an option. Therefore, ASBs, as currently regulated, have to operate at a higher standard with respect to methanol removal than strippers.

NCASI reviewed the reported treatment efficiencies in the ICR responses. A compilation of data on "intra-facility" variability in ASB performance, extracted from the 2011 pulp and paper ICR, was provided as part of interim comments submitted by NCASI (Attachment 4 to comment 0162). The average "intra-facility" variability in $F_{bio,\ methanol}$ was about 5 percent according to these data. The commenter stated that, if mills are required to increase treatment of all HAPs from 92 to 94 percent, the actual methanol removal efficiency would now have to be 96 percent, which is an unrealistic mandate after accounting for operational variability of 5 percent. The commenter charged that EPA had not performed an analysis on whether this level of ongoing control was feasible, and it was unclear whether upgrades to systems would even be feasible or effective if implemented.

Steam Stripper Variability. Commenter 0162 explained that steam strippers used for subpart S compliance were designed and sized based on the collection and treatment requirements. These units are maintained to stay above the required treatment levels for compliance margin purposes (based on surrogate parameters). The commenter noted that reported efficiencies for steam strippers are generally based on the 3-run initial performance test (conducted when units were new or after maintenance, which represents an optimized performance level of the unit and not a sustained performance level). The results reported are expected, as the unit should perform at or near the peak of system design during the performance test, as this is generally when the unit is "clean" and operating at its highest efficiency and not representative of the minimum efficiency the unit can sustain between maintenance outages/cleanings. While the units can have higher "peak" efficiencies, most were designed to achieve a continuous treatment efficiency of 92 percent. If the performance tests results were not over 92 percent with a good margin of safety, a facility could not have confidence that the unit would be able to continuously meet the treatment standards.

Response: With regard to biotreatment system variability, we reviewed the site-specific r-factor values reported in the ICR and agree that this mass ratio of non-methanol HAPs to methanol HAPs is typically around 0.02, reflecting that approximately 2 percent of the measured HAP are non-methanol HAP. The maximum value of "r" reported in the ICR responses was 0.06, and the average was 0.017. Since MEK is no longer a HAP, we considered whether to remove it from the group of HAPs to be included in the r-factor, but decided that MEK's small contribution to "r" has little effect on the compliance calculation, and, therefore, did not amend the equation. We agree with the commenter's assessment of the r-factor's impact (*i.e.*, that it can lead mills to operate their biotreatment systems to remove 96 percent methanol in order to compensate for the non-methanol HAP). We also reviewed the average "intra-facility" variability in $F_{bio,\ methanol}$ reporting in the ICR results and noted an average $F_{bio,\ methanol}$ variability of 4 percent.[125]

Regarding steam stripper variability, we acknowledge that some of the data reported in the ICR and used to asses steam stripper performance was IPT data. However, many ICR respondents provided more recent repeat performance test data. We considered all of the reported performance levels in our reanalysis.

[125] See memorandum from T. Holloway, K. Hanks, and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA, titled *Costs, Environmental, and Energy Impacts for the Promulgated Subpart S Risk and Technology Review*, Appendix A3, May 15, 2012, in the docket for the subpart S rulemaking.

When considering all treatment systems (biotreatment and steam strippers), we noted from our reanalysis of performance data that mills are, on average, operating with a margin for variability of about 4 percent removal, or 50 percent on a lb/ODTP basis. As noted extensively by commenters, the reasons for operational variability vary from mill to mill, and include the need for condensate over-collection and/or over-treatment to ensure compliance with the lb/ODTP treatment standard or CCA; or over-treatment to ensure compliance with the percent reduction or ppmw standard. Operational variability was factored into our reanalysis of the costs and impacts of the revised condensate treatment standards. After accounting for variability and other comments related to our impacts analysis (*e.g.*, the need to account for steam stripper energy impacts), we found that the 93 and 94 percent removal condensate treatment options under consideration for the final rule were not cost-effective and resulted in undesirable energy and secondary air emissions impacts. Therefore, we have decided not to promulgate revisions to the kraft condensate standards.

74. Comment: Need for Flexibility. Commenter 0162 described the ongoing need for flexibility. The commenter contended that implementation of MACT was successful in reducing emissions and health risks from the pulp and paper subpart S subcategory, and that this success was partly due to the flexibility of compliance alternatives. There are currently three collection and four treatment compliance approaches along with the CCA and "equivalency-by-permit" options. Every mill is different in its approach to achieve compliance with the standard. These differences include:

- The quantity and quality of the condensates generated at the mill,
- The compliance approach for MACT I Phase 2 (collect HVLC streams or use the CCA option),
- The control devices and options used to achieve the treatment standards (dual treatment systems, over-collection of condensates to compensate for lower treatment efficiencies, *etc.*), and
- Pulping technology options (*e.g.*, continuous and batch digesters), heat balances, sulfidity, equipment arrangements, ambient conditions, space limitations, receiving water constraints, water supply limitations.

The commenter stressed that ongoing flexibility was imperative to ensure that mills can maintain compliance (minimize emissions and residual risk) and manage energy use while staying competitive in a global marketplace. The proposal to raise the treatment standard from 92 percent to 94 percent jeopardizes compliance for facilities that designed their collection and treatment systems to achieve compliance with the current standard. The proposed treatment standards of 12.8/8.3 lb/ODTP (bleached/unbleached) threaten to negate the lb/ODTP treatment compliance approach, as well as the CCA and equivalency by permit (EBP)[126] MACT I, Phase 2 compliance alternatives. While the rule offers other options for collection and treatment, mills cannot easily convert compliance approaches without significant costs. The industry spent over $1 billion to achieve compliance with the pulp and paper MACT standards, and the end result was an acceptable level of residual risk. It is not reasonable and is legally unwarranted to make changes to the standards that have significant financial impacts and remove flexibility, when

[126] Under §63.94, a facility can propose an alternative compliance approach that would be equivalent (plus other benefits) to compliance with the standard. It is similar to the CCA in that it offers flexibility, but it allows the facility to determine the approach. For example, a facility could decide to control the vents of the Black Liquor Oxidation System (BLOx) as part of the EBP approach.

there is acceptable residual risk and minimal benefit to the environment from further tightening the standards. The EPA failed to make an adequate demonstration in its analysis and record for changes of this magnitude, and, thus, current requirements should be retained.

Response: We acknowledge the site-specific nature of mills' subpart S compliance strategies and expenditures (in terms of capital and engineering time) that have accompanied MACT compliance. In our reanalysis of the survey data, we reviewed the performance levels of each mill using the various percent reduction and equivalent lb/ODTP and ppmw options (for bleached vs. unbleached mills). We further considered the impact of revisions to the condensate standards on CCA mills as part of our reanalysis of the kraft condensate regulatory options. Of the 38 CCA mills, we estimated that the CCA compliance approach could potentially be negated by the condensate standard revisions at 11 mills, and that these mills would switch from the CCA to use HVLC controls. Switching from CCA to HVLC control was estimated to cost $15 million in capital and $1.89 million/year per mill. We also estimated that 34 of the 38 mills would be required to repeat their CCA compliance demonstration, at a cost of $130,000 per mill.[127] Consideration of these costs, and the fact that mills are required to achieve greater HAP emission reduction through CCA than would have been achieved through compliance with the HVLC pulping vent gas standards, contributed to our decision not to promulgate the proposed revisions to the kraft condensate standards under the section 112(d)(6) technology review. The number of available condensate compliance approaches under subpart S has not changed as result of our final technology review.

75. Comment: Commenter 0163 submitted a copy (0163.1) of an NCASI document entitled, "Demonstrating Compliance with Methanol Collection and Treatment Under Subpart S – Implementation Aspects." The document notes that demonstrating compliance with both collection and treatment requirements is a two-step procedure:

1. Demonstrating the 11.1 lb/ODTP and 7.2 lb/ODTP collection requirement, and
2. Demonstrating either the 92 percent removal OR the corresponding lb/ODTP removal requirement.

The document addresses the inherent variability in the amount of methanol collected in condensates and, when combined with operational variability in control efficiencies of the treatment device, highlights the importance of over-collection and compliance flexibility for demonstrating continuous compliance under the requirements of the current standard (compliance at all times or equivalent to a 99 percent+ compliance probability).

Elements of this document were also submitted with comment 0162 and are summarized above. The document refers to NCASI's February 18, 2012 interim comments and includes an attachment entitled "Establishing Averaging Periods for Condensate HAP Collection" prepared by NCASI (the same document as Attachment 7 to comment 0162 noted above).

Response: We acknowledge submittal of the NCASI document, "Demonstrating Compliance with Methanol Collection and Treatment Under Subpart S – Implementation Aspects", and its attachments. The information in this document was reviewed and taken into

[127] See memorandum from T. Holloway, K. Hanks, and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA, titled *Costs, Environmental, and Energy Impacts for the Promulgated Subpart S Risk and Technology Review*, May 15, 2012, in the docket for the subpart S rulemaking.

consideration in our reanalysis of the kraft condensate performance levels. As noted above, EPA has decided not to revise the kraft condensate standards upon further consideration of the operational and performance variability inherent in condensate collection and treatment systems and the costs, energy, and secondary air emission impacts associated with the 93 and 94 percent removal options analyzed for the final rule.

76. Comment: Commenter 0162 stated that the proposed concentration limit for condensate treatment for bleached mills was inconsistent with background documents. The commenter stated that, in the preamble to the proposed rule (76 FR 81345) and EPA's memo dated October 23, 2011, Table 2 states that the equivalent concentration for bleached mills is 248 ppmw.[128] However, in the proposed rule, the concentration is listed as 210 ppmw.[129] The commenter noted that the proposed rule needed to be modified to be consistent with the analysis in the docket.

Response: We carefully reviewed the proposed rule sections noted by the commenter and did not see the issue. The proposed revised limit for bleached mills was 248 ppmw. (The originally promulgated limit for unbleached mills was 210 ppmw.) As noted above, EPA has elected not to promulgate the proposed revisions to the kraft condensate standards. The original subpart S ppmw limits for kraft condensates have been retained.

[128] See memorandum from J. Bradfield and K. Spence, EPA, to Docket EPA-HQ-OAR-2007-0544 titled *Summary of Kraft Condensate Control Technology Review*, page 7, October 23, 2011, in the docket for the subpart S rulemaking.
[129] 76 FR 81354, proposed rule §63.443(4)

4. Unregulated Sources

77. Comment: Commenter 0218 stated that EPA unlawfully failed to set a standard to control all pollutants when the EPA set the initial section 112(d) standard in 1998. The commenter quoted text from 63 FR 18504, 18510, specifically the statements that "MACT for chloroform at these mills is no control" and "EPA will also determine whether it is appropriate to revise MACT (pursuant to CAA section 112(d)(6)) in order to control chloroform emissions at those mills." The commenter noted that EPA also stated that it was deferring control of Cl_2 emissions. The commenter was unclear as to whether EPA ever fulfilled its duty to set a section 112(d) standard for Cl_2. The commenter noted that EPA's emission dataset shows 356 tons per year of chloroform and 24 tpy of Cl_2.[130] The commenter asserted that EPA cannot justify failing to set standards to control these pollutants, and must set a section 112(d) standard in this rulemaking to comply with sections 112(d)(1), 112(d)(2), and *National Lime Ass'n*.[131]

Commenter 0218 pointed out that the EPA's original standard also stated that "[t]here are no control requirements for pulping systems or process condensates at [Mechanical Pulping Mill, Secondary Fiber Pulping Mill, Non-wood Pulping Mill, and Papermaking System] mills. For papermaking systems, there are no control requirements." 63 FR 18510-11. The commenter also noted that EPA also exempted wood yard operations (including wood piles), tall oil recovery systems at kraft mills, emissions from weak liquor storage tanks (even though some tanks are controlled), and bleaching systems that use hypochlorite and non-Cl_2 compounds. *Id.* at 18,519-20, 18,525.

The commenter stated that for these pollutants and sources, EPA must consider and set a standard, based on the emission reductions achieved and now achievable, using various technologies, practices, processes, and input materials now available, and this standard must satisfy section 112(d)(2)-(3).

Response: In the initial standard in 1998, the EPA "propose[d] to authorize Bleached Papergrade Kraft and Soda subcategory mills under certain circumstances to submit a certification based on process changes in lieu of monitoring for chloroform" (63 FR 18504). This process change was the conversion from Cl_2 bleaching to TCF or ECF bleaching, which resulted in a significant reduction of chloroform emissions. The EPA also stated "[w]ith respect to chloroform emissions from bleaching systems, EPA is closely correlating the air and water standards. This is because EPA is relying on the same process change technology basis to control both chloroform emissions to air and pollutant discharges to water. Thus, MACT to control chloroform for bleaching systems requires a mill either to meet the applicable baseline effluent limitations guidelines and standards for all pollutants being promulgated today under the CWA or to certify that Cl_2 and hypochlorite are not used in the bleaching system." Chlorine emissions are controlled through the use of bleach plant scrubbers, which are required to remove 99 percent of bleach plant HAPs, including Cl_2. For both of the stated reasons, the EPA has set a standard to control Cl_2 and chloroform.

[130] See U.S. EPA's *Residual Risk Assessment for the Pulp & Paper Source Category* at 31, in the docket for the subpart S rulemaking.
[131] See 233 F.3d at 639; 42 U.S.C. 7412(d)(1), (d)(2).

We disagree with the commenter that section 112(d)(6) mandates that the EPA must correct any deficiency in an underlying MACT standard when it conducts the "technology review" under that section. Section 112 does not expressly address this issue, and the EPA has discretion in determining how to address a purported flaw in a promulgated standard. CAA section 112(d)(6) provides that the Agency must review and revise "as necessary." The "as necessary" language must be read in the context of the provision, which focuses on the review of developments that have occurred since the time of the original promulgation of the MACT standard and, thus, should not be read as a mandate to correct flaws that existed at the time of the original promulgation. We intend to further investigate potentially deficient standards and plan to address them in a future sector rule proposed under section 112(d)(2) and (3).

78. Comment: Commenter 0153 stated that the EPA should amend the affected source definition in §63.440(b) to include all of the affected sources in the definition of CCA affected source at §63.447(a)(1) (*i.e.*, Clean condensate alternative affected source means the total of all HAP emission points in the pulping, bleaching, causticizing, and papermaking systems (exclusive of HAP emissions attributable to additives to paper machines and HAP emission points in the LVHC system).

The commenter suggested that the EPA change the current definition found in §63.447(a)(1) to remove the exclusion of HAP additives from the CCA in order to allow for new additive technology development. The commenter stated that two mills in the RTR are currently controlling HAPs in papermaking using easily transferable techniques such as white water temperature control and careful choice of the fresh water introduction point. The commenter suggested that the CCA has allowed for these new technologies to be developed and either numerical limits and/or work practices could be established for papermaking systems.

Response: The EPA agrees that the affected source definition in §63.440(b) should be changed to include causticizing and papermaking systems when standards are set for those emission points. We intend to explore these points in a future sector rule proposed under section 112(d)(2) and (3).

The HAP emissions from HAP-containing paper machine additives were found to be negligible during the promulgation of the original rule. We reexamined the issue in our review of the 2011 Part I survey responses and reached the same conclusion as before. Additionally, all facilities must currently be in compliance; therefore, we do not expect any future CCA requests that would warrant adjustment to the affected source definition. We agree with the commenter that either numerical limits and/or work practices can be established for papermaking systems; we plan to address this in a future sector rule proposed under section 112(d)(2) and (3).

79. Comment: Commenter 0225 stated that "ponds" are an unregulated source. Emissions from the ASBs are not regulated at all, even though by PTPC's 1993 study, those are some of the worst fumes to come from the PTPC mill. The commenter asserted that emissions sources must be included.

The commenter submitted an NCASI report (comment attachment 0225.4) of a project undertaken to estimate the emissions of compounds from the ASB at PTPC in response to Agreed Order #5771, Item number 3. This project combined field studies with modeling work to

estimate the annual emissions of methanol, propionaldehyde, MEK, and TRS compounds from the system. The study plan for this project was communicated to the Department of Ecology on January 29, 2009. The NCASI report concluded that, relative to other industry wastewater treatment sources, the emissions estimated are on the low end of what has been measured and studied and the treatment system appears to do an excellent job of destroying these compounds before significant air releases occur. The estimated emission rates were 104 tpy methanol, 13 tpy acetaldehyde, 1.4 tpy propionaldehyde, 2.6 tpy MEK, and 58 tpy TRS.

Response: Aerated stabilization basins at facilities which treat their kraft pulping process condensates are considered to be regulated sources. Facilities meeting §63.446(e)(2) are required to discharge condensate below the liquid surface of a biological treatment system and to treat the condensates to destroy total HAPs by 92 percent by weight, or to remove 6.6 or 10.2 lb of HAP per ODTP (unbleached/bleached), or to achieve a total outlet HAP concentration of 210 or 330 ppmw or less (unbleached/bleached). The PTPC mill uses biotreatment to control kraft condensates, and they over-control collection and treatment for the CCA. The MEK and TRS emissions to which the commenter is referring are not HAP emissions, and, therefore, are outside the scope of the pulp and paper subpart S RTR. The reported HAP emission rates that PTPC provided for the ASB in their pulp and paper Part I ICR survey response are: 48.6 tpy methanol, 9.5 tpy acetaldehyde, and 1.2 tpy propionaldehyde. Emissions estimates for the non-HAPs MEK and TRS were not provided. The reported HAP emission rates were estimated using the EPA wastewater model WATER9 for the period from January 2, 1009 to December 31, 2009, which is somewhat more recent than the NCASI study cited by the commenter. After the subpart S proposal, the mill submitted a revised acetaldehyde emission rate of 6.3 tpy for the ASB, which was estimated using WATER9, but based on more recent mill data from 2010 and 2011 that accounted for process improvements.

5. Startup, Shutdown, and Malfunction

5.1 Authority for Removal of the SSM Exemption

80. Comment: Commenter 0218 offered their support of the removal of certain startup, shutdown, and malfunction exemptions, stating that all such exemptions are unlawful and must be removed.

Response: We acknowledge this comment.

81. Comment: Commenter 0225 stated that SSM plans are worthless without implementation. The commenter cited an incident where, in 2009, PTPC was required to present a plan for estimating emissions from the unregulated ASB/settling ponds. PTPC presented a plan, but the ponds' emissions remain unregulated. Startup-shutdown creates some of the worst emissions from the PTPC mill. One of the units is said to cycle two times daily to save energy. That's a laudable goal, but the rules were designed for a few times annually. If the pollution increase from shutdown-startup is worse in terms of pollution than the benefit of saving energy, then nothing is gained except fuel savings.

Response: We acknowledge the commenter's concern regarding SSM plans; however, facilities will be required to meet the standard at all times, including during periods of startup and shutdown. The applicability of a standard during malfunction events will ensure that sources have ample incentive to plan for and achieve compliance. Consequently, SSM plans are no longer required. The emissions from the ASB/settling ponds are regulated through the subpart S kraft condensates standards as discussed in section 4.

Regarding the comment that "[o]ne of the units is said to cycle two times daily to save energy," we are not sure what equipment the commenter is referring to, as there are numerous different types of equipment operated at pulp and paper mills.

82. Comment: EPA's Regulatory Authority. Commenters 0162 and 0172 argued that EPA does not have authority to amend existing MACT standards to make them more stringent. The commenters stated that the proposed SSM provisions are changes to existing MACT standards that EPA promulgated previously pursuant to CAA sections 112(d)(2) and (3) for the NESHAP category. According to the commenters, the CAA does not contemplate EPA returning to previously issued MACT standards to fill "gaps" or re-determine the MACT "floors." The commenters asserted that Congress instead established two distinct procedures for establishing standards more stringent than the original MACT standards: the 8-year review for new developments in practices, processes, and control technologies under CAA section 112(d)(6), and the review of MACT standards to determine whether more stringent limitations are necessary to protect human health under the CAA section 112(f)(2) "residual risk" review.

Commenter 0162 acknowledged that EPA did not invoke its section 112(d)(6) authority to support the proposed SSM provisions (76 FR 81328), but argued that, even if it had, section 112(d)(6) does not provide broad authority to reconsider aspects of previously issued MACT standards unrelated to "developments in practices, processes, and control technologies." The commenter concluded that EPA cannot simply revisit and redo a MACT determination long after

it has been issued, which the commenter said EPA attempted to do with the proposed SSM provisions. The commenter argued that EPA cannot merely change its mind about what standards are required to comply with CAA sections 112(d)(2) and (3), nor can it recalculate a MACT "floor" based on subsequent performance. Cf. *NRDC v. EPA*, 529 F.3d 1077, 1084 (D.C. Cir. 2008) (rejecting contention that CAA section 112(d)(6) requires EPA to "start from scratch" and develop new MACT standards).

According to commenter 0162, reassessing existing NESHAPs now, that were based on the MACT "floor" years ago, and imposing more stringent requirements, would be inconsistent not only with the statute's careful provision of technology-review and residual-risk authority to follow establishment of MACT standards, but also with Congress's desire for finality evident in the judicial review provisions of CAA section 307(b). The commenter noted that challenges to MACT standards need to be raised within 60 days of their promulgation. The commenter maintained that this provision ensures that regulated entities, EPA, and the public know what emission limitations will apply to a source, rather than having those limitations be subject to flux. The commenter pointed out that, in the current case, facilities regulated by the NESHAPs long ago made capital investment decisions and developed and honed their operating procedures to meet the existing MACT standards. According to the commenter, the CAA does not allow EPA simply to revisit the analysis and decisions involved in developing emission standards that meet the requirements of CAA sections 112(d)(2) and (3).

Commenter 0162 further argued that, even if EPA did have authority to go back and change the existing MACT standards, it would have to justify why the decisions reflected in the current standards are wrong and why the new standards meet the required criteria that EPA must satisfy in issuing MACT standards under CAA sections 112(d)(2) and (3). According to the commenter, EPA has not made either showing in the proposed rule. The commenter stated that EPA also would be required, under CAA section 112 and EO 13563, to assess the costs and benefits of eliminating the SSM provisions in the current subpart S standards. The commenter noted that EPA made no attempt to assess the costs and benefits or even identify what changes pulp and paper mills might make to their facilities in response to the elimination of the SSM provisions.

Another commenter (0164) contended that the approach EPA is taking fails to account adequately for emissions that occur during SSM periods. The commenter stated that EPA based its actions on an incorrect reading of the D.C. Circuit Court's *Sierra Club v. EPA* decision (551 F.3d 1019 (D.C. Cir. 2008), *cert. denied*, 130 S. Ct. 1735 (2010)), and on unreasonable or insufficiently supported assumptions about SSM events and emissions during SSM periods. According to the commenter, EPA has proposed to change regulations that have been in place for many years and whose SSM provisions were never challenged in court, without any demonstration that it has legal authority to do so and without any apparent factual analysis of the statutory criteria for standard-setting under section 112.

Commenter 0164 stated that EPA has for decades recognized, in technology-based standards under the CAA and other statutes, that in many cases it is not feasible with an identified technology to achieve the same emission limitations during SSM events as have been established for normal operations. Historically, EPA has, therefore, applied different requirements during SSM events. The EPA has not justified departing from that practice in the

proposed rule. The EPA has also not made any attempt to demonstrate that the amended standards it proposed reflect the performance actually achieved by the best-performing existing sources that formed the basis for the current subpart S standards or, alternatively, that they meet the statutory criteria for establishing beyond-the-floor MACT standards.

Commenter 0164 pointed out that the provisions in the current subpart S regulations that exempt emissions during SSM events from compliance with numerical emission limitations derived for normal operations, or that limit the duration of SSM events that result in emissions higher than the emission limitation for normal operations, were developed by EPA based on the performance of facilities identified as the "best performers" when EPA promulgated the current subpart S standards. The EPA cannot now simply disavow its conclusion that even "best performers" will exceed the emission standards established for normal operations during SSM events.

Response: The EPA does not claim that the *Sierra Club* case or the CAA constrains its authority to prescribe different standards for periods of start and shutdown or for periods of malfunction. However, as explained in the preamble to the proposed and final rules, the EPA has determined that section 112 does not require that emissions that occur during periods of malfunction be factored into development of section 112 standards. The EPA's rationale for this view is explained in detail in the preamble as well.

At proposal, we explained that the D.C. Court had recently vacated the SSM exemption contained in §§63.6(f)(1) and 63.6(h)(1) that are part of the section 112 regulations commonly referred to as the GP rule. *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008) *cert. denied*, 130 S. Ct 1735 (2010). We further explained that, when incorporated into section 112(d) regulations for specific source categories, these two provisions exempt sources from the requirement to comply with otherwise applicable MACT standards during periods of SSM. We also explained that because the pulp and paper NESHAP relies on the GP rule for SSM provisions, we were proposing to set standards that apply during startup and shutdown periods for this source category. (76 FR 81345-81346). The EPA does not claim that the *Sierra Club* case constrains its authority to prescribe unique standards for SSM periods. Rather, EPA's view is that this decision calls into question the legality of source category-specific SSM exemptions in rules promulgated pursuant to section 112.

Further, in *Medical Waste Institute v. EPA,* 645 F. 3d 420, 425-27 (D.C. Cir. 2011), the D.C. Circuit Court held that EPA may permissibly amend improper MACT determinations, including amendments to improperly promulgated floor determinations, using its authority under section 112(d)(2) and (3). The absence of standards for HAP emitted during SSM is not proper. *National Lime,* 233 F. 3d at 633-34; see also *Medical Waste Institute,* 645 F. 3d at 426 (resetting MACT floor, based on post-compliance data, permissible when the originally-established floor was improperly established, and permissibility of EPA's action does not turn on whether the prior standard was remanded or vacated). Similarly, the D.C. Circuit Court's December 9, 2011 decision *in Portland Cement Ass'n v. EPA* (D.C. Cir. No. 10-1358) confirms that EPA is not constrained by section 112(d)(6), and it may reassess its standards more often, including revising existing floors if need be. The commenters are, thus, incorrect that section 112(d)(6) provides the exclusive authority to address standards that apply during SSM events. Here, EPA adopted no MACT standard at all for HAP emitted during SSM, an approach soundly rejected by the D.C.

Circuit Court in *National Lime,* 233 F. 3d at 633-34. Consequently, we have revised the standards so the emission limits of the rule apply at all times, including during periods of SSM.

Contrary to the commenter 0162's assertion that EPA ignored the costs of the SSM revisions, EPA's proposal cost analysis included a one-time cost to revamp existing recordkeeping systems to be consistent with the proposed revisions to the startup and shutdown provisions, and included costs for asserting an affirmative defense. These costs were derived from the Paperwork Reduction Act (PRA) supporting statement developed for the proposal.[132,133] These costs have also been included in the final cost analysis and supporting statement for the subpart S final rule.

With respect to an obligation of the EPA to examine the costs and benefits of removing the SSM exemption, the EPA disagrees that such an obligation exists for removing the SSM exemptions. The costs and benefits derived as a result of implementing Subpart S were studied upon original promulgation, and here, upon review. The EPA determined those costs assuming full compliance with all applicable standards at all times, even if sources were excused from compliance during periods of SSM. The EPA does not now see the need to make any adjustments to the costs of continuous compliance, since the obligation to comply continuously has not changed. What has changed is that sources in violation of a standard are no longer exempt from sanctions during such periods.

83. Comment: Consistency with *Sierra Club v. EPA.* Commenters 0162 and 0172 argued that EPA's proposed requirement that sources must meet the same emission limitations during SSM is not required by case law and is inconsistent with past EPA practice and judicial interpretations of NESHAPs and NSPS. The commenters stated that EPA has recognized for decades that it is often unreasonable to require sources to meet technology-based emission standards, such as NSPS promulgated under CAA section 111, during SSM periods (§60.8(c)). The commenters contended that this understanding has been a critical piece of most MACT standards as well, through incorporation by reference of the NESHAP GP SSM requirements, inclusion of specific provisions for SSM events in the categorical MACT standards, or both. Despite that fact, the commenters noted that EPA proposed that the emission limitations in subpart S issued under CAA section 112 (which is modeled in part on section 111) would now be applicable at all times, even during SSM events (*e.g.*, proposed §§63.443 and 63.459).

Commenter 0162 rejected EPA's suggestion that its treatment of excess emissions during SSM events in the proposed standards is appropriate, even "required," in order to make the standards "consistent with" the D.C. Circuit Court's decision in *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008), *cert. denied*, 130 S. Ct. 1735 (2010), which vacated the exemption[134] for

[132] See memorandum from T. Holloway, K. Hanks, and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA, titled *Costs and Environmental and Energy Impacts for Subpart S Risk and Technology Review*, November 17, 2011, in the docket for the subpart S rulemaking.

[133] See U.S. EPA, *Supporting Statement: NESHAP for Pulp and Paper Production (40 CFR Part 63, Subpart S) (Proposed Amendments),* November 2011.

[134] According to commenter 0162, while the D.C. Circuit (and EPA in the preamble to the proposed rule) referred to the provision vacated in the *Sierra Club* decision as an "exemption" from HAP standards during SSM events, in fact other portions of the NESHAP GP impose various requirements that apply to sources during SSM events (including the obligation to minimize excess emissions), and in anticipation of and following SSM events (including requirements to prepare a plan to address SSM events and to report SSM events).

excess emissions during SSM events contained in the 40 CFR Part 63, subpart A GP for emission standards for hazardous air pollutants under CAA section 112 (76 FR 81345). The commenter argued that the D.C. Circuit Court's *Sierra Club* decision does not compel or even support EPA's adoption of the proposed SSM provisions, based on the following reasons.

First, commenter 0162 noted that the *Sierra Club* decision interpreted the NESHAP GP and did not by its terms address what EPA may or may not include in category-specific MACT standards. Second, the commenter noted that the *Sierra Club* decision did not say that the same emission limitations that EPA has derived for normal operations must also apply during SSM events, and the decision does not preclude EPA from applying different standards during SSM events than apply during normal operations. The commenter noted that the *Sierra Club* panel's holding only said that "there must be continuous section 112-compliant [MACT] standards" (551 F.3d at 1027). According to the commenter, the *Sierra Club* opinion noted that the definition of "emission standard" in CAA section 302(k) includes the broad phrase "any requirement relating to the operation or maintenance of a source to assure continuous emission reduction," and stated that it suggests that EPA can establish MACT standards consistent with CAA section 112 "without necessarily continuously applying a single standard."[135]

Commenter 0162 argued that there is ample precedent for EPA applying a different standard during SSM events. The commenter noted that the definition of "emission limitation" and "emission standard" in CAA section 302, which "limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis"—language which the D.C. Circuit Court considered dispositive in interpreting EPA's standards-setting authority under section 112—has been in the statute since 1977. Throughout that time, the commenter stated, EPA has not required sources to meet during SSM events the CAA section 111 NSPS emission limitations established for normal operations (§60.8(c)). The commenter pointed out that Congress had, in fact, enacted the continuous basis language in section 302(k) knowing that EPA's emissions standards under section 111 exempted SSM periods. Commenter 0162 asserted that there is nothing in the legislative history of the 1977 amendments to the CAA that suggests Congress intended to overturn that practice.[136] The commenter also pointed out that court decisions both before and

[135] See 551 F.3d at 1027. "Indeed, this reading is supported by the legislative history of section 302(k)." *Id.* See also *id.* at 1021 ("accepting that 'continuous' for purposes of the definition of 'emission standards' under CAA section 302(k) does not mean unchanging"); *id.* (referring to "the CAA's requirement that some section 112 standard apply continuously") (emphasis added). Commenter 0162 stated that, since it was addressing only a generic SSM exemption, the *Sierra Club* decision did not consider whether EPA, in the context of individual categorical standards, could determine that it is infeasible to apply the same limits, or any limits on the mass or concentration of pollutants emitted at all, during SSM events, or that it would lead to absurd results to do so.

[136] Commenter 0162 argued that the "continuous basis" language inserted in 1977 related to a debate in Congress about whether sources should be allowed to use temporary or intermittent pollution control technologies, as the D.C. Circuit recognized in *Sierra Club v. EPA*, 551 F.3d 1019, 1027 (D.C. Cir. 2008), *cert. denied*, 130 S. Ct. 1735 (2010), citing *Kamp v. Hernandez*, 752 F.2d 1444, 1452 (9th Cir.1985). See also Conference Report on H.R. 6161 (the CAA Amendments of 1977), H. Rep. No. 95-564 (August 3, 1977) at 129 (requirement to use "continuous emission controls" "clarifies that intermittent or alternative control measures are not permissible means of compliance"), 172; S. Rep. No. 94-717 (March 29, 1976) at 78 (definition of "emission limitation" being amended to clarify that "[i]ntermittent controls or dispersion techniques are unacceptable as a substitute for continuous control of pollutants" and contrasting intermittent controls, which vary based on predicted changes in pollutant dispersion due to meteorological predictions, with continuous controls such as flue-gas cleaning equipment); see also *Nat'l Lime Ass'n v. EPA*, 627 F.2d 416, 434 n.54 (D.C. Cir. 1980) ("The 'intermittent' controls that concerned Congress were any of those which entailed temporary reductions in emissions when weather conditions were poor.").

after the CAA Amendments of 1977, some of which the commenter cited below, have affirmed the appropriateness of including special SSM provisions in standards issued under section 111—despite the "continuous basis" language in the definition of "emission limitation." Similarly, the commenter noted that there is nothing in the legislative history of the CAA Amendments of 1990 that suggests Congress meant something completely different when it used the same defined terms, "emission standard" and "emission limitation," in directing EPA to establish MACT standards.

Third, commenter 0162 noted that the *Sierra Club* decision did not address whether EPA could use a "design, equipment, work practice or operational standard," as authorized under CAA section 112(h) and included in the definition of "emission limitation" and "emission standard" in CAA section 302(k), in lieu of a numerical emission limitation during SSM events. The commenter further noted that EPA told the Court that the GP SSM exemption struck down in *Sierra Club* was not an alternative standard based on the work practice standard authority. See 551 F.3d at 1028. According to the commenter, EPA argued in that case that section 112(h) was in fact irrelevant to its authority to exempt excess emissions during SSM events. ***Id.*** at 1030 (Randolph, J. dissenting).

As a result, commenter 0162 stated, EPA cannot hide behind the *Sierra Club* decision as a justification for ignoring an inability of even the "best performers" to achieve during SSM events the emission limitations that EPA has established for normal operations. The commenter further stated that the approach EPA proposed would not establish the "continuous section 112-compliant standards" that the *Sierra Club* decision concluded are required. See 551 F.3d at 1027. Commenter 0162 noted that, under CAA section 112(d)(2), MACT emission standards must be "achievable." The commenter further noted that, if EPA sets the emission standards based on the "best performing 12 percent of units in the category" (the MACT "floor"), those limitations must on average be "achieved" by the best performers (CAA section 112(d)(3); ***Sierra Club v. EPA*** (standards based on the MACT "floor" must be achievable "under the worst foreseeable circumstances").

Commenter 0162 stated that an emission limitation that applies during SSM events does not meet the requirement of CAA section 112(d)(2) that "emission standards" under that section be "achievable," if in fact EPA has not demonstrated that the limitation is "achievable" with available technology, "taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements." The commenter similarly noted that an emission limitation that applies during SSM events has not been demonstrated to be "achieved" by the best-performing 12 percent of units in the category under CAA section 112(d)(3) unless EPA can show that those best performers actually meet that

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According to commenter 0162, the language about "continuous reduction" in the definition of "emission standard" did not address what emission limitations apply during SSM periods, nor EPA's established practice of exempting excess emissions during SSM events from the performance standards applicable to normal operations. The commenter stated that, in fact, the legislative history indicates Congress was aware that alternative emission limitations might at times be necessary, even though the emission limitations were established based on the capability of "continuous controls" like scrubbers. See, ***e.g.***, S. Rep. No. 94-717 at 78 ("It is recognized that the source controls may not be available to achieve the full reduction required of a particular source under particular circumstances. In such case, supplementary programs can and should be developed. But this flexibility occurs only after imposition of the continuous emission limitation.").

emission limitation during SSM events. According to the commenter, the proposed rule would not establish "continuous section 112-compliant standards" because, as discussed below, EPA has not demonstrated that the emission limitations in the existing MACT standards, if they also applied during SSM events, would comply with section 112 when applied to SSM periods.

Commenter 0162 asserted that this plain-language reading of the applicable statutory requirements is echoed by extensive case law. According to the commenter, the courts have long recognized that a "technology based standard discards its fundamental premise when it ignores the limits inherent in technology." *NRDC v. EPA*, 859 F.2d 156, 208 (D.C. Cir. 1988). As an example, the commenter cited the D.C. Circuit Court decision in *Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375, 398 (D.C. Cir. 1973), a decision reviewing standards under CAA section 111, which the commenter said recognized that "'start-up' and 'upset' conditions due to plant or emission device malfunction, is an inescapable aspect of industrial life and that allowance must be made for such factors in the standards that are promulgated." *Id.* at 399. As a second example, the commenter cited *Essex Chem. Corp. v. Ruckelshaus*, 486 F.2d 427, 432 (D.C. Cir. 1973), *cert. denied*, 416 U.S. 969 (1974), another section 111 case, in which the Court held that SSM provisions are "necessary to preserve the reasonableness of the standards as a whole." *Id.* at 433. The commenter further cited *National Lime Ass'n v. EPA*, 627 F.2d 416 (D.C. Cir. 1980), another case reviewing emission standards promulgated under CAA section 111, in which the Court held that the analogous CAA requirement that NSPS be "achievable" means that the standards must be capable of being met "on a regular basis," including "under most adverse circumstances which can reasonably be expected to recur," including during periods of SSM. 627 F.2d at 431 n.46.

According to commenter 0162, courts have reached a similar conclusion when considering the analogous CWA requirements that EPA establish technology-based effluent limitations based on the best available control technology. The commenter noted one such case, in which the 9th Circuit Court held that, where EPA knew that there would be periods where a discharger, even with "exemplary use of" the identified best technology, would exceed the effluent limitations because of conditions "beyond the control of the permit holder," EPA had violated the CWA by failing to provide an "upset provision" to address those periods. *Marathon Oil Co. v. EPA*, 564 F.2d 1253, 1273-74 (9th Cir. 1977). The commenter also cited *NRDC v. EPA*, 859 F.2d at 207, distinguishing between technology-based effluent limitations, where some provision for "upsets" is required, and water-quality-based effluent limitations, which are tied to achieving water quality standards rather than based on available technology, and, therefore, need not include an upset provision.[137]

[137] According to commenter 0162, he *Weyerhaeuser Co. v. Costle* decision that EPA cites in the preamble to the proposed rule, 590 F. 2d 1011 (D.C. Cir. 1978), does not support EPA's position (76 FR 72535). The commenter noted that, in that case, the court was discussing a "technology forcing" standard, rather than one, like MACT, that is to be based on what is already being "achieved" or has been demonstrated to be achievable. The commenter further noted that the SSM events that EPA acknowledges are expected to occur at sources subject to the proposed standards are a far cry from the "'uncontrollable acts of third parties,' such as strikes, sabotage, operator intoxication, or insanity" that the Court was considering in the passage quoted by EPA, (76 FR 7535, col. 1). The commenter pointed out that industry is not requesting that the MACT standards provide relief from numerical emission limitations during those unusual types of events. The commenter also noted that the *Weyerhaeuser* decision, perhaps most importantly, came long before *NRDC v. EPA*, 859 F.2d 156 (D.C. Cir. 1988) which, the

According to commenter 0162, the 1977 CAA Amendments support the conclusion that emission standards need to deal with the inability of a source to meet the normal emission limitations during particular circumstances. The commenter further noted that the *National Lime Ass'n* decision discussed above, which relied in part on the cases EPA referenced in the preamble, and which directly addresses the need for emission limitations that address reasonably anticipated adverse circumstances, post-dates the CAA Amendments of 1977 by 3 years.

According to commenter 0162, the *Sierra Club* decision does not prevent EPA from adopting emission standards for SSM periods that are different from those required during periods of normal operation, nor does it mean that EPA is barred from using a "requirement relating to the operation or maintenance of a source to assure continuous emission reduction" as the emission standard that applies during such events (551 F.3d at 1027). According to the commenter, the *Sierra Club* decision only rejected EPA's assertion that it had discretion to decide not to impose any emission standard covering SSM periods (*Id.* at 1027-28, 1030 (noting that EPA was not claiming that the GP SSM exemption was either an emission standard under CAA section 112(d) or a design, equipment, work practice, or operational standard under section 112(h)).[138]

Commenter 0162 concluded that, despite EPA's implications to the contrary, the *Sierra Club* decision expressly recognized that different standards, including non-numerical standards, may (and in some cases must) apply during non-standard operating conditions, such as SSM.

Commenters 0163 and 0212 also disagreed that the court decision requires the EPA to set numerical emission limits for startup or shutdown periods. Commenter 0163 noted the *Sierra Club* decision [*Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008), *cert. denied*, 130 S. Ct. 1735 (2010)] vacated the broad emission standard exemption during SSM events contained in the 40 CFR part 63, subpart A GP. Commenter 0163 held that the court decision did not say that the same emission limitations that EPA has derived for normal operations must also apply during SSM events, and, therefore, does not preclude EPA from applying different standards during SSM events than standards that apply during normal operations. Commenter 0163 referred EPA to detailed comments on this issue on the proposed NESHAP modifications for the Mineral Wool and Ferroalloys industries by *ad hoc* SSM Coalition, to which the commenter is affiliated as a member of American Wood Council.

Commenter 0164 stated that applying the same emission standards even during SSM periods is not compelled by the statute nor by applicable case law, including the *Sierra Club v. EPA* decision. The commenter (0164) provided several options for setting MACT standards for

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commenter noted above, affirmed the need for an upset provision to address circumstances where compliance with effluent limitations is impossible through no fault of the permittee, and which endorsed *Marathon Oil*.

[138] According to commenter 0162, the statement in the majority opinion that "Congress gave no indication that it intended the application of MACT standards to vary based on different time periods," 551 F.3d at 1028: (1) is contradicted by other statements in the opinion, referenced above, that a MACT standard need not continuously apply a single emission limitation, (2) is *dicta*, because that was not the situation presented by the challenged regulations and argued by EPA, (3) ignores the extensive case law about technology-based limitations referenced above, and (4) does not in any event say that the CAA precludes EPA from adopting different emission limitations that apply during SSM events.

such periods, including establishing a design, equipment, work practice, or operational standard under CAA section 112(h).

Response: As explained earlier, we are setting standards that apply during startup and shutdown periods in response to the decision vacating pertinent provisions in the GP rule. The EPA does not claim that the Sierra Club case constrains its authority to prescribe different standards for periods of start and shutdown. The EPA has agreed in other actions that separate standards for such periods may be appropriate. However as explained in the preamble to the proposed rule, "the EPA has taken into account startup and shutdown periods and is not proposing a different standard for those periods. Nothing in the record suggests that the operations (and attendant emissions) are significantly different during startup or shutdown than during normal operations." 76 FR 81346 (Dec. 27, 2011) The EPA received no information to cause us to question our original assertion. As such, the EPA believes that operations and emissions do not differ from normal operations during these periods such that a separate standard is warranted.

In addition, section 112(h) allows EPA to use work-practice standards instead of an emissions floor "if it is not feasible in the judgment of the Administrator to prescribe or enforce an emission standard." Under section 112(h)(2)(B), it is "not feasible" to set an emission standard when "the application of measurement methodology to a particular class of sources is not practicable due to technological and economic limitations." Thus, section 112(h) "allows EPA to substitute work practice standards for emission floors only if measuring emission levels is technologically or economically infeasible." *Sierra Club v. EPA*, 479 F. 2d 875, 880 (D.C. Cir. 2007).

Here, we do not have a basis to prescribe work practice standards. As discussed in detail in section 5.2, we have reviewed the information available to us regarding startup and shutdown periods, and we expect that startup and shutdown emissions (as indicated through the continuous compliance requirements implemented for subpart S) are not likely to cause a violation of the standards. We also found no evidence which suggested emissions were higher during startup or shutdown that would indicate a need for an alternate standard for these periods. The EPA is, therefore, promulgating the same standards that apply during normal operation for the pulp and paper industry for periods of startup and shutdown. Contrary to the commenter's argument, we expect that the standards that apply during startup and shutdown periods will establish "continuous section 112-compliant standards" that the *Sierra Club* decision concluded are required.

We disagree with the commenters' suggestion that *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008) is not relevant because it addressed the SSM exemption in the GP and did not address what EPA may or may not include in category-specific MACT standards. The holding in *Sierra Club* that emissions limitations under section 112 must apply continuously is clearly applicable to category-specific MACT standards.

For periods of malfunction, EPA provided a detailed justification for its approach to malfunctions in the preamble to the proposed rule. As the D.C. Circuit Court noted in *Sierra Club v EPA*, 167 F. 3d 658 (D.C. Cir. 1999), the phrase "average emissions limitation achieved by the best performing 12 percent of units" in section 112 of the CAA "says nothing about how

the performance of the best units is to be calculated." *Id.* at 661. Congress has not directly addressed the issue of whether emissions that occur during periods of malfunction must be taken into account in calculating the performance of the best units, and EPA's approach to malfunctions is reasonable for the reasons set out in the preamble to the proposed rule. The EPA further explained that the performance of units that are malfunctioning is not reasonably foreseeable and cited to case law supporting its approach to malfunctions. See *Sierra Club* at 665 (discussing the need to take into account the worst *reasonably foreseeable* performance).

Further, the relevance of *Portland Cement* and *Essex Chem. Corp.* is questionable in light of subsequent case law and the 1977 amendments to the CAA's definition of emission standard, requiring that such standards be continuous. We agree that the *Weyerhaeuser* case interprets provisions of the CWA that are different in nature than provisions governing standards under section 112. Nevertheless, the case supports the general proposition for which it was cited ("no general limit…can anticipate all upset situations…. After a certain point, the transgression of regulatory limits …must be a matter for the administrative exercise of case-by-case enforcement discretion, not for specification in advance by regulation."). The commenter's reliance on the *NRDC* case is inconsistent with its view that the CWA cases are not directly on point. Further, the discussion of technology-based standards in that case is dicta. The EPA's overall approach to malfunction events in this rule, including the promulgation of an affirmative defense, is consistent with the approach set forth in EPA's 1972 proposed rules cited favorably in *Portland Cement* and *Essex Chemical*, in that both EPA's approach today and in 1972 impart a construction of "reasonableness" to the standards as a whole and adopts a more flexible system of regulation than can be had by a system devoid of "give." *Portland Cement* at 399. *Portland Cement* and *Essex* criticized EPA regulations that contained no specific provisions to address malfunctions and EPA's assertion that malfunctions would be dealt with by the informal exercise of discretion in the Agency's enforcement activities. Those decisions did not require exemptions or less stringent standards for malfunction events as the commenter suggests. The EPA's approach to malfunctions goes further than reliance on the informal exercise of enforcement discretion, in that it includes regulatory provisions establishing an affirmative defense to civil penalties for exceedances of emission limits that are caused by malfunctions. As noted above, the *NRDC v. EPA*, 859 F. 2d 156, 207 (D.C. Cir. 1988) case cited by the commenter is not on point, and the discussion of technology-based standards is *dicta*. Nevertheless, EPA's approach to malfunctions is also consistent with *NRDC*. *NRDC* does not require exemptions or less stringent standards for malfunctions either. Further, the regulatory affirmative defense being included in the subpart S final rule is consistent with the case cited in the *NRDC* decision; *Marathon Oil Co. v. EPA*, 564 F.2d 1253, 1272 (9th Cir. 1977). The court in *Marathon Oil* held that EPA must formalize its approach to upsets under the CWA. The affirmative defense does so. See, *Mont. Sulphur & Chem. Co. v. United States EPA*, 2012 U.S. App. LEXIS 1056 (5th Cir. Jan 19, 2012) (in rejecting industry argument based on *Marathon Oil* that reliance on the affirmative defense was not adequate, the court stated "[h]owever, here the EPA does not rely on enforcement discretion alone, but specifically promulgates an affirmative defense in the FIP, which clearly defines the requirements to avoid penalties."). But see, *Weyerhaeuser v. Costle*, 590 F.2d 1011, 1057-58 (D.C. Cir. 1978) (holding that an informal approach is adequate). In fact, the affirmative defense comports with the court's suggestion in *Marathon Oil* that EPA place the burden on the permit holder of producing the relevant data and proving that the upset could not have been prevented. *Id*.

The EPA disagrees with commenters' suggestion that the existence of an SSM exemption in rules implementing section 111 in 1977 when Congress enacted the continuous basis language in the definition of emission standard is evidence that Congress approved of that regulatory exemption. Commenters fail to cite legislative history or any other evidence supporting that Congress was aware or approved of that exemption. The Congressional history cited by the commenter does not demonstrate that Congress approved of the SSM exemptions. Rather, the history cited by the commenter discusses the concept of controls that are intermittent by design, and that can be turned on and off for periods of time at the discretion of the owner operator. Citing such language in the historical record confounds the concepts of intermittent controls that are controlled and intermittent by design, with controls that are intermittent because they have malfunctioned. Further, in relying on this legislative history, commenters fail to distinguish between standards that are not continuous because exemptions create periods during which no standard applies and standards that contain alternative emissions limitations that apply during certain periods.

84. Comment: General Provisions. Commenter 0162 noted that, in the preamble on page 81346 of the proposed rule, EPA requested comments "on whether there are any such provisions that we have inadvertently incorporated or overlooked" in reference to the proposed changes in SSM language. While the commenter disagreed with the proposed changes noted above, the commenter reviewed the rule and was not aware of any cases where the proposed rule was inconsistent with EPA's intent.

Response: We thank the commenter for taking the time to review the GP references. We have made several changes to the final rule language related to SSM, including:

- Clarification that the affirmative defense provisions apply to violations of standards due to malfunctions, as defined in 40 CFR 63.2;
- Elimination of the 2-day notification requirement;
- Replacement of the 45-day affirmative defense reporting requirement as follows: "This affirmative defense report shall be included in the first periodic compliance, deviation report or excess emission report otherwise required after the initial occurrence of the violation of the relevant standard (which may be the end of any applicable averaging period). If such compliance, deviation report or excess emission report is due less than 45 days after the initial occurrence of the violation, the affirmative defense report may be included in the second compliance, deviation report or excess emission report due after the initial occurrence of the violation of the relevant standard."; and
- Elimination of the 30-day extension for submitting a written affirmative defense report.

5.2 Startup and Shutdown

85. Comment: Commenters 0162 and 0172 argued that EPA must fully justify applying the same emission limitations during startup and shutdown as during normal operations. The commenters noted that, in the preamble to the proposed rule, EPA did not say that it was precluded from adopting different emission limitations that would apply during startup and shutdown periods. According to the commenter, EPA instead stated that "[n]othing in the record suggests that the operations (and attendant emissions) are significantly different during startup or

shutdown than during normal operations. Periods of startup, normal operations and shutdown are all predictable and routine aspects of a source's operations" (76 FR 81346).

According to commenter 0162, this falls far short of the "reasoned analysis" that an agency must supply before changing a prior decision. See, *e.g.*, *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 42 (1983) ("an agency changing its course by repealing a rule is obligated to supply a reasoned analysis for the change"); *Williams Gas Processing-Gulf Coast Co. v. FERC*, 475 F.3d 319, 326 (D.C. Cir. 2006) ("it is axiomatic that agency action must either be consistent with prior action or offer a reasoned basis for its departure from precedent") (internal quotation marks and brackets omitted). The commenter noted that EPA, in promulgating the existing subpart S regulations, specifically considered the need for special provisions to address higher emissions occurring during startup and shutdown as reflected in EPA's decision to include startup and shutdown periods in the excess emission provision for condensate treatment but not for LVHC and HVLC NCG controls (63 FR 18529-30). According to the commenter, if EPA wishes to change its prior determinations with respect to startup and shutdown provisions, it would have to explain how it erred in arriving at those prior determinations, or how available information has changed since that time. Commenter 0162 argued that the cursory treatment of this issue in the preamble to the proposed rule is not sufficient justification for reversing EPA's prior determinations with respect to startups and shutdowns. The commenter indicated that there is no indication that EPA has analyzed sufficient data on emissions during startup and shutdown to justify its conclusion, as opposed to merely assuming it is correct. According to the commenter, EPA cannot conclude that special provisions for emissions during startup and shutdown are not needed based on "mere speculation." See *NRDC v. EPA*, 859 F.2d 156, 210 (D.C. Cir. 1988). The commenter argued that the default assumption must be that they are needed. The commenter noted that EPA, in establishing the existing subpart S standards, previously determined that the best performers on which the MACT standards were based may not achieve those standards during startup and shutdown. The commenter asserted that EPA cannot simply change its mind about this sort of assessment without providing a factual analysis supporting EPA's new conclusion that MACT standards can be achieved during all startup and shutdown periods as well. See, *e.g.*, *Transactive Corp. v. United States*, 91 F.3d 232, 237 (D.C. Cir. 1996). The commenter doubted that emissions data representative of startup and shutdown events exist that would be sufficient for EPA to conduct a reasoned analysis to demonstrate the achievability of the MACT emission limits established for normal operations during startup and shutdown events (contrary to EPA's prior rulemaking), because of likely limitations in the available data.

According to commenter 0162, there are several reasons why adequate data often do not exist to allow EPA to conclude that an emission limitation established for normal operations also represents the performance of the best demonstrated control technology during startups and shutdowns. First, to the extent that emissions data come from required performance tests, the commenter noted that applicable regulations generally prohibit testing during SSM conditions, and require that data not be used for compliance purposes if obtained during a startup, shutdown, or malfunction event.[139] Second, to the extent that EPA evaluates emissions data collected

[139] Commenter 0162 cited as an example the NESHAP GP, specifically the statement that performance tests can only be conducted under representative conditions and which specify that: "Operations during periods of startup,

through continuous monitoring, the commenter noted that applicable regulations often require or allow the source to exclude from its reporting of continuous monitoring data those data reflecting SSM conditions. Finally, the commenter noted that atypical pollutant concentrations and other stack conditions that may exist during startup and shutdown can result in the continuous monitoring system producing unusable data because the pollutant concentration may be outside of the monitoring equipment's span or the stack conditions may not meet monitoring system quality assurance/quality control (QA/QC) parameters, or the data may be truncated on the high end because of limitations of the monitoring equipment.[140]

Commenter 0162 concluded these factors would cause EPA to understate emissions occurring during startup and shutdown. The commenter also cited an additional problem—that it can be unclear whether a condition that leads to excess emissions should be characterized as a startup or shutdown event or a malfunction event. According to the commenter, without a clear demarcation (both in EPA regulations and in practice), EPA could be analyzing data sets that exclude events that were treated as malfunctions, but that EPA would say should be included in calculating average performance as startup or shutdown conditions.

According to commenter 0162, while EPA may not be able to calculate average HAP emissions during startup and shutdown periods, EPA certainly has available to it information that indicates that pulp and paper mills using the MACT "floor" technologies and complying with the subpart S standards during normal operations would not be able to comply during at least some startup and shutdown conditions. As an example, the commenter cited the requirement in §63.443(c) that emissions from specific processes be vented into a closed-vent system and routed to a control device. According to the commenter, because these gases can be explosive, they cannot be routed to an incineration device unless the concentration and volume of the vent gas and the conditions in the incineration device meet certain conditions necessary to prevent explosions ("permissives"). The commenter noted that when pulping processes are starting up or shutting down, the NCGs generated by the process may not meet permissives for a period of time, and the NCGs will have to be vented for safety reasons due to the increased variations in the process during starting up and shutting down. The commenter indicated that same thing is true of startup or shutdown of a primary or backup incineration device (which may be a boiler, recovery furnace, lime kiln, or other combustion unit that is also part of the pulp mill operation), during which the conditions in the incineration device may not meet permissives for a period of time, and it will be necessary to bypass the NCGs around that device to avoid explosion. As another example, the commenter cited the requirements in §63.453 to monitor operating parameters in lieu of, or in addition to, monitoring emissions. According to the commenter, operating parameters established to represent proper operation during normal operating conditions will often be different from the operating parameters that apply when a unit is being started up or shut down.

Similarly, commenter 0172 stated that in the preamble to the proposed rule, EPA asserted that startup and shutdown operations are as routine and predictable as normal operations and can be controlled, so that emissions are the same as during routine operations. The Agency also

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shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test…." 40 CFR 63.7(e)(1); see also 40 CFR 60.8(c) (same for performance testing for NSPS).

[140] Commenter 0162 noted that data from periods when the monitoring system is outside of control limits are required to be excluded from emission averages under the NESHAPs General Provisions. See 40 CFR 63.8(c)(7)(ii).

believes that as long as control devices are started up before the process and shut down after the process is down, emissions can be controlled to the same degree as during "normal" operations. Commenter 0172 stated that EPA's assertions do not reflect the reality of operations in heavy industrial processes, such as pulp and paper making. During startups and shutdowns, abnormal emissions may and frequently do occur because, by definition, the process equipment is not in a stable mode–it is being started up or shut down. Process flows, temperatures and pressures are constantly changing during the startup and shutdown process, resulting in unexpected diversions from the planned startup or shutdown procedures. These unexpected diversions can lead to emissions that are higher than those when the process is in routine operation.

Commenter 0172 noted that, even if there is a control device which has been energized and is operating normally, it may be physically located at the end of a long piping system collecting emissions from more than one piece of process equipment (such as an incinerator collecting vent gases from an LVHC system regulated under subpart S). During the unstable operating conditions that occur during startup or shutdown, it may be necessary to vent gases directly from a process unit (such as to compensate for unexpected over-pressurization) to prevent damage to the process equipment.

According to another commenter (0163), EPA's conclusion that startup and shutdown periods are "predictable and routine aspects" of normal operations fails to recognize that, while timing and process steps may be foreseeable, the specific circumstances with many of these events may be unique. The commenter contended that EPA cannot include these events under the current or proposed subpart S emissions standards because they were not necessarily considered part of the original MACT floor emission evaluation. Instead, the commenter recommended that EPA consider its decision in the March 2011 final Boiler MACT rules to set work practices for startup and shutdown events, which reversed their 2010 proposed rule assumption that emission limits set for normal operating periods reflected and could legally apply as well during these events.

In addition, commenter 0164 stated that EPA does not appear to have performed a scientific analysis that would justify reversing that determination for startup and shutdown events, and, for malfunction events, EPA acknowledges that even well-designed and well-operated mills will exceed the standards.

Response: As explained earlier, we do not claim that the *Sierra Club* decision constrains our authority to prescribe unique standards during SSM periods. But there must be a basis for our determination to prescribe standards other than MACT emission limits during those events. The EPA, under CAA section 112(h) authority can also, in cases where it is not feasible to prescribe or enforce an emission standard, promulgate a design, equipment, work practice, or operational standard (or combination thereof). The phrase "not feasible to prescribe or enforce an emission standard" is defined narrowly in section 112(h)(2) to mean "any situation in which the Administrator determines that: (A) a hazardous air pollutant or pollutants cannot be emitted through a conveyance designed and constructed to emit or capture such pollutant, or that any requirement for, or use of, such a conveyance would be inconsistent with any Federal, State or local law, or (B) the application of measurement methodology to a particular class of sources is not practicable due to technological ***and*** economic limitations."(emphasis added)

The EPA's adoption of work practice standards for startup and shutdown periods in other rules does not mean it is appropriate to do so for pulp and paper processing equipment. Consideration of separate standards is source-category specific.

Although the commenters suggest that different standards should be adopted for startup and shutdown periods (*i.e.*, other than the standards that apply during normal operation), the commenters have not provided specific information to indicate that compliance with normal operating standards during startup and shutdown is not practicable, why separate standards are justified, or to explain specifically how sources subject to the normal operational standards in subpart S would be unable to comply during startup or shutdown (other than for periods covered by the excess emissions allowances for NCG systems). The commenters also do not suggest any specific standards that could apply during startup and shutdown for the universe of pulp and paper processes regulated under subpart S (which offers a variety of compliance options).

Commenters repeatedly point to NCG collection system venting as an example of why EPA should have special provisions for startup and shutdown events. Commenters also have indicated that the excess emissions allowances are used during normal operational time periods and that these periods of excess emissions should not be considered malfunctions. Under the subpart S amendments being promulgated, the same standards apply for normal operation, startup, and shutdown, so there is no reason to distinguish between normal operation, startup, and shutdown in determining circumstances in which excess emissions allowance provisions can apply. (Only malfunction will be handled separately through availability of the affirmative defense provisions.) The EPA views the amendments to remove the SSM exemption (through corrections to GP references) as a separate issue from the excess emissions allowances. As noted in section 6 of this document, we received additional information from the industry to aid in our investigation of the excess emissions allowances and are deferring action on these allowances to a later date.

The EPA proposed (and is finalizing in the subpart S amendments) removal of the parenthetical references to SSM from the excess emissions allowance language in subpart S. For the 1 percent LVHC and 4 percent HVLC allowances, the parenthetical language in §63.443(e) that allowed the SSM exemption in addition to the venting allowances has been removed from subpart S. The parenthetical language in §63.446(g) clarifying that the 10 percent steam stripper venting allowance included periods of SSM has also been removed. This parenthetical language was originally included in the rule because EPA had no information to "differentiate SSM emissions from normal stripper operating emissions" when originally reviewing the data that formed the basis for the 10 percent steam stripper venting allowance. (63 FR 18530, April 15, 1998) Thus, the commenter's assertion is incorrect that EPA "specifically considered the need for special provisions *to address higher emissions occurring during startup and shutdown* as reflected in EPA's decision to include startup and shutdown periods in the excess emission provision for condensate treatment but not for LVHC and HVLC NCG controls" (emphasis added).

We have assembled information from the 2011 pulp and paper ICR pertaining to equipment, control, and compliance demonstration methods in order to address the commenters' concerns that EPA's conclusion that separate standards are not needed for periods of startup and shutdown is not supported and based on "mere speculation." The ICR contained questions

designed to provide EPA with an understanding of the duration, emissions potential, work practices, and control mechanisms of startup and shutdown events for the wide variety of equipment used at pulp and paper mills. This information is summarized below and detailed in a separate memorandum in the docket.[141]

For emission unit startup and shutdown, the survey asked:

- Approximate duration of emission unit startup and shutdown (hours). [2 questions]
- Measures employed to reduce air emissions during emission unit startup and shutdown (if any). [2 questions]
- What marks the end of emission unit startup and beginning of normal operating conditions?
- What marks the end of normal operating conditions and beginning of emission unit shutdown?
- An optional suggestion for a standard that would apply during startup or shutdown of this emission unit.

For control device startup and shutdown, the survey asked:

- Approximate duration of control device startup and shutdown (hours). [2 questions]
- Explain how control device startup and shutdown is integrated with (dependent upon) emission unit startup and shutdown. [2 questions]
- List any control device continuous emissions monitoring or operating parameter limits that cannot be met during control device startup or shutdown. [2 questions]
- Measures employed to reduce air emissions during control device startup and shutdown (if any). [2 questions]
- What marks the end of control device startup and beginning of normal operating conditions?
- What marks the end of normal operating conditions and beginning of control device shutdown?

The ICR also contained optional questions, where respondents were asked to suggest a separate standard that could apply during emission unit and control device startup or shutdown. No useful suggestions for separate standards were received.

Responses to survey questions asking what marks the beginning and end of normal operations for emission units and control devices were very site-specific in nature. This stands to reason because mills formerly defined startup and shutdown—in consideration of their specific equipment and operational practices—in their SSM plans. The only conclusion we could draw from the responses to these questions is that defining the beginning and end of startup and shutdown periods in a way that makes sense for all mills in the nation would be very difficult, if not impossible. However, it would have been necessary for EPA to define the beginning and end of startup and shutdown if EPA were to adopt separate standards to apply during these periods (i.e., so it would be clear which standard is applicable at any given time).

Subpart S contains standards for:

[141] See memorandum by K. Hanks, RTI, to J. Bradfield and B. Schrock, EPA, titled *Review of Pulp and Paper Information Collection Request (ICR) Responses Pertaining to Startup and Shutdown of Subpart S Equipment*, June 29, 2012, in the docket for the subpart S rulemaking.

- Kraft, soda, and semichemical pulping vent gases (§63.443);
- Sulfite pulping vent gases (§63.444);
- Bleaching vent gases (§63.445);
- Closed-vent systems used to transport pulping or bleaching vent gases (§63.450); and
- Kraft pulping condensates (including closed collection systems for kraft condensates) (§63.446).

Some mills are complying with selected subpart S standards through use of the CCA or other site-specific options (*e.g.*, equivalency-by-permit). At many mills, the technologies used for site-specific compliance options are the same as those used to comply with the standards noted above (*e.g.*, through controlling more condensates or equipment than are required to be controlled). Therefore, we expect consideration of the equipment and standards listed above (and described in detail below) provides sufficient consideration for site-specific compliance options. While we cannot purport to having considered every single aspect of every U.S. mill's equipment and operations, including review of information requested by EPA and provided by industry, no available data demonstrate the need for separate startup and shutdown standards. Site-specific compliance approaches were set through site-specific reviews by permitting authorities and may need to be revisited should our conclusions relative to startup and shutdown for the majority of equipment not address a site-specific situation.

Kraft, Soda, and Semichemical Pulping Vent Gases. We expect mills will remain in compliance with the kraft, soda, and semichemical pulping vent gas emission standards during emission unit or control device startup and shutdown, and we have concluded that separate standards for startup and shutdown are not necessary for pulping vent gases for several reasons. First and foremost, the survey data indicate that mills usually begin operation of their incineration control device prior to emission unit startup and continue operating their incineration control device until emission unit shut down has occurred. Mills implementing this practice can meet the required design standards and parameter monitoring requirements during emission unit startup and shutdown. Incineration control devices include boilers, lime kilns, recovery furnaces, or thermal oxidizers.

Second, control device startup and shutdown are often addressed at pulp and paper mills through the use of backup controls. Boilers typically start up before most other emissions units because boilers provide steam and power needed to operate emissions units. Similarly, recovery furnaces often provide steam and power for emission units. Although some incineration devices may need to follow a startup sequence (*e.g.*, a recovery furnace that does not begin normal operation until spent liquor is available from digesters; or a lime kiln that does not begin normal operation prior to smelt being generated from the recovery furnace and moving through the causticizing process), we note that these devices can begin to start up on auxiliary fuels prior to processing of spent liquor (for a recovery furnace) or calcium carbonate (for a lime kiln). Many mills also have stand-alone thermal oxidizers that are used as back0up controls when process units such as lime kilns or recovery furnaces are used as the control device.

Third, there are five separate compliance options for pulping vent gases. The two most commonly used compliance options are based on equipment design[142] and do not involve any

[142] The design-based compliance options require mills to:

emissions or parameter monitoring that would show mills to be out of compliance. As long as emissions are collected in the closed-vent system and routed to these operational controls, then mills would be in compliance with the standards. The remaining compliance options involve firebox temperature monitoring or optional use of methanol continuous emissions monitoring systems (CEMS). The survey data reveal than no mills are using methanol CEMS. If an incineration control device is operational prior to emission unit startup and until emission unit shutdown is complete then there is no reason for a temperature parameter limit to be exceeded during emission unit startup or shutdown. Although the firebox temperature parameter may be out of compliance during incineration control device startup or shutdown (*e.g.*, as the incineration device warms or cools), we have concluded, based on the survey results, that this circumstance is being mitigated though use of backup controls or by not starting the emission unit until the control device combustion temperature has been reached at most mills. An emergency startup or shutdown (*e.g.*, when a "hot" backup thermal oxidizer may not be available, and the boiler or lime kiln is not an option), which resulted in a violation of a standard, could arguably be considered a malfunction, and the affirmative defense provisions could be available in this instance.

Overall, we contend that the availability of multiple compliance options (of which the most frequently used are based on equipment design) and widespread use of backup incineration controls makes it possible for mills to comply with the pulping vent gas standards during startup and shutdown. Therefore, separate standards during startup and shutdown were not developed for kraft, soda, and semichemcal pulping vent gases.

We acknowledge that every mill may not have backup controls available for NCG systems (*e.g.*, HVLC systems), either because they have not installed closed-vent collection ductwork to transfer vent gases to a backup incineration device or because a backup incineration device is not available. The need for separate startup or shutdown standards at these mills can be, and most likely is, mitigated through use of compliance options that are based on equipment design.

Sulfite Pulping Vent Gases. Based upon the ICR results, six sulfite mills remain in operation in the U.S., including:

- Three ammonia-based sulfite mills;
- Two calcium-based sulfite mills; and
- One sodium-based sulfite process collocated at a kraft mill.

These mills operate absorbers (scrubbers) for control of pulping vent gases and are required by subpart S to demonstrate continuous compliance through continuous parameter monitoring of effluent pH (or oxidation/reduction potential), inlet vent gas flow rate, and scrubber liquid influent flow rate. The scrubbers used at sulfite mills employ a type of fresh water (*e.g.*, river water, well water) with caustic addition. Flow of fresh water to the scrubber

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- Use a boiler, lime kiln, or recovery furnace in which the HAP gas stream is introduced with the primary fuel into the flame zone; or
- Use a boiler or recovery furnace with a heat input capacity ≥150 MMBtu/hr (44 MW) in which the HAP gas stream is introduced with the combustion air.

(scrubber liquid influent rate) is not dependent on other pulping emission units within the mill (nor is caustic addition since the caustic is not coming from any pulping by-product).

Survey data reveal that scrubbers are started up and meeting required operating parameter limits before the emission unit is started up; and that the scrubbers remain in operation until the emission unit is shut down. No issues with meeting subpart S operating parameters were identified in the ICR responses. Therefore, we have concluded that separate standards for startup and shutdown are not necessary for sulfite pulping vent gases.

Bleaching Vent Gases. Bleach plants typically use caustic scrubbers to reduce HAP emissions. Process waters such as white liquor, weak wash, or caustic are commonly used and recycled within bleach plant scrubbers. Scrubber blow down - the fraction of scrubber liquid that is purged from the system and replaced by new liquid - is either recycled in the process (*e.g.*, within the bleaching or ClO_2 process) or sent to the wastewater treatment system. The ability of bleach plant scrubbers to recycle scrubbing liquid within the scrubber system serves as a buffer to reduce dependency of the scrubber system on other mill processes during brief periods of scrubber startup or shutdown. Startup and shutdown times reported in the ICR responses for bleach plant scrubbers were around half an hour (30 minutes).

An initial performance test is required for bleach plant scrubbers. In addition to the 5-year repeat performance test required with the current amendments to subpart S, continuous compliance for bleaching scrubbers is demonstrated by continuous parameter monitoring of effluent pH (or oxidation/reduction potential [ORP]), inlet gas flow rate, and scrubber liquid influent flow rate. Continuous monitoring of Cl_2 concentration is allowed as an alternative to continuous parameter monitoring; however, no mills reported use of Cl_2 CEMS in the survey responses. Several mills reported use of ORP instead of pH. Fan motor amps, revolutions per minute (rpm), or fan on/off status are often monitored as indicators of inlet gas flow rate. The survey data revealed few issues where parameter limits are not met during bleaching scrubber startup and shutdown. Therefore, we have concluded that separate standards for startup and shutdown periods are not warranted for bleach plant scrubbers.

Closed-Vent Systems Used to Transport Pulping or Bleaching Vent Gases. The subpart S standards for closed-vent gas collection systems contain requirements for:

- Enclosures, openings, and hoods;
- Components operated at positive pressure; and
- Bypass lines that could divert vent streams containing HAPs to the atmosphere.

Mills must maintain negative pressure at enclosures, openings, and hoods. If the enclosure, opening, or hood is closed during the initial performance test, it must remain closed during operation, except for sampling, inspection, maintenance, or repairs. Compliance with these requirements is demonstrated by following a site-specific inspection plan required in §63.454(b), where visual inspections of enclosure openings are required every 30 days per §63.453(k)(1). We have concluded, based upon information available, no circumstances where enclosures, openings, and hoods would not remain closed or maintain negative pressure during startup or shutdown.

Mills are required to operate with no detectable leaks (less than 500 parts per million by volume [ppmv] of volatile organic compounds [VOC] above background) for collection system components operated at positive pressure. Compliance is measured with initial and annual part 60, Method 21 leak detection tests. Even if leak detection tests were conducted during startup and shutdown, it is not expected that startup and shutdown would change the potential for leaks beyond the potential that exists during normal operation, because gas flow volumes are likely to be lower during startup and shutdown.

Bypass lines that could divert vent streams containing HAPs to the atmosphere are required to either:

- Operate a computer-controlled flow indicator to monitor for presence of gas stream flow in the bypass line at least once every 15 minutes; or
- Maintain bypass line valves that are not computer controlled in the closed position, sealed so that the valve or closure mechanism cannot be opened without breaking the seal.

Compliance with these requirements is demonstrated by following the site-specific inspection plan required in §63.454(b), where visual inspections of enclosure openings are required every 30 days per §63.453(k)(1). Bypass line valves that are sealed during normal operation should stay sealed during startup and shutdown (unless a seal is broken due to a malfunction event for which affirmative defense is available). There is no reason to expect a different standard is needed during startup and shutdown for closed, sealed bypass line valves.

Separate standards for startup and shutdown of closed-vent gas collection systems were not explored further since overall few mills indicated problems with meeting the vent gas collection requirements during start and shutdown in their ICR responses. As noted above, EPA was provided additional information from industry that could be relevant to computer-controlled bypass lines on closed vent gas collection systems and the standards for excess emissions allowances. That information can be evaluated further when EPA takes action on the excess emissions allowances.

Kraft Pulping Condensates (Including Closed Collection Systems for Kraft Condensates). Kraft pulping condensates are HAP-containing liquids that are condensed from pulping system vent streams, including condensates from digesters, turpentine recovery, evaporators, LVHC systems, and HVLC systems. The LVHC and HVLC collection system condensates are generated by condensation of moisture in the closed-vent collection systems that convey the LVHC and HVLC system vent gases to a control device.

The subpart S kraft pulping condensate standards include standards for condensate collection and standards for condensate treatment. The kraft condensate collection standards include three options:

- Collect all named condensate streams.
- Collect all LVHC and HVLC streams plus streams that contain 65 percent of the total HAP mass from the digester system, turpentine recovery system, and evaporator system feed stages.

- Collect any subset of the named streams that contain in total 7.2 lb of HAP per ODTP at mills that do not perform bleaching, or 11.1 lb HAP per ODTP at mills that perform bleaching.

Kraft condensates are to be conveyed in a closed collection system that meets the requirements in §63.446(d) of subpart S for individual drain systems and condensate tanks. A mill can meet the closed collection system requirements in two ways:

- Hardpiping; or
- Use existing drains, but cover all openings and route all open vents through a closed-vent collection system to a control device meeting the subpart S NESHAP requirements for pulping system vents.

Closed collection systems used to transport pulping process condensates containing HAPs must meet all of the individual drain system requirements specified in §§63.960, 63.961, and 63.962 of 40 CFR part 63, subpart RR (National Emission Standards for Individual Drain Systems), except that any air vents in the collection system must comply with the kraft pulping vent gas collection and HAP reduction standards in §63.443 (c) and (d) of subpart S. Subpart RR establishes design, operating, inspection, and monitoring requirement standards for controlling air emissions from individual drain systems. The standards control emissions from individual drain systems using covers or seals, or hard-piping. Subpart RR also requires inspections of water seals and closure devices for defects or damage initially and establishes repair requirements for individual drain systems. The closed collection system must be visually inspected every 30 days according to §63.964 of subpart RR.

For condensate tanks, §63.446(d)(2) specifies:

- The fixed roof and all openings (*e.g.*, access hatches, sampling ports, gauge wells) shall be designed and operated with no detectable leaks as indicated by an instrument reading of less than 500 ppm above background, and vented into a closed-vent system that meets the requirements in §63.450 and routed to a control device that meets the requirements in §63.443(d); and
- Each opening shall be maintained in a closed, sealed position (*e.g.*, covered by a lid that is gasketed and latched) at all times that the tank contains pulping process condensates or any HAP removed from a pulping process condensate stream, except when it is necessary to use the opening for sampling, removal, or for equipment inspection, maintenance, or repair.

Compliance with the standards for the different components of closed condensate collection systems is based on system design (*e.g.*, covers, seals, or hard-piping), and continuous compliance is based on periodic leak checks and inspections. Openings in the condensate liquid collection system that are sealed during normal operation should also be sealed during system startup and shutdown (expect, perhaps, for a malfunction or operator error). Based on the information in the record, we have identified no reason why periods of startup and shutdown would result in violation of the periodic leak check and inspection requirements. Consequently, we are not aware of any reasons why separate standards for closed condensate collection systems would be needed for startup and shutdown periods.

Once collected, kraft pulping condensates must be treated according to one of the following subpart S treatment standards:

- Recycling: Route condensates through a closed vent collection systems to pulping equipment controlled by the Subpart S kraft pulping vent gas standards; or
- Route the condensates to biological treatment, steam stripper or other control device that meets one of the following equivalent requirements:
    - Reduce total HAP by at least 92 weight-percent; or
    - For mills without bleaching, either remove at least 6.6 lb total HAP/ODTP, or meet 210 ppmw total HAP at the control device outlet; or
    - For mills with bleaching, either remove at least 10.2 lb total HAP/ODTP, or meet 330 ppmw total HAP at the control device outlet.

For the condensate recycling treatment option, the compliance demonstration would consist only of verifying that no leaks were present in the condensate closed collection system, and confirming closed vent gas system and control device requirements are met. We discussed the kraft pulping vent gas standards above, and concluded that separate standards for startup and shutdown are not warranted for kraft pulping vent gases. As also noted above, we are not aware of any reasons why separate standards for closed condensate collection systems would be needed for startup and shutdown periods. Thus, it follows that separate startup and shutdown standards would not be needed for control of condensates through recycling to pulping equipment subject to the pulping vent gas standards.

Mills controlling kraft condensates with steam strippers or other equipment serving the same function (*e.g.*, an in-process anaerobic biotreatment unit, wastewater thermal oxidizer, *etc.*) must perform an initial performance test for total HAP (measured as methanol) using 40 CFR part 63 Method 305 or NCASI method DI/MEOH-94.03. Inlet and outlet testing is required for mills complying with the percent reduction or lb/ODTP collection and removal standards. Only outlet testing is required for mills complying with the ppmw condensate standards. Alternatively, measure the steam stripper methanol outlet concentration (ppmw). The ICR results reveal that only one mill is using the ppmw option (a mill with a thermal oxidizer), and this mill is not using a methanol CEMS to demonstrate compliance. Mills operating equipment other than steam strippers must petition the Administrator for approval of site-specific monitoring requirements.

For mills using steam strippers, subpart S requires that ongoing compliance be demonstrated by continuous parametric monitoring of the process wastewater feed rate, steam feed rate and process wastewater column feed temperature. Although not specified explicitly in subpart S, the steam feed rate and condensate feed temperature parameter limits are minimum limits that relate to how much heat must be applied in the steam stripper system in order to strip organics into the vapor phase. The steam-to-feed ratio (SFR) is the stripper operating parameter with the greatest effect on stripper performance. This ratio is monitored through subpart S by dividing the monitored steam feed rate by the process wastewater feed rate. A larger SFR would result in more organics being stripped from the wastewater. Steam feed rate is typically automatically controlled in conjunction with wastewater feed rate to ensure a minimum SFR is maintained.

The ICR responses were reviewed to determine if mills reported issues with maintaining compliance with the parametric monitoring requirements during startup and shutdown. Mills generally indicated that stripper operation would begin after the pulping vent gas collection and control system is ready to accept stripper off gases, and after pulping processes have operated long enough for condensates to be generated for input into the steam stripper. Some mills noted that condensates may be sent to biotreatment for backup until the stripper is fully operational, that stripper operation does not begin until a sufficient level of condensates has been collected in the condensate tank, or that condensates must reach a specified temperature before they are sent to the stripper. Adequate condensate tank capacity serves as a buffer between the pulping process and steam stripper (*e.g.*, allowing collection of condensates for a short time while the stripper is offline or in startup/shutdown mode). Using the maximum of any ranges provided by respondents (*e.g.*, for cold startup), the median startup and shutdown times for condensate strippers provided in the ICR responses (Equip detail tab) was 1 hour, with an average of 2 to 3 hours. No specific issues indicating the inability of mills to meet the stripper operating parameter limits during startup or shutdown were observed in the ICR responses. Therefore, we conclude that separate standards during startup and shutdown periods for kraft condensates controlled by steam strippers are not necessary.

Mills using biological wastewater treatment to control kraft condensates must perform an initial test followed by quarterly sampling to determine the fraction of methanol biodegraded. The testing requirements differ somewhat for biotreatment systems that are thoroughly mixed versus non-thoroughly mixed, but the continuous parameter monitoring requirements are the same. Subpart S requires that mills monitor daily the outlet soluble 5-day biochemical oxygen demand (BOD_5) concentration, mixed liquor volatile suspended solids (MLVSS), horsepower of aerator units, inlet liquid flow, and liquid temperature. In addition, mills must obtain daily inlet and outlet liquid grab samples from each biological treatment unit to have HAP data available to perform quarterly performance tests and to store until after the BOD_5 results are obtained. Alternatively, mills can conduct daily monitoring of the site-specific parameters approved by the Administrator. Biological wastewater treatment systems (*e.g.*, ASBs or AST units) differ from in-process condensate treatment technologies (*e.g.*, steam strippers or in-process biotreatment units dedicated to condensate control), because these wastewater treatment systems typically accept wastewaters from all over the mill and must be up and running at all times to comply with National Pollutant Discharge Elimination System (NPDES) requirements under the CWA. Therefore, we concluded that special standards that would only apply during startup and shutdown are not relevant for mill wastewater treatment systems that treat condensates but also accept process waters from all over the mill. Mill-wide biological wastewater treatment systems were similarly distinguished from in-process condensate controls in our clarification that the 10 percent excess emissions allowance does not apply for these systems. (63 FR 49457, September 16, 1998)

Summary. To summarize, we have reviewed the information available to us regarding startup and shutdown periods. As detailed above, available information does not show that emissions are higher during startup or shutdown nor does available information indicate a need for an alternate standard for these periods. Further, the commenters have not shown that sources cannot comply with the standards as proposed and have not provided information to support development of alternative standards that would apply during startup and shutdown periods.

Thus, we have concluded that the standards that apply during normal operation will also apply during startup and shutdown.

5.3 Malfunction and Affirmative Defense

86. Comment: Commenters 0162 and 0172 argued that EPA is required to take malfunctions into account when adopting emission standards. Commenter 0162 stated that EPA offered very little support for its assertion that its approach to malfunctions in setting emissions standards "is consistent with CAA section 112 and is a reasonable interpretation of the statute" (76 FR 81347), other than stating its own, often counterintuitive, conclusions. As an example, commenter 0162 indicated that EPA made little effort to justify its assertion "that CAA section 112 does not require that emissions that occur during periods of malfunction be factored into development of CAA section 112 standards" (76 FR 81346). Commenter 0162 also said that EPA had it backward when it said that "[t]here is nothing in CAA section 112 that directs the Agency to consider malfunctions in determining the level 'achieved' by the best-performing or best controlled sources when setting emission standards" (76 FR 81326). According to commenter 0162, there is nothing in CAA section 112 that allows EPA to ignore malfunctions and set MACT standards based on a level of emissions that even best-performing sources only achieve part of the time.

Commenter 0162 argued that EPA also offered a backwards, results-driven rationale for ignoring malfunctions, that "accounting for malfunctions could lead to standards that are significantly less stringent than levels that are achieved by a well-performing non-malfunctioning source" (76 FR 81347). The commenter stated that this rationale directly contravenes congressional intent that MACT "floor" standards be based on what the best sources actually achieve. According to the commenter, EPA cannot ignore the requirement that MACT "floor" standards reflect performance actually achieved, just because EPA would like the standards to be more stringent than that actual performance reflects.

According to commenter 0162, EPA acknowledges that even properly designed and operated equipment will sometimes exceed emission limitations that were based on steady-state operation, due to malfunctions (76 FR 81347). The commenter noted that even the best-performing units in the source category covered by the proposed rule (like any technologies) are subject to a wide variety of potential malfunctions (*e.g.*, power failures, equipment breakdowns) (76 FR 81346). The commenter explained that operators of these processes and equipment must treat malfunctions as very distinct events from steady-state operations, depending on the severity of the malfunction, requiring anything from shutdown of the unit to emergency fire response actions. The commenter agreed with EPA's conclusion that the factual complexity of differing processes and of the severity, frequency, and duration of malfunctions makes standard-setting difficult (76 FR 81346). The commenter added that it is often infeasible to gather emissions data during malfunctions–either for standard-setting or for compliance-demonstration purposes—because malfunctions are by definition unexpected and infrequent, so it is not possible to plan to have test equipment in place to measure emissions when one occurs. According to the commenter, even if test or monitoring equipment is in place, emissions during malfunctions

often are not routed to a stack where they can be measured, and upsets during stack testing invalidate the test results under EPA's approved test methods.[143]

The commenter argued that these findings should lead EPA to prescribe alternative design, equipment, work practice or operational standards where it is not feasible to set or enforce a numerical emission limit, based on its authority under CAA section 112(h), rather than support EPA's decision to ignore the fact that SSM events can lead to higher emissions even at well-operated facilities with the best control equipment. According to the commenter, EPA cannot rationally defend its articulated view that applying the concept of "best performing" is inconsistent with a source experiencing a malfunction (76 FR 81346) because it ignores that there are work practices (*e.g.*, monitoring operating parameters to identify a malfunction and stopping or cutting back the process accordingly) that represent the best practices for minimizing emissions during a malfunction. The commenter pointed out that, while the measures that represent these best practices will depend on facility-specific issues, such as process design, pollution control train, and other factors, they nonetheless represent "the maximum degree of reduction in emissions of the hazardous air pollutants...achievable...through application of measures, processes, methods, systems or techniques" and reflect "the emission control that is achieved in practice by the best controlled similar source[s]" CAA section 112(d)(2) and (3).

Commenter 0163 agreed that the CAA does not require EPA to include the emissions from malfunction events in the limitations it sets for normal operating periods, since those emissions typically cannot reasonably be measured or monitored, but those emissions also are not amenable to regulation under specific emission limits. A single emission limitation that applies even though it cannot be met during malfunction (or startup or shutdown) events does not represent a limitation "achieved in practice," as required by CAA section 112(d)(3). The original subpart S MACT standards for pulping sources were written with the understanding that excess emissions associated with SSM events would not be considered violations of the standards, either because of specific provisions of the regulations or because of the now vacated exemption in the NESHAP GP. Because of the court decision and the underlying CAA achievability criteria, the commenter believes EPA must focus its reassessment of malfunction standards applicable to the pulping and bleaching processed in a way that captures the fundamental information on best performers on which the current standards were based.

Response: The EPA provided a detailed justification in the preamble to the proposed rule for its approach to malfunctions. As the D.C. Circuit Court noted in *Sierra Club v. EPA*, 167 F. 3d 658 (D.C. Cir. 1999), the phrase "average emissions limitation achieved by the best performing 12 percent of units" in section 112 of the CAA "says nothing about how the performance of the best units is to be calculated." *Id.* at 661. Congress has not directly addressed the issue of whether emissions that occur during periods of malfunction must be taken into account in calculating the performance of the best units, and EPA's approach to malfunctions is reasonable for the reasons set out in the preamble to the proposed rule. For example, EPA explained, and the commenter agrees, that the factual complexity of differing processes and of

[143] Commenter 0162 noted that EPA acknowledged these potential obstacles to measuring emissions during SSM events in the preamble to final emission standards for medical waste incinerators (74 FR 51368, 51394 (Oct. 6, 2009)), which said: "It would be very difficult to do any meaningful testing during such an event because the exhaust flow rates, temperatures, and other stack conditions would be highly variable and could foul up the isokinetic emissions test methods (thus invalidating the testing)."

the severity, frequency, and duration of malfunctions makes standard-setting impracticable. In fact, the commenter's statement that the best work practices employed during malfunctions "will depend on facility-specific issues, such as process design, pollution control train, and other factors" highlights the impracticability of setting work practice standards that apply across all sources in the category for the myriad types of malfunction that could occur. The commenter does not explain how any of the options suggested would make it any easier or practicable for EPA to set a national standard that accounts for the innumerable types of malfunctions that, as commenter points out, might vary depending on facility-specific issues. The EPA further explained that the performance of units that are malfunctioning is not reasonably foreseeable and cited to case law supporting its approach to malfunctions. See *Sierra Club* at 665 (discussing need to take into account the worst reasonably foreseeable performance) and *Weyerhaeuser v. Costle*, 590 F.2d 1011, 1058 (D.C. Cir. 1978) ("In the nature of things, no general limit, individual permit, or even any upset provision can anticipate all upset situations.").

In pointing out that "accounting for malfunctions could lead to standards that are significantly less stringent than levels that are achieved by a well-performing non-malfunctioning source," EPA was merely pointing out one possible consequence of taking malfunctions into account in setting standards if such an approach were practicable. This theoretical consequence is not driving EPA's approach to malfunctions.

For all the reasons explained in the proposal preamble and above, EPA's approach to malfunctions is reasonable and consistent with the statute regardless of whether collection of certain types of malfunction data under certain circumstances is theoretically possible.

87. Comment: Commenter 0162 rejected EPA's claims that it somehow "presents significant difficulties" to attribute malfunctions to a "best performing" source (76 FR 81346), stating that it "presents significant difficulties" when EPA ignores the undisputed existence of malfunctions even at best performing sources, and claims falsely that the best performing sources "achieve" emission levels that they undisputedly do not achieve part of the time. The commenter argued that, since EPA describes malfunctions as being sometimes unavoidable or "not reasonably preventable," despite proper design and maintenance of equipment, there is no basis for EPA's conclusion that malfunction events are not representative of best performing sources (76 FR 81346). While the commenter acknowledged that one goal "of best performing sources is to operate in such a way as to avoid malfunctions of their units" (76 FR 81347), that is all the more reason why EPA must acknowledge the fact that those sources nevertheless experience malfunction events, rather than assume those emissions away.

Commenter 0163 stated that EPA may not be able to establish a reasonable specific emission limitation for these events, but they believe the Agency can establish a reasonable standard, such as appropriate additions to the venting allowances or, where allowance cannot be feasibly determined from the data, work practice standards under CAA section 112(h). The commenter referred EPA to the detailed SSM Coalition comments on the proposed NESHAP modifications for the Mineral Wool and Ferroalloys industries.

Commenter 0162 further argued that EPA was going beyond the MACT "floor" by proposing MACT standards that it recognizes even the best performing existing sources cannot achieve part of the time, but without making the demonstrations that the CAA and case law

require EPA to make in order to impose beyond-the-floor MACT standards. The commenter said that this is especially obvious when one considers the many conditions EPA proposed to impose on sources during malfunctions, in order to be excused from civil penalties through the affirmative defense. According to the commenter, EPA made no attempt to justify those conditions as reasonable, "taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements…." (CAA section 112(d)(2)).

Commenter 0162 also noted that EPA did not provide any support for its belief that "[a]pplying the concept of 'best controlled' or 'best performing' to a unit that is malfunctioning presents significant difficulties" in setting CAA section 112 standards (76 FR 81346). The commenter argued that it is indefensible for EPA to acknowledge that malfunctions are inevitable, even for the best performing sources, refuse to include emissions data representing malfunctions in calculating the MACT "floor" (76 FR 81346), and then require that those MACT "floor" limitations be met even during malfunctions.

Response: The EPA is not setting a beyond-the-floor standard. The EPA's approach to consideration of malfunctions in setting MACT standards is explained in detail in the preamble to proposed (and final) rule(s). As explained in the preamble(s), the EPA has determined that CAA section 112 does not require that emissions that occur during periods of malfunction be factored into development of CAA section 112 standards (*i.e.*, in determining the floor). There is nothing in section 112 that directs the Agency to consider malfunctions in determining the level "achieved" by the best-performing or best-controlled sources when setting emission standards. Moreover, while the EPA accounts for variability in setting emissions standards consistent with the section 112 case law, nothing in that case law requires the Agency to consider malfunctions as part of that analysis.

Moreover, the "conditions EPA proposed to impose on sources during malfunctions" referred to by the commenters are not conditions to show compliance. Rather, the affirmative defense criteria describe when a source in violation of the standard may assert a defense to civil penalties.

The EPA did not conclude in our proposal that "malfunction events are not representative of best performing sources." Rather, the EPA concluded in setting the MACT floor that the performance tests used to set the MACT floor met the requirements of section 112 by representing the emissions from the ''best controlled'' and ''best performing'' units, during tests of performance and during normal operations.

The EPA cannot apply the term of ''best controlled'' or ''best performing'' to an affected source while that affected unit is malfunctioning. This is why source performance tests, the basis for setting appropriate standards, must represent normal operations, per 40 CFR 63.7, which is an applicable requirement under subpart S.

88. Comment: According to commenter 0162, if it is possible to gather sufficient representative data reflecting emissions during malfunctions, then EPA is obligated to consider those data in its MACT "floor" calculations for steady-state operating conditions. The commenter indicated that, to the extent EPA had access to continuous monitoring data for

emission units covered by the NESHAP, EPA could have conducted analyses of emissions levels during malfunction events. The commenter noted that many types of sources are required by many state agencies to submit deviation reports or malfunction reports when they experience a malfunction that causes an exceedance of an applicable limitation and that EPA did not appear to have made any attempt to obtain and analyze such reports, in order to assess what type of requirement might reasonably apply to the subject emission units during malfunctions.

Response: As explained in detail in the preamble to the proposed rule and in responses above, the EPA has determined that CAA section 112 does not require that emissions that occur during periods of malfunction be factored into development of CAA section 112 standards, regardless of whether it might be possible to gather emissions data in certain circumstances for certain types of malfunctions. The EPA also notes that it is not clear that data collected during any particular malfunctions event would be predictive and representative of other types of malfunction events.

89. Comment: Commenters 0162 and 0172 pointed out that there are several options EPA could use for setting MACT standards under CAA section 112 that would apply during malfunction events. As an example, commenter 0162 noted that EPA might be able to establish an emission limitation that applies at all times, but that has an averaging time of sufficient duration that short, infrequent spikes in emissions due to malfunctions would not cause the source to exceed the emission limitation (while at the same time ensuring that the source does not operate in a way that causes frequent, lengthy excursions above the normal controlled emission rate). The commenter further noted that EPA also could use the flexibility accorded by CAA section 302(k)—which defined "emission limitation" and "emission standard" to include "any requirement relating to the operation or maintenance of a source to ensure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under" the CAA—to address emissions during malfunction events through operational requirements rather than by applying the same limits on pollutant concentrations in exhaust gases that apply during normal operations.

Commenters 0162, 0163, and 0172 also noted that EPA also could have concluded, as explained above, that it has grounds to exercise its authority under CAA section 112(h) to promulgate a design, equipment, work practice, or operational standard, or combination thereof, because it is not feasible to prescribe or enforce an emission standard. Commenter 0162 also suggested that EPA could use a combination of these approaches. According to the commenter, there is no indication in the proposed rule that EPA gave much, if any, consideration to these types of options. The commenter argued that there are ample reasons to reject EPA's conclusory assertions that it cannot take malfunctions into account when setting MACT standards for the subject source category. According to the commenter, EPA's failure to evaluate these options thoroughly renders the proposed rule arbitrary and requires EPA to develop a new proposal.

Response: It is not clear how an emissions averaging approach could be developed that would be able to account for the malfunction emissions, given the myriad different types of malfunctions that can occur across all sources in the category and given the difficulties associated with predicting or accounting for the frequency, degree, and duration of various malfunctions that might occur. As to the other suggestions of using a design, equipment, work

practice, or operational standard to control during a malfunction under CAA section 112(h), please see the response to comment no. 86 in this section.

90. Comment: Commenter 0162 argued that the proposed affirmative defense provision is not a substitute for addressing malfunction events in the emission standards themselves. According to the commenter, EPA acknowledges that the sources subject to the proposed rule will sometimes be unable to comply because of malfunctions, even if their equipment is properly designed and maintained, through no fault of the source (76 FR 81347). However, the commenter noted that EPA is offering "affirmative defense," rather than promulgating an emission standard that eliminates that situation, so that the regulated emission sources will be subject to differentiated requirements, achievable with the identified best technology during malfunction events. The commenter stated that the proposed affirmative defense provision shifts the burden to the source to prove that many various criteria are met and actions were taken by the source, in order to avoid "civil penalties." The commenter further stated that these criteria bear no direct relation to the statutory factors for MACT standards under CAA sections 112. According to the commenter, including an affirmative defense provision does not cure EPA's failure to set emission standards that are achievable during SSM events. The commenter contended that the proposed standards, incorporating affirmative defense, still do not represent emission limitations "achieved" by best-performing existing sources under CAA section 112(d)(3), nor do they meet the criteria for establishing beyond-the-floor emission standards under CAA section 112(d)(2).

Commenter 0162 further noted that it is not even clear what the affirmative defense covers. According to the commenter, the proposed rule states that sources may assert an affirmative defense "to a claim for civil penalties for exceedances of such standards that are caused by malfunction, as defined in §63.2."[144] The commenter inquired whether the term "civil penalties," which they said was not defined in the proposed rule, was intended to apply as well to a "civil administrative penalty" imposed by EPA under CAA section 113(d). (The commenter noted that the term "civil penalty" in other contexts means only penalties imposed by a court.) The commenter also inquired whether the affirmative defense applied to "noncompliance penalties" under CAA section 120, which apply, *inter alia*, to noncompliance with a section 112 NESHAP. The commenter stated that, to meet the purported purpose of the affirmative defense, which is to provide relief from emission limitations that cannot be met at times even with equipment that is properly designed and maintained (76 FR 81347), the affirmative defense provision would need to apply to civil and administrative penalties, including noncompliance penalties.[145]

Commenter 0162 noted that it is also unclear how the affirmative defense would apply to enforcement actions by state and local governments, or to private citizen enforcement actions under CAA section 304. The commenter stated that the preamble to the proposed rule, for

[144] See proposed 40 CFR 63.456.

[145] Commenter 0162 noted that, in the preamble to the proposed rule, EPA states that, if a source cannot prove its entitlement to the affirmative defense, "appropriate penalties could be assessed in accordance with section 113 of the CAA (see also 40 CFR 22.27)" (76 FR 81347). The commenter argued that this does not answer the questions stated above. Therefore, the commenter concluded, the proposed rule is unclear on this key issue of what the affirmative defense is intended to cover.

example, only refers to sources applying affirmative defense in an EPA enforcement action.[146] The commenter stated that the affirmative defense provision should clearly state that it is applicable to enforcement actions by states or citizen-suit plaintiffs, as well.

According to commenter 0162, EPA does not give any explanation for why the affirmative defense would not be available for claims for injunctive relief.[147] The commenter argued that if the excess emissions associated with the equipment or process failure are not reasonably preventable, then there is no apparent reason why an affirmative defense to a claim for injunctive relief should not be available, as well. The commenter pointed out that, as a matter of law, injunctive relief may not be available in cases where a civil penalty cannot be imposed. See *Sierra Club v. Otter Tail Power Co.*, 615 F.3d 1008 (8th Cir. 2010) (under concurrent remedy doctrine, injunctive relief for a CAA violation is barred when civil penalty is barred by statute of limitations).

Commenter 0162 further noted that maintaining liability for injunctive relief renders the affirmative defense particularly ineffective with respect to citizen suits. According to the commenter, if the source is even potentially subject to injunctive relief, and, therefore, could be required to pay the citizen-plaintiff's attorneys fees, even if the source successfully demonstrated that it otherwise qualified for the affirmative defense, then the affirmative defense would not accomplish EPA's stated objective of providing relief in situations where the emission limitations cannot be met despite proper design and operation of process and control equipment.

Commenter 0162 contended that EPA has not addressed these and other apparent limitations and shortcomings of the affirmative defense, which make it an entirely inadequate substitute for setting MACT standards that include provisions for SSM events. The commenter also stated that EPA provided no analysis that would supersede its long-standing determination that it is not desirable to rely on enforcement, rather than regulatory language, to address the inability to comply with technology-based standards during SSM events (37 FR 17214, (Aug. 25, 1972)) (establishing SSM provision in NSPS). The commenter noted that courts have adopted the same view. See, *e.g.*, *National Lime Ass'n*, 627 F.2d at 431 n.46 ("the flexibility appropriate to enforcement will not render 'achievable' a standard which cannot be achieved on a regular basis, either for the reasons expressly taken into account in compliance determination regulations (here startup, shutdown and malfunction), or otherwise.").[148]

Commenters 0162 and 0172 also stated that the provision needs to state clearly that a source that qualifies for the affirmative defense shall not be deemed to have violated the applicable standards during that time. Commenter 0162 suggested that EPA specifically reword

[146] See 76 FR 81347 ("In any judicial or administrative proceeding, the Administrator would be able to challenge the assertion of the affirmative defense….") (emphasis added).
[147] See proposed 40 CFR 63.456.
[148] See 37 FR 17214 (Aug. 25, 1972) (establishing SSM provision in NSPS). See also *Marathon Oil Co. v. EPA*, 564 F.2d at 1273 (explaining why EPA's statement—that it would not take enforcement action against sources that exceeded effluent limitations because of upset events—was "not an adequate response" to the argument that standards that cannot be met during unavoidable upsets fail to reflect available technology). Commenter 0162 stated that, for these reasons, EPA's statements in the proposal preamble—that it will "determine an appropriate response" to reported exceedances of the proposed standards, based on whether the exceedances were avoidable, minimized, etc. (which the commenter said seems to be in addition to providing the affirmative defense)—are not in any way a substitute for EPA setting the standards at an achievable level to begin with (76 FR 81347).

the provision to state that a source "will not be deemed in violation of" the MACT standards for excess emissions or other deviations from the standards, associated with a startup, shutdown, or malfunction event, unless the event, and the source's response to the event, do not meet the criteria spelled out in the regulations."[149] If EPA did that, the commenter felt it may be unnecessary to state also that the affirmative defense relieves the source from liability for all types of penalties (civil penalties, civil administrative penalties, noncompliance penalties) and injunctive relief (save criminal penalties) in an action brought by EPA, a state, or a citizen-suit plaintiff. However, the commenter felt that should be the clear effect of qualifying for the affirmative defense. The commenter further suggested that this reconfigured provision be called something other than an "affirmative defense," such as an "alternative standard for SSM events."

Response: The EPA agrees that affirmative defense is not a substitute for using malfunction emissions data in setting standards, because, as explained in detail in the preamble to the proposed rule and in responses above, the EPA has determined that CAA section 112 does not require that emissions that occur during periods of malfunction be factored into development of CAA section 112 standards. The affirmative defense is not a condition for compliance, but rather a set of criteria for a source found to be in violation of a standard, to show that civil penalties are not appropriate in a given instance.

The EPA reminds the commenter that EPA must establish emission standards that "limit the quantity, rate, or concentration of emissions of air pollutants on a continuous basis." 42 U.S.C. 7602(k) (defining "emission limitation and emission standard"). See generally *Sierra Club v. EPA*, 551 F.3d 1019, 1021 (D.C. Cir. 2008) (emissions limitations under CAA section 112 must both continuously apply and meet section 112's minimum stringency requirements, even during periods of SSM). Thus, the EPA is required to ensure that section 112 emissions limitations are continuous. The affirmative defense for malfunction events meets this requirement by ensuring that, even where there is a malfunction, the emission limitation is still continuous by being enforceable through injunctive relief.

The EPA's objective in including affirmative defense as a facet of the standard is to provide relief from civil penalties for a class of violations where such penalties are not appropriate. Affirmative defense is not intended to relieve the owner/operator of the sanction of injunctive relief, or, as cited by the commenter, attorney fees, should a court find it appropriate to impose such a sanction.

The affirmative defense applies to civil penalties, including civil administrative penalties and penalties under section 120, but does not apply to injunctive relief or criminal penalties. The affirmative defense is available in any civil action to enforce the standards set forth in this rule, whether such action is brought by EPA, a state or local authority or a citizen. The EPA agrees that, in some cases, injunctive relief may not be appropriate if all the criteria of the affirmative defense have been satisfied. In such cases, liability for attorney's fees is not a real issue. However, some form of injunctive relief may be appropriate. The *Sierra Club v. Otter Tail Power Co.* case cited by the commenter is not on point and does not undermine EPA's ability to limit the affirmative defense to penalty claims. The concurrent remedy doctrine provides that,

[149] Compare, *e.g.*, 40 CFR 80.613 (stating that persons demonstrating specified defenses "will not be deemed in violation" and are not "deemed liable for a violation" of diesel fuel sulfur program regulations).

where a party's legal remedies are time-barred, a party's concurrent equitable claims generally are barred. The affirmative defense is not a time-bar to civil penalties. EPA does not intend to provide an affirmative defense to criminal charges as the very nature of criminal charges is that there is alleged to be a knowing violation (CAA section 113(c)(1) through (3)), or a knowing or negligence release that threatens imminent danger to persons (CAA section 113(c)(4) and (5)). In these circumstances, it is likely that the source did not do all that could be done to prevent the excess emissions. However, if there are circumstances that justify a knowing release as is suggested by the commenter, such circumstances can be raised in any enforcement action and may be the basis for a defense

The *Federal Register* notice cited by the commenters is almost four decades old and does not reflect subsequent amendments to the CAA and court decisions. In any event, the *Federal Register* notice merely states EPA's preference at that time for adopting regulations in order to formalize an approach to excess emissions caused by malfunctions. The EPA explained its view that such an approach was preferable to an informal enforcement discretion approach for the following reasons: "First, the existence of a formal process better informs the public of the policy and factual issues which will underlie enforcement of the standards. Second, affected industries which are making good-faith efforts to meet the standards will on the whole welcome a regularized means of informing the Agency in detail of the circumstances surrounding unavoidable emission excesses. Third, the Agency expects to benefit substantially from the information it will gain about the operation of the processes in question, for both future enforcement and standard setting." 37 FR 17214, 17214-15 (Aug. 25, 1972). The affirmative defense is not an informal enforcement discretion approach of the type that EPA rejected in 1972 and provides the benefits associated with the formalized approach that EPA identified in its 1972 proposal. See, *Mont. Sulphur & Chem. Co. v. United States EPA*, *2012 U.S. App. LEXIS 1056* (5th Cir. Jan 19, 2012) (in rejecting industry argument based on *Marathon Oil* that reliance on the affirmative defense was not adequate, the court stated "[h]owever, here the EPA does not rely on enforcement discretion alone, but specifically promulgates an affirmative defense in the FIP, which clearly defines the requirements to avoid penalties.").

Affirmative defense may be asserted in response to enforcement actions initiated by citizens, state, and local enforcement authorities.

The EPA's rationale for applying affirmative defense to civil penalties but not to injunctive relief is to avoid replicating with affirmative defense the periods created by startup, shutdown, and malfunction exemptions; that is, periods of time when standards were unenforceable by the EPA or any concerned party because no enforcement remedy was available for excess emissions during such times. The EPA reminds the commenter that EPA must establish emission standards that "limit the quantity, rate, or concentration of emissions of air pollutants on a continuous basis." 42 U.S.C. 7602(k) (defining "emission limitation and emission standard"). See generally *Sierra Club v. EPA*, 551 F.3d 1019, 1021 (D.C. Cir. 2008) (emissions limitations under CAA section 112 must both continuously apply and meet section 112's minimum stringency requirements, even during periods of SSM). Thus, the EPA is required to ensure that section 112 emissions limitations are continuous and effectively enforceable. The affirmative defense for malfunction events meets this requirement by ensuring that, even where there is a malfunction and where a source successfully asserts an affirmative defense to civil penalties, the emission limitation is still continuous and enforceable.

The EPA does not intend for affirmative defense to act as a substitute for standards that somehow incorporate emissions from malfunctions. As stated in the preamble, in exercising its authority under section 112 to establish emission standards (at a level that meets the stringency requirements of section 112), the EPA necessarily defines conduct that constitutes a violation. The EPA's view is that the affirmative defense is part of the emission standard and defines two categories of violation. Successful assertion of affirmative was not intended to and does not mean that a source would be found innocent of a violation. An assertion of affirmative defense follows a determination that source was in violation of an applicable standard.

91. Comment: Commenter 0160 expressed concern about how affirmative defense may be employed by the pulp and paper mills, specifically with respect to NCG venting from malfunctions regulated by §§63.443 and 64.446. The commenter noted that the venting allowances are cumulative during the reporting period and suggested that the 2-day notification and 45-day root cause analysis be submitted only after there is an actual exceedance of a percentage venting limit. The commenter expressed concern that mills may employ affirmative defense for every malfunction NCG venting as a preventative measure in case it were to exceed one of the percentage limits (1 percent, 4 percent, or 10 percent) and this could prove to be very burdensome to facilities and delegated state agencies. The commenter suggested that the 2-day notification and 45-day root cause analysis be submitted only after there is an actual exceedance of a percentage venting limit. The commenter also suggested limiting the number of 2-day affirmative defense notifications to ventings over two hours in length, or notifying for consolidated venting events after they add up to some threshold, such as 4 hours.

Commenter 0228 quoted §63.456(b) as follows regarding the affirmative defense reporting requirement in the proposed rule:

> The owner or operator seeking to assert an affirmative defense shall also submit a written report to the Administrator within 45 days of the initial occurrence of the exceedance of the standard in paragraphs §§63.443(c) and (d), 63.444(b) and (c), 63.445(b) and (c), 63.446(c), (d), and (e), 63.447(b) or §63.450(d) to demonstrate, with all necessary supporting documentation, that it has met the requirements set forth in paragraph (a) of this section. The owner or operator may seek an extension of this deadline for up to 30 additional days by submitting a written request to the Administrator before the expiration of the 45 day period. Until a request for an extension has been approved by the Administrator, the owner or operator is subject to the requirement to submit such report within 45 days of the initial occurrence of the exceedance.

Commenter 0228 noted that they require owners and operators to submit requests to exempt exceedances with their quarterly excess emission reports. These requests are typically considered within 30 days of receipt of the excess emissions report. The proposed provision appears to create a duplicative process for request and consideration of excess emissions. This separate process would potentially require perpetual consideration of exemption requests, rather than conforming to the state's current practice of submitting all requests pertaining to that quarter with the regular quarterly report (due within 30 days after the end of the calendar quarter. The proposed provision would impose inefficiency on the current process by creating unnecessary tracking and administrative work for both the facility and for state regulators. The commenter

requested that the proposed provision be changed so that assertions of affirmative defense are submitted on the same timeline as the quarterly excess emissions report.

Response: Concerning commenter 0228's note that the proposed subpart S affirmative defense reporting requirements appear to create a duplicative process for request and consideration of excess emissions, we note that states can petition for delegation. A state's affirmative defense requirements would have to be at least as stringent as EPA's.

In response to the concerns noted by commenters 0160 and 0228 regarding the timing of submittal of the affirmative defense notifications and reports, we have changed the requirements in §63.456(b) of the final rule to read as follows:

> … This affirmative defense report shall be included in the first periodic compliance, deviation report or excess emission report otherwise required after the initial occurrence of the violation of the relevant standard (which may be the end of any applicable averaging period). If such compliance, deviation report or excess emission report is due less than 45 days after the initial occurrence of the violation, the affirmative defense report may be included in the second compliance, deviation report or excess emission report due after the initial occurrence of the violation of the relevant standard.

As noted in a later response, we have also eliminated the 2-day notification requirement that was included in §63.456(b) at proposal because we will receive sufficient notification of malfunction events that result in violations in other required compliance reports, such as the malfunction report required under §63.455(g).

Regarding commenter 0228's concern about the proposed provisions creating the potential for perpetual consideration of exemption requests, we should note that affirmative defense is only available when a violation has occurred as a result of a malfunction; malfunctions themselves do not necessarily lead to violations. Furthermore, as defined in §63.456(a)(1)(i), affirmative defense was explicitly not designed for use with frequent events or as a preventative measure in anticipation of a violation, per the scenario described by commenter 0228.

92. Comment: According to commenter 0163, EPA acknowledges that malfunction periods are "sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment or a process to operate in a normal or usual manner" and argues that the CAA does not require them to include malfunction periods in development of MACT emission standards. [76 FR 81346] The commenter stated that, rather than structure a discrete and achievable emissions standard for malfunction events, the EPA places them in a netherworld where the emission limitations otherwise applicable during normal operating conditions may or may not be enforced depending on how well a facility meets, in EPA's eyes, a very broad set of conditions. The commenter noted that EPA provides an "affirmative defense" provision against civil penalties that requires a "preponderance" of evidence to support. [76 FR 81347]

Response: We acknowledge the commenter's statement concerning malfunction events and refer the commenter to other responses in this section concerning our approach on SSM and affirmative defense for the final rule (*e.g.*, responses to comment nos. 86 and 90).

93. Comment: Commenter 0218 maintained that the proposed affirmative defense from civil penalties for malfunctions is unlawful, and creates a new loophole that will reduce the deterrent impact of the proposed standards. The commenter argued that Congress plainly intended citizens to be able to enforce emission standards under the CAA using the full range of civil enforcement mechanisms available to the government, and, in the HAP context, subject only to the limitation that government not be "diligently prosecuting" its own civil enforcement action, according to CAA section 304(b)(1)(B) and 42 U.S.C. 7604(b)(1)(B).

The commenter stated that the EPA exceeded its authority by attempting to impose additional Agency-created limits on civil penalties, when the CAA spells out the only limits that Congress intended to impose on citizens' ability to seek and recover penalties in enforcement suits under CAA section 304, 42 U.S.C. 7604.320.

The commenter stated that the proposed affirmative defense goes directly against Congressional intent that judges should determine the size of civil penalties whenever they are sought, and that the proposal will impermissibly chill citizen participation and the ability to win an effective, deterrent remedy in CAA enforcement actions.

The commenter observed that the CAA gives the EPA minimal discretion that only applies to administrative penalties which may be imposed under subsection 113(d), but no authority to EPA to compromise, modify or limit civil penalties that a court may impose under section 113(e) or section 304. The commenter emphasized that the explicit reference to EPA's ability to modify penalties in one subsection and its absence in the other subsection of the same provision can only be understood as an intentional decision by Congress, which EPA may not contravene by rule.[150]

The commenter argued that the owner of a facility may be able to evade civil penalties after being sued by a community group for a violation of emission standards, if the owner satisfied the requirements set forth in EPA's proposed affirmative defense regulations.

The commenter stated that it is improper for a court to fail to consider these factors, or to fail to make its own determination of what civil penalties are "appropriate" under CAA section 304(a), and EPA should not ask a court to ignore its legal duty. The commenter observed that it is also improper for EPA to fail to consider the section 113(e)(1) factors in situations in which it

[150] *See* 42 U.S.C. 7413(e) (listing factors). Note that the proposed exemption would also be barred under *Chevron* step two or found to be arbitrary and capricious since, even if there exists some slight ambiguity, it is unreasonable to construe the statute as permitting EPA to short-circuit the consideration of specifically listed factors. See *Chevron*, 467 U.S. at 843 (explaining that if the statute does not answer the question at issue, "the question for the court is whether the agency's answer is based on a permissible construction of the statute"); *S. Coast Air Quality Mgmt. Dist. v. EPA*, 472 F.3d 882, 895 (D.C. Cir. 2006) ("We further hold that EPA's interpretation of the Act in a manner to maximize its own discretion is unreasonable because the clear intent of Congress in enacting the 1990 Amendments was to the contrary."); see also *Gen. Instrument Corp. v. F.C.C.*, 213 F.3d 724, 732 (D.C. Cir. 2000) (explaining that "an arbitrary and capricious claim and a *Chevron* step two argument overlap"); *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (explaining that agency acts in arbitrary and capricious manner if it fails to consider "relevant factors" or "entirely fail[s] to consider an important aspect of the problem"). By "upset[ting] the statutory balance struck by Congress," as discussed above, the affirmative defense is unreasonable under *Chevron* step two. *Int'l Alliance of Theatrical & Stage Employees v. N.L.R.B,* 334 F.3d 27, 35 (D.C. Cir. 2003).

is setting the penalty. CAA section 113(e)(1); 42 U.S.C. 7413(e)(1); see also *N.Y. Cross Harbor R.R. v. Surface Transp. Bd.*, 374 F.3d 1177, 1184 (D.C. Cir. 2004). It is impermissible for EPA to attempt to displace those factors or in any way alter their significance by creating a bar to penalties if certain Agency-defined considerations are met instead.

The commenter asserted that the burden the affirmative defense places on citizens makes it less likely that they will enforce the Act, that citizen participation in CAA enforcement will be hindered, in violation of citizens' rights to protect themselves from pollution and in direct conflict with congressional intent. The commenter also noted that several of the factors at issue in the affirmative defense undercut Congress' intent that citizen suit enforcement should avoid re-delving into "technological or other considerations." (*NRDC v. Train*, 510 F.2d 692, 724 (D.C. Cir. 1974) The commenter stated that the affirmative defense imposes a technical burden on citizens, and the burden renders the defense impermissible. The commenter predicted that the affirmative defense would likely be used on a routine basis by polluters seeking to avoid penalties, just as the malfunction exemption was, and enforcement of the Act could suffer.

The commenter expressed concern that the new "affirmative defense" may make it more likely that malfunctions happen, by giving industry a way to evade penalties, if facilities can show a violation was due to a malfunction.

The commenter argued that, if the EPA had authority to promulgate any type of affirmative defense to penalties for malfunctions, EPA should also promulgate the following provisions, and also must promulgate strong reporting, monitoring, and other compliance requirements (in separate comments):

- A specific amount of compensatory penalties should apply to each reported malfunction (consistent with the Act). These funds should be dedicated to enforcement, inspections, and monitoring in the local community around the specific facility, to create greater assurance that malfunctions will not happen again.
- The EPA must modify the regulations so that a facility or company cannot use the affirmative defense more than once within a set period of time, such as 10 years. The affirmative defense should become automatically unavailable to a facility that has previously had a malfunction within the last 10 years, to ensure that this defense does not swallow the value of the standards.

The commenter concluded that the EPA must work to expand and protect the ability of people harmed by air pollution to seek all appropriate and available forms of relief in court.

Response: The EPA's view is that the affirmative defense is consistent with CAA sections 113(e) and 304. Section 304 gives district courts jurisdiction "to apply appropriate civil penalties." Section 113(e)(1) identifies the factors that the Administrator or a court shall take into consideration in determining the amount of a penalty to be assessed, only after it has been determined that a penalty is appropriate. The affirmative defense regulatory provision is not relevant to the amount of any penalty to be assessed under section 113(e), because if a court determines that the affirmative defense elements have been established, then a penalty is not appropriate, and penalty assessment pursuant to the section 113(e)(1) factors does not occur.

In exercising its authority under section 112 to establish emission standards (at a level that meets the stringency requirements of section 112), the EPA necessarily defines conduct that constitutes a violation. The EPA's view is that the affirmative defense can be viewed as defining two categories of violation. If there is a violation of the emission standard and the source demonstrates that all the elements of the affirmative defense are met, only injunctive relief is available. All other violations of the emission standard are subject to injunctive relief and penalties. The CAA does not require that all violations be treated equally. Further, a citizen suit claim under section 304 allows citizens to commence a civil action against any person alleged to be in violation of "an emission standard or limitation under this chapter." The CAA, however, allows the EPA to establish such "enforceable emission limitations." Thus, the citizen suit provision clearly contemplates enforcement of the standards that are defined by the EPA. As a result, where the EPA defines its emissions limitations and enforcement measures to allow a source the opportunity to prove its entitlement to a lesser degree of violation (not subject to penalties) in narrow, specified circumstances, as the EPA did here, penalties are not "appropriate" under section 304.

The EPA's view is that an affirmative defense to civil penalties for exceedances of applicable emission standards during periods of malfunction appropriately balances competing concerns. On the one hand, citizen enforcers are concerned about additional complications in their enforcement actions. On the other hand, industrial sources are concerned about being penalized for violations caused by malfunctions that could not have prevented and were otherwise appropriately handled (as reflected in the affirmative defense criteria). The EPA has used its section 301(a)(1) authority to issue regulations necessary to carry out the Act in a manner that appropriately balances these competing concerns.

The EPA disagrees that the affirmative defense provision will hamper citizen enforcement. First, injunctive relief is still available, and the threat of penalties would not deter violations in cases where all of the conditions of the affirmative defense have been satisfied, because the affirmative defense criteria ensure that all reasonable steps were taken to prevent a malfunction that causes excess emissions.

Further, litigating whether a source has met the affirmative defense will not burden citizen groups any more or less than would litigating the appropriate penalty amount in the penalty assessment stage of a citizen suit enforcement action, because the section 113(e) penalty assessment criteria and the affirmative defense criteria are similar and, in fact, overlap. For example, the requirement that the Administrator or the court consider "good faith efforts to comply" is bound to generate the type of fact-intensive disputes of which the commenter complains. In addition, several of the affirmative defense criteria are exactly the type of criteria the Administrator or a court might consider in determining whether a source made "good faith efforts to comply." For example, to take advantage of the affirmative defense, the source must prove by a preponderance of the evidence that, among other things, the excess emissions "were caused by an unavoidable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner" and "could not have been prevented through careful planning, proper design or better operation and maintenance practices" and "did not stem from any activity or event that could have been foreseen and avoided, or planned for."

Thus, the EPA does not expect the affirmative defense provision to significantly alter the burden of bringing a citizen enforcement action. For those cases that do proceed to trial, even in the absence of this affirmative defense, sources generally raise equitable arguments to argue for a low penalty, and citizens often rebut such arguments. Therefore, as a practical matter, the EPA does not expect the affirmative defense provision to materially affect the practice of CAA enforcement.

The EPA is not adopting the commenter's suggestion with respect to compensatory damages or limits on the frequency of use of the affirmative defense. It is not clear that the EPA has authority to require the automatic imposition of compensatory damages, and even if such authority exists, the EPA does not think automatic imposition of damages is appropriate, as it would unduly complicate the enforcement process. Ensuring that malfunctions do not recur can be handled through imposition of appropriate injunctive relief. In addition, the EPA's view is that it would not be appropriate to limit a source's ability to take advantage of the affirmative defense to one time over a specified period of time such as 10 years, given that the affirmative defense is only available when the source could not have prevented the excess emissions. With respect to the commenter's suggested reporting requirements, the reporting requirements in the rule being promulgated already require malfunction reporting, and the affirmative defense provisions require that parties choosing to assert the affirmative defense meet additional malfunction reporting requirements. Any such reports submitted to the EPA are publicly available pursuant to CAA section 114.

94. Comment: Definition of Malfunction. Commenter 0168 noted the language that EPA proposed for defining malfunction in §63.456(a)(1) is similar to the definition in §63.2, with one major exception. In the proposed language, one of the conditions for an affirmative defense is that the excessive emissions were caused by a "sudden, infrequent, and unavoidable failure…" The GP definition of malfunction uses the phrase "not reasonably preventable" instead of the word "unavoidable." The commenter believes that this creates two different definitions of malfunction. The commenter saw no reason for two different definitions of a malfunction and requested that the Agency revise the proposed language to reflect the GP definition of a malfunction.

Response: The EPA disagrees that the criteria of the affirmative defense changes the definition of malfunction (as defined in §63.2) for purposes of the NESHAP program. The wording difference between the §63.456(a)(1) and the §63.2 malfunction definitions is because the EPA does not intend that the affirmative defense be available in every instance of a malfunction.

95. Comment: Root Cause Analysis Definition. Commenter 0168 noted that the term "root cause analysis" implies a specific formal process, and there are several techniques that may be called "root cause analysis," depending on the author and industry. For many malfunctions, the cause is immediately obvious, and a formal process for determining the cause is not needed. When a malfunction occurs, the expectation is that the facility will correct the problem as quickly as possible and return to their operating window. A formal root cause analysis is typically limited to very significant events or repeat events. The proposed language assumes that all malfunctions are equally significant and need an identical degree of investigation. The

commenter asserted that a formal root cause analysis should only be used when other reasonable methods fail to show what caused the malfunction or when the serious nature of an event might make such an analysis necessary. Moreover, other tools may be more appropriate (*e.g.*, failure mode and effect, fault tree, *etc.*), or more powerful tools may be introduced in the future. The facility is the only one that can and should decide what tool to use to determine the cause of the malfunction.

If EPA intends for the facility to investigate and fix the source of the malfunction so that it is less likely to recur, the commenter supported that concept, but suggested that EPA use a term other than "root cause analysis" that does not carry a specific meaning. However, if the Agency envisions a formal process for determining the root cause for every malfunction, no matter how simple, the commenter asserted that this is unnecessary and would result in excess efforts with no environmental gains.

Response: In the context of this rule, the term "root cause analysis" was used generically to imply an analysis of sufficient depth and complexity to indicate whether a malfunction did indeed cause a failure to meet a standard, provide sufficient information on the nature and cause of a malfunction to determine whether the source had a malfunction that met the definition of a malfunction, and whether civil penalties are an appropriate sanction for the violation if one occurred. The term "root cause analysis" is not defined in subpart A (the GP) or in the subpart being promulgated, subpart S. The EPA did not intend to prescribe a specific methodology, given that "root cause analysis" is not a defined term in the applicable subparts of part 63.

While conducting an analysis of every malfunction may be a "best practice," for regulatory purposes, an analysis is only required for those malfunctions for which the source chooses to assert an affirmative defense, and not every malfunction is significant enough to warrant the assertion. The EPA expects that sources seeking to minimize emissions will endeavor to determine what went wrong anytime there is a minor or major malfunction, and the facility should decide what level of investigation is needed in each instance. We agree with the commenter that sources should use appropriate techniques of analysis to achieve the desired results and conclusions in the event of a malfunction. The EPA joins the commenter in seeking meaningful results which successfully identify, and address the cause of the malfunction.

The EPA expects that a minor administrative burden will result in sources analyzing their violative emissions to reduce or avoid those emissions in the future, which is an environmental benefit. However, in most cases, EPA expects that a properly conducted root cause analysis will have such results. Such an analysis is beneficial in resolving or preventing violations and excess emissions whether the source seeks to assert the affirmative defense or not. A root cause analysis is one example of what constitutes good air pollution control practices to minimize emissions.

96. Comment: Rebuttable Presumption Commenters 0168, 0164, and 0207 suggested that EPA should modify the affirmative defense provisions so that it is a "rebuttable presumption." As EPA knows, malfunctions will occur. Even the best run facilities will have circumstances where events happen that are out of their control. While the commenters asserted that EPA must take into account the conditions that occur during malfunctions and establish limits that consider these circumstances, they also agreed that some form of enforcement discretion is needed for malfunctions. The commenters expressed support for EPA to maintain a regulatory provision for

malfunctions. However, the commenters 0163, 0164, 0168, and 0207 were concerned that allowing a facility to interpose an affirmative defense for violations caused by malfunctions implies that the facility is guilty until proven innocent and improperly shifts the burden to the facility. Therefore, commenter 0168 suggested that EPA establish a rebuttable presumption (rather than affirmative defense), where it is presumed that any violation occurring during the malfunction was not the facility's fault unless the Agency proves certain facts that are enumerated in the rules. This will allow the Agency to challenge the alleged deviation without compromising the legal rights of either party.

According to commenter 0162, even if the proposed affirmative defense was not unreasonably restrictive, being able to assert a defense obviously is not the same as complying with emission limitations that are properly set in accordance with CAA section 112. The commenter noted that, even though a source believes it qualifies for the affirmative defense, it may be considered to have violated the standards—and may have to report violations, certify noncompliance, *etc.*—until there has been an enforcement proceeding, and the source has successfully asserted the affirmative defense. Commenter 0162 argued that the affirmative defense places the source in the position of proving its innocence, rather than EPA or another enforcement authority having to prove that the source violated the CAA.

Commenter 0162 contended that EPA, in this instance, has not provided any statutory authority, nor any real justification, for requiring a source to prove its innocence, including fully demonstrating its innocence within 45 days of the event, without even being charged. In the event EPA adopts an approach like the proposed affirmative defense, the commenter suggested it include these terms: "Once a source has claimed that its excess emissions were related to a malfunction, it should not be considered to be in violation of the standards unless the enforcement authority demonstrates that the source is not entitled to claim the malfunction."

Response: The EPA does not agree with the commenters' requested approaches regarding affirmative defense. The "rebuttable presumption" approach requested by commenters 0168, 0164, and 0207 would shift the burden of proof for the affirmative defense from the source to the EPA, as would the similar approach requested by commenter 0162 to state the affirmative defense in terms that, once a source has claimed that its excess emissions were related to a malfunction, it will not be considered to be in violation of the standards unless the enforcement authority demonstrates that the source is not entitled to claim the malfunction. It is the source, not the EPA, which has the relevant information to assess whether a particular event qualifies as a malfunction and meets the affirmative defense. Furthermore, the commenters' requested approaches appear to be similar to the scheme that the D.C. Circuit Court vacated in the *Sierra Club* case, in that there would be no violation unless the enforcing party (EPA or a citizen), established that the event in question was not a malfunction.

The EPA also disagrees with comments that criticize the affirmative defense for shifting the burden of proof. The affirmative defense does not require a facility to prove its innocence rather than requiring an enforcement authority to prove a violation of the CAA or change the burden of proof with respect to establishing a violation. The affirmative defense applies to penalties and, thus, is only used where a violation has been established. The burden of proof remains with the plaintiff in an enforcement action. See, *e.g.*, §22.24. If a violation has been established and a source wishes to assert the affirmative defense with respect to penalties, the

source does bear the burden of establishing that the elements of the affirmative defense have been met. This burden-shifting is appropriate because the source is in a better position to determine the facts required to establish the defense. See, *e.g.*, *Arizona Pub. Serv. Co. v. EPA,* 562 F.3d 1116, 1120, 1129-30 (10th Cir. 2009) (rejecting industry challenge to the EPA's use of an affirmative defense to address excess emissions during malfunction events).

In response to commenter 0162's concern about the rule "requiring a source to prove its innocence, including fully demonstrating its innocence within 45 days of the event," as noted in the following response, we have revised the 45-day affirmative defense reporting requirement to require sources to submit the affirmative defense report with the next compliance report.

97. Comment: Immediate Notification. Commenter 0168 referenced a recently proposed rule (77 FR 4522, 4538, January 30, 2012), in which EPA proposed dropping the immediate notification process and simply requiring a written report within 45 days of the malfunction. The commenter suggested that the Agency adopt the same change in the pulp and paper regulation. Commenter 0162 also noted that EPA recently proposed almost identical affirmative defense requirements in its proposed reconsideration of various provisions of the Chemical Manufacturing Area Source Rule (77 FR 4522, January 30, 2012), but omitted the 2-day notification requirement. The commenter hoped that this indicates that EPA has been persuaded by comments submitted by the SSM Coalition (of which commenter 0162 is a member) and others that the 2-day notification requirement is onerous and burdensome. Commenter 0162 requested that, at a minimum, EPA abandon the 2-day notification requirement in the final pulp and paper RTR rule, consistent with its proposed provisions for the Chemical Manufacturing Area Source Rule.

Response: The EPA has evaluated some of the affirmative defense criteria, and is revising both the immediate notification and 45-day malfunction report. The EPA has removed the requirements to notify the EPA within 2 days of violation of a standard in order to be able to avail themselves to a claim for affirmative defense and instead requires that the affirmative defense report be included in the first periodic compliance, deviation report or excess emission report otherwise required after the initial occurrence of the violation of the relevant standard (which may be the end of any applicable averaging period). If such compliance, deviation report or excess emission report is due less than 45 days after the initial occurrence of the violation, the affirmative defense report may be included in the second compliance, deviation report or excess emission report due after the initial occurrence of the violation of the relevant standard.

98. Comment: 45-Day Report Period. Commenter 0162 described as unreasonable the provision allowing sources only 45 days to provide the extensive documentation required by the affirmative defense as currently written, including a completed root cause analysis. The commenter further described as unnecessary and burdensome EPA's "guilty until proven innocent" approach of requiring complete documentation that an event qualifies for the affirmative defense at the time of the event. According to the commenter, if EPA persisted in requiring such reporting, 90 days is the minimum time that should be allowed for the written report, unless EPA substantially streamlines the criteria for the affirmative defense, consistent with their comments.

Commenter 0162 noted several problems with the proposed 45-day period for submitting a written report demonstrating that the source qualifies for the affirmative defense, a period which commences on the date of "the initial occurrence of the exceedance of the standards" (see proposed §63.456(b)). According to the commenter, much of the required content of that written report could not be created until the malfunction event ceased—which the commenter indicated could be many days after the malfunction commenced. As an example, the commenter noted that if a biological wastewater treatment system stopped providing sufficient HAP removal efficiency, it could take days to identify the nature of the problem and weeks to reestablish a sufficient microorganism community to again meet treatment requirements. The commenter pointed out that this could give the source much less than 45 days, in practice, to prepare the report.

According to commenter 0162, the provision in the proposed rule for requesting and obtaining an extension of the reporting deadline of up to 30 days would provide little practical relief. The commenter noted that the source would have to submit the report within 45 days unless the EPA Administrator (or his or her authorized representative, see §60.2) granted the extension request before the expiration of the initial 45-day period, which the commenter said is not likely to happen until shortly before, if not after, the report would otherwise be due. At a minimum, the commenter recommended that the rule provide that a request for extension of the reporting deadline be considered granted if EPA has not acted on it within 10 days.

Because of the problems commenter 0162 described above regarding the timing of required reporting, the commenter requested that malfunction reporting be required on a semi-annual basis for malfunctions that occurred during the preceding 6 months (the same frequency as similar reports pursuant to NESHAP and Title V permit requirements). The commenter stated that this would enable EPA to review the source's compliance history and the measures being taken to address malfunctions, without imposing unworkable reporting deadlines (or potentially encouraging sources to bombard EPA with reports for malfunctions that may not ultimately result in the source exceeding the 30-day average emission limitation). According to the commenter, there is no indication anywhere that EPA has justified departing from its conclusion that semi-annual reporting of malfunctions is sufficient, as reflected in the current subpart S standards (see §63.455(a)).

Response: The EPA has evaluated some of the affirmative defense criteria, and is revising both the immediate notification and 45-day malfunction report. Instead, the final rule allows owners or operators seeking to assert an affirmative defense to demonstrate, with all necessary supporting documentation (as was required under the proposed 45-day report), that it has met the affirmative defense criteria by submittal of the affirmative defense report in the first periodic compliance, deviation report, or excess emission report otherwise required after the initial occurrence of the violation of the relevant standard (which may be the end of any applicable averaging period). If such compliance, deviation report, or excess emission report is due less than 45 days after the initial occurrence of the violation, the affirmative defense report may be included in the second compliance, deviation report, or excess emission report due after the initial occurrence of the violation of the relevant standard. This change provides sources with sufficient time to demonstrate that they have met the required affirmative defense criteria.

99. Comment: Electronic Communication. Commenter 0168 stated that EPA should allow notification by e-mail or other electronic means. As facilities and EPA move toward electronic recordkeeping, it makes no sense to require keeping a "properly signed, contemporaneous operating logs" as a requirement for an affirmative defense. As such, the commenter suggested modifying this provision. In addition, it is impossible to eliminate the causes for certain malfunctions (*e.g.*, lightning strikes).

In a similar comment, commenter 0228 quoted §63.456(b) as follows:

> The owner or operator of the affected source experiencing an exceedance of its emission limit(s) during a malfunction shall notify the Administrator by telephone or facsimile (FAX) transmission as soon as possible, but no later than two business days after the initial occurrence of the malfunction, if it wishes to avail itself of an affirmative defense to civil penalties for that malfunction.

Commenter 0228 suggested that this section be changed so that EPA broadens its communication options to include electronic media such as e-mail to be used when the facility contacts the Administrator. The commenter's state compliance staff sometimes requests submittal of the 48-hour notification via e-mail rather than by fax or telephone. In cases where telephone is more expeditious or there is cause for discussion, the regulatory agency might ask the owner or operator to follow up the phone call with a written form sent via e-mail.

Response: The EPA generally accepts documents in electronic format, as long as the format is compatible with the requirements of the standards. For the affirmative defense provisions, the owner or operator of a facility experiencing an exceedance of its emission limit(s) during a malfunction must notify the Administrator by telephone or fax transmission of the exceedance. However, the written reports are required to demonstrate that the affirmative defense provisions have been met. In the case of signed logs, the EPA accepts electronically signed operating logs, where the format and method of submission meets the regulatory criteria and are compatible with the EPA's and the delegated authorities' electronic submission systems. Any source submitting records electronically should exercise due diligence to assure receipt by the EPA and the delegated authority.

100. Comment: Affirmative Defense Language. Commenter 0168 suggested that EPA clarify its affirmative defense provisions. While the commenter preferred that EPA use a rebuttable presumption, should the Agency keep the affirmative defense concept, the commenter suggested the following modifications to the language to make it more usable. The commenter understood that most of the provisions EPA proposed for the affirmative defense came from earlier guidance memos. While these provisions were in guidance, the Agency did not need to be careful of the wording, since they were only guidance and did not have the weight of regulation. However, if the Agency wants to codify this guidance into regulatory language, several changes are needed. For example, EPA should drop the reference to "any" activity in this section. There are also several references to "All" that would make it difficult to satisfy the requirements of an affirmative defense. In addition, the language in the provision is contradictory. In paragraph (a), the phrase "preponderance of evidence" is used, while later in that paragraph (iii), the language refers to "any activity," meaning that more than preponderance of evidence is needed. This same trend occurs in paragraphs (5) "All possible," (6) "All," (7) "All of the actions," and (8) "At all

times." While "all" would include "preponderance," "preponderance" does not mean all of the time. The commenter suggested that the phrase "preponderance of evidence" is adequate and the references to "all" and "any" in the later paragraphs should be modified.

Commenter 0162 argued that the proposed affirmative defense as written was unreasonable and impracticable. According to the commenter, many aspects of the affirmative defense would make it unavailable as a practical matter for many, if not most, malfunctions. The commenter said that EPA needed to substantially revise and streamline the proposed affirmative defense for it to be of practical value. Commenter 0162 stated that the affirmative defense provision in proposed §63.456(a) lists numerous conditions that the commenter said may be appropriate in determining whether excess emissions during a malfunction should be considered a violation, but ought not be listed as mandatory criteria, all of which a source has to meet to even raise an affirmative defense. As an example, the commenter cited proposed §63.456(a)(1)(i), which requires that, to establish an affirmative defense, the source must prove that the excess emissions were "caused by a sudden, infrequent, and unavoidable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner…." According to the commenter, there is no apparent reason why a "sudden" and "unavoidable" equipment failure or process upset leading to emissions greater than the MACT emission limitation should be considered a violation of the standards if it is not "infrequent," even though it is "not part of a recurring pattern indicative of inadequate design, operation, or maintenance" and "[c]ould not have been prevented through careful planning, proper design or better operation and maintenance practices" (proposed §63.456(a)(1)(ii)&(iv)).

Commenter 0162 also noted that a number of the conditions for establishing an affirmative defense use phrases that are subject to a wide range of interpretations and do not appear reasonable or cost-effective. The commenter inquired how an enforcement authority or judge could determine whether "proper design" or "better operation and maintenance practices" could have prevented a malfunction (§63.456 (a)(1)(ii)), whether a recurring malfunction is a result of "inadequate design" (§63.456(a)(1)(iv)), whether repairs were made "as expeditiously as possible" (§63.456(a)(2)), whether the source took "all possible steps" to minimize the impact of the excess emissions (§63.456(a)(5)), and whether emissions control systems "were kept in operation if at all possible"(§63.456(a)(6)).

Commenter 0162 acknowledged that, in some cases, it may have been possible to prevent the malfunction or further reduce the excess emissions if the source had spent huge amounts of money with little emission reduction or had imposed economically impracticable constraints on its operation. According to the commenter, the affirmative defense, as proposed, leaves open the possibility that a source will be considered to be in violation because the enforcement authority decides subjectively that, in one or more respects, it would have been "proper" or "possible" for the source to take further steps to prevent or minimize the malfunction.[151] In effect, the commenter contended, EPA or the court may impose an extreme version of MACT during malfunction periods, without any application of the beyond-the-floor factors in CAA section 112(d)(2). The commenter argued that, at a minimum, the vague and unqualified descriptors in

[151] In contrast, commenter 0162 noted, EPA has included provisions in other NESHAPs explicitly recognizing that backup control devices are not required. See, *e.g.*, 40 CFR 63.480(j) ("Backup control devices are not required, but may be used if available.").

the criteria for demonstrating the affirmative defense will inevitably lead to varying conclusions as to whether a violation has occurred, resulting in inconsistency from one jurisdiction to the next.

Commenter 0162 objected to the language in proposed §63.456(a)(6), which requires, as a condition for the affirmative defense, that all emissions "control systems were kept in operation if at all possible." The commenter argued that the phrase "if at all possible" should not be used because it is an extreme term that bears no relation to good air pollution control practices. The commenter also indicated that this provision should be qualified, as the commenter said EPA has qualified similar provisions in the NESHAP GP in §63.6. As an example, the commenter said these conditions should be qualified with caveats that the operation must be consistent with safety and good air pollution control practices, that it does not require the source to make further efforts to reduce emissions below what the standards require, and that it does not require regular operation of backup or standby pollution control equipment.[152] The commenter noted that that EPA has long recognized, in the NSPS GP, that it is appropriate to require sources to operate the affected facility and related air pollution control technology "to the extent practicable…consistent with good air pollution control practice for minimizing emissions" during SSM periods, not "if at all possible" (see §60.11(d); see also, *e.g.*, §63.480(j)(4) (during SSM events, Group I Polymer & Resin plants are required to use "to the extent reasonably available, measures to prevent or minimize excess emissions to the extent practical.")). Commenter 0162 argued that EPA cannot abandon those rational approaches and adopt the kind of absolute requirements implied by the proposed rule, without an explanation of why it is necessary and appropriate to do so. The commenter pointed out that EPA recently agreed to insert language in several NESHAPs to clarify that the general duty to minimize emissions "does not require the owner or operator to make any further efforts to reduce emissions if levels required by this standard have been achieved" (76 FR 22566, 22583, col. 3 (April 21, 2011)).

According to commenter 0162, proposed §63.456(a)(4) would preclude a facility from taking advantage of the affirmative defense if the malfunction involved bypassing control equipment or a process and the bypass was not "unavoidable to prevent loss of life, severe personal injury, or severe property damage." The commenter asserted that this language is stated in such strong terms that it may be difficult or impossible for a source to demonstrate that it meets this criterion, even though bypassing the control equipment or the process was an appropriate exercise of good air pollution control practices. The commenter cited an example that a bypass can constitute the best air pollution control practice in response to an upset in order to prevent excess emissions (*e.g.*, to avoid fouling of pollution control equipment media that in turn would result in reduced pollution control equipment efficiency or increased pollution control equipment downtime). The commenter further noted that there can be substantial room for disagreement about what constitutes "severe" property damage. The commenter also inquired about the degree of injury to employees that the bypass must avoid in order to qualify as avoiding "severe" personal injury. According to the commenter, besides the unclear and subjective nature of these criteria, there is nothing inherent to section 112 standards that requires a source to avoid bypassing control equipment to such a degree. Lastly, the commenter argued

[152] According to commenter 0162, EPA also determined it was appropriate to include those kinds of caveats in its regulation requiring proper operation and maintenance of wastewater treatment facilities, in 40 CFR 122.41(e).

that it is not apparent, and that EPA has not attempted to explain, why the CAA would not allow bypassing "a process" in this way.

Commenter 0162 also objected to the language in proposed §63.456(a)(5), under which a source claiming the affirmative defense must prove that: "All possible steps were taken to minimize the impact of the excess emissions on ambient air quality, the environment and human health." In addition to objecting to the subjective term "all possible steps," the commenter also objected to the disconnect in this provision between the absolute and extreme requirement of the affirmative defense and the provisions of the CAA designed to attain ambient air quality standards and protect human health and the environment. According to the commenter, the CAA does not require sources to take "all possible steps" to control emissions, even to minimize the impact of hazardous air pollutant emissions on human health under CAA section 112(f). In addition, the commenter indicated that it is unclear how this criterion for qualifying for the affirmative defense differs from proposed §63.456(a)(3), which requires that the frequency, amount, and duration of excess emissions "were minimized to the maximum extent practicable." The commenter recommended that §63.456(a)(5) be eliminated, unless EPA explains what additional showing would be needed by that paragraph.

According to commenter 0162, the requirement in proposed §63.456(a)(9) that the source "have prepared a written root cause analysis to determine, correct and eliminate the primary causes of the malfunction and the excess emissions resulting from the malfunction event at issue" again does not implement the statutory criteria for standard-setting under section 112. The commenter stated that the requirement, if read literally, would mean that a source could never take advantage of the affirmative defense if the source was unable to determine the primary cause of the malfunction or was unable to correct that cause. The commenter noted that EPA has defined a malfunction as an event that is "unavoidable" and unforeseeable, and "not reasonably preventable" (see proposed §63.456(a)(1)(ii)&(iii) and §63.2) and indicated that, in many cases, it is expected that the primary cause(s) of the malfunction will not be ascertainable, or it will not be possible to identify a way to ensure the malfunction will not recur.[153] In addition, the commenter argued that requiring the facility to eliminate the primary causes of the malfunction—without regard to "taking into consideration the cost of achieving such" elimination and the "non-air quality health and environmental impacts and energy requirements" associated with its elimination—is unreasonable and entirely inconsistent with the criteria for standards established under CAA section 112(d).[154]

[153] According to commenter 0162, EPA has long acknowledged this reality in the NSPS GP, which requires that written reports of excess emissions include the "nature and cause of any malfunction, if known…." See 40 CFR 60.7(b)(2) (emphasis added). The commenter argued that it would be arbitrary and capricious for EPA not to include similar language here.

[154] As an example, commenter 0162 stated that it might be theoretically possible to eliminate the excess emissions associated with the malfunction by installing totally redundant pollution control equipment, or pollution control equipment with far more capacity than needed for normal operations. However, the commenter argued, this would not reflect the performance of the best performers on which the MACT "floor" is to be based, nor would it appear to take cost and other factors into consideration as the statute requires for beyond-the-floor MACT standards. The commenter further argued that the proposed requirement to eliminate "the primary causes of the malfunction" and not just to eliminate "the excess emissions resulting from the malfunction event" lies entirely outside of EPA's authority under the CAA, which the commenter said is limited to establishing and enforcing emission limitations, not dictating plant operations.

Commenter 0168 suggested that EPA consider making the following modifications to the regulatory language in §63.456 (using strikeout to show text deleted and underline to show text added) to address the concerns mentioned above and to make affirmative defense a more useful tool:

§ 63.456 Affirmative Defense for Exceedance of Emission Limit During Malfunction. In Response to an action to enforce the standards set forth in paragraphs §§ 63.443(c) and (d), 63.444(b) and (c), 63.445(b) and (c), 63.446(c), (d), and (e), 63.447(b) or § 63.450(d) the owner or operator may assert an affirmative defense to a claim for civil penalties for exceedances of such standards that are caused by malfunction, as defined at 40 CFR 63.2. Appropriate penalties may be assessed, however, if the owner or operator fails to meet the burden of proving all of the requirements in the affirmative defense. ~~The affirmative defense shall not be available for claims for injunctive relief.~~

(a) To establish the affirmative defense in any action to enforce such a limit, the owner or operator must timely meet the notification requirements in paragraph (b) of this section, and must prove by a preponderance of evidence that:

(1) The excess emissions:

(i) Were caused by a sudden, infrequent, and ~~unavoidable~~ not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner, and

(ii) Could not have been reasonably prevented through careful planning, proper design or better operation and maintenance practices; and

(iii) Did not stem from any activity or event that could have been reasonably foreseen and avoided, or planned for; and

(iv) Were not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and

(2) Repairs were made as expeditiously as possible when the applicable emission limitations were being exceeded. Off-shift and overtime labor were used, to the extent practicable to make these repairs; and

(3) The frequency, amount and duration of the excess emissions (including any bypass) were minimized to the maximum extent practicable during periods of such emissions; and

(4) If the excess emissions resulted from a bypass of control equipment or a process, then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and

(5) ~~All possible~~ Reasonable steps were taken to minimize the impact of the excess emissions on ambient air quality, the environment and human health; and

(6) ~~All e~~Emissions monitoring and control systems were kept in operation if at all possible, consistent with safety and good air pollution control practices; and

(7) ~~All of the a~~Actions in response to the excess emissions were documented ~~by properly signed, contemporaneous operating logs;~~ and

(8) ~~At all times, t~~The affected source was operated in a manner consistent with good practices for minimizing emissions; and

(9) A written ~~root cause analysis~~ report has been prepared, the purpose of which is to determine, ~~correct,~~ and ~~eliminate~~ mitigate the primary causes of the malfunction and the excess emissions resulting from the malfunction event at issue. Facility personnel will determine the appropriate type of analysis required (may include but not limited to root cause analysis, failure mode and effect, fault tree, *etc.*) to identify the cause of the

malfunction. The ~~analysis~~ report shall also specify, using best monitoring methods and engineering judgment, the amount of excess emissions that were the result of the malfunction.

(b) *Notification.* The owner or operator of the affected source experiencing an exceedance of its emission limit(s) during a malfunction ~~shall notify the Administrator by telephone or facsimile (FAX) transmission as soon as possible, but no later than two business days after the initial occurrence of the malfunction, if it wishes to avail itself of an affirmative defense to civil penalties for that malfunction. The owner or operator seeking to assert an affirmative defense shall also~~ submit a written report to the Administrator within 45 days of the initial occurrence of the exceedance of the standard in paragraphs §§ 63.443(c) and (d), 63.444(b) and (c), 63.445(b) and (c), 63.446(c), (d), and (e), 63.447(b) or § 63.450(d) to demonstrate, with all necessary supporting documentation, that it has met the requirements set forth in paragraph (a) of this section. The owner or operator may seek an extension of this deadline for up to 30 additional days by submitting a written request to the Administrator before the expiration of the 45 day period. Until a request for an extension has been approved by the Administrator, the owner or operator is subject to the requirement to submit such report within 45 days of the initial occurrence of the exceedance.

Response: Many of the conditions in the affirmative defense are modeled after the affirmative defense in EPA's State Implementation Plan (SIP) SSM policy, see, ***e.g.***, State Implementation Plans: Policy Regarding Excessive Emissions During Malfunctions, Startup, and Shutdown (Sept. 20, 1999); other conditions are modeled after a Federal Implementation Plan (FIP) promulgated by EPA (§50.1312). The EPA's view is that use of consistent terms in establishing affirmative defense regulations and policies across various CAA programs will promote consistent implementation of those rules and policies.

The commenter is mistaken regarding the sequence of circumstances in which affirmative defense can apply, noting that the affirmative defense, as proposed, leaves open the possibility that a source will be considered to be in violation because the enforcement authority decides subjectively that, in one or more respects, it would have been "proper" or "possible" for the source to take further steps to prevent or minimize the malfunction. The affirmative defense applies only where a violation has been established. The affirmative defense does not require a facility to prove, in advance, its innocence or change the burden of proof with respect to establishing a violation. The burden of proof that a violation occurred remains with the plaintiff in an enforcement action. See, ***e.g.,*** §22.24. If a violation has been established and a source wishes to assert the affirmative defense with respect to penalties, the source does bear the burden of establishing that the elements of the affirmative defense have been met. This burden-shifting is appropriate because the source is in a better position to determine the facts required to establish the defense. See, ***e.g., Arizona Pub. Serv. Co. v. EPA***, 562 F.3d 1116, 1120, 1129-30 (10th Cir. 2009) (rejecting industry challenge to EPA's use of an affirmative defense to address excess emissions during malfunction events.).

The EPA asserts that the affirmative defense criteria are well-defined and will assist EPA and the courts in making reasoned determinations as to the establishment of affirmative defenses. The EPA and the courts have expertise and experience in evaluating and applying criteria such as those for the affirmative defense. As noted above, many of the conditions were modeled after the

conditions of the affirmative defense in EPA's SIP SSM policy, which several states have adopted into their SIPs. We do not have any indication that parties to enforcement proceedings have had any significant difficulties applying the terms of these SIP affirmative defenses. However, EPA understands that some of the terms or phrases in the regulatory text establishing the affirmative can be revised or streamlined to some extent.

The EPA has evaluated some of the affirmative defense criteria as follows for the final rule:

- Timely Notification: The EPA has removed the requirement to notify the EPA within 2 days of violation of a standard in order to be able to avail themselves to a claim for affirmative defense. The EPA instead allows owners or operators seeking to assert an affirmative defense to demonstrate, with all necessary supporting documentation (as was required under the proposed 45-day report), that it has met the affirmative defense criteria by submittal of the affirmative defense report in the first periodic compliance, deviation report or excess emission report otherwise required after the initial occurrence of the violation of the relevant standard (which may be the end of any applicable averaging period). If such compliance, deviation report or excess emission report is due less than 45 days after the initial occurrence of the violation, the affirmative defense report may be included in the second compliance, deviation report or excess emission report due after the initial occurrence of the violation of the relevant standard. This change provides sources with sufficient time to demonstrate that they have met the required affirmative defense criteria.
- "Infrequent" Events: The EPA contends that, if malfunctions occur on a frequent basis, the basis for the malfunction more likely falls in the categories of poor design, poor operational decision making, or failure to operate a source in a normal manner and has retained the word "infrequent" in this criteria element.
- "Off-shift and Overtime Labor": The EPA contends that, rather than impair a sources response to a malfunction, the use of off-shift and overtime labor supports the premise that urgency is necessary to minimize excess emissions associated with a malfunction and has retained this language in the criteria.
- Severe Property Damage: The EPA contends that a bypass of control equipment or a process, which results in a violation, should be an exception and not undertaken lightly, and has maintained the word "severe" in this criteria.
- Signed Operating Logs: As an alternative, the EPA accepts electronically signed operating logs where the format and method of submission meets the regulatory criteria and are compatible with the EPA and the delegated authorities' electronic submission systems. Any source submitting records electronically should exercise due diligence to assure receipt by the EPA and the delegated authority.
- Root Cause Analysis: The EPA asserts that it has provided clear criteria within the affirmative defense provisions to support the development of an affirmative defense report. The EPA contends that these provisions will result in a minor administrative burden, but will result in sources analyzing their violation emissions to reduce or avoid those emissions in the future, which is an environmental benefit. A root cause analysis is not mandatory and is only required if a source seeks to assert an affirmative defense. However, such an analysis is beneficial in resolving or preventing violations and excess

emissions whether the source seeks to assert the affirmative defense or not. A root cause analysis is one example of what constitutes good air pollution control practices to minimize emissions. A root cause analysis is not required for every malfunction, as specified above, and is *only required* for those malfunctions for which the source chooses to assert an affirmative defense.

101. Comment: Burden. Commenter 0162 said that it was unclear where EPA found the legal authority in the CAA to shift the burden to the regulated community of proving (or disproving) essential elements of an alleged violation. The commenter stated that the CAA is silent as to the issue, and "the ordinary default rule [is] that plaintiffs bear the risk of failing to prove their claims." *Shaeffer v. Weast*, 546 U.S. 49 (2005), quoting McCormick on Evidence §337, at 412 ("The burdens of pleading and proof with regard to most facts have and should be assigned to the plaintiff who generally seeks to change the present state of affairs and who therefore naturally should be expected to bear the risk of failure or proof or persuasion"); C. Mueller & L. Kirkpatrick, Evidence §3.1, p. 104 (3d ed. 2003) ("Perhaps the broadest and most accepted idea is that the person who seeks court action should justify the request, which means that the plaintiffs bear the burdens on the elements in their claims"). According to the commenter, while the Supreme Court has recognized exceptions such as affirmative defenses, courts retain the authority to establish such rules unless Congress acts to delegate that authority.

Finally, commenter 0162 rejected as unreasonable and unnecessary the requirement in proposed §63.456(b) to notify the Administrator by telephone or fax as soon as possible, but no later than two business days after the malfunction begins, and then to submit a written report within 45 days of the initial occurrence of the malfunction that demonstrates, "with all necessary supporting documentation," that the source met all of the multitude of criteria for the affirmative defense. The commenter stated that it is novel at best for a person to be determined to have acted unlawfully unless the person has submitted his entire defense before he is even notified of a potential enforcement action. The commenter pointed out that, in many cases, it would be obvious to the enforcement authority, based on the kind of short malfunction or deviation report sources already submit under many air programs, that an exceedance of the proposed standards resulted from an unforeseen and unavoidable equipment failure or process upset. According to the commenter, it is extremely inefficient and burdensome, for both sources and regulators, to require a complete justification of the affirmative defense before the enforcement authority has indicated any need for further investigation.

Other commenters (0164, 0168, 0163 and 0207**)** also pointed out that, since EPA would require a source operator to demonstrate he qualifies for the affirmative defense at the time the exceedance occurs, the proposed SSM provisions would impose huge paperwork burdens on industry and on the enforcement agencies that are not necessary or justifiable. Commenter 0164 stated that promulgating a requirement that EPA knows cannot be met with the identified control technology, and then forcing a company to prove it is entitled to suspension of civil penalties for such events, raises serious constitutional questions. Commenter 0164 noted that even if it were legally acceptable (which it is not) for EPA to promulgate unworkable emission standards and then offer an affirmative defense to penalties for the expected exceedances of those standards, the restrictions and requirements EPA proposes for the affirmative defense are unreasonable and impracticable. If EPA persists in relying on a defense contained in the standards in lieu of

promulgating proper standards that apply during malfunction periods, the affirmative defense in the proposed rule would at a minimum require substantial modification and streamlining.

According to commenter 0162, since the affirmative defense is only available if all criteria are met, including the 48-hour and 45-day notifications, and since sources will have no way of knowing whether there might be an enforcement action or citizen suit at some point in the future addressing the period affected by a malfunction, sources will need to submit notifications of the malfunction, with all the supporting documentation, whenever a malfunction defense could be claimed. The commenter asserted that this will swamp EPA and state agencies with unnecessary paperwork, and for no clear benefit. The commenter further noted that, if EPA ultimately were to conduct a rulemaking to eliminate the excess emission provisions, despite the commenter's arguments for retaining them, there would be even more oral and written reports under the proposed affirmative defense. The commenter noted that the events covered by the excess emissions may occur often and, while they may last only a few minutes, a mill would have no way of knowing whether those incidents might later be part of an enforcement action, so the mill may feel compelled to report each of them under the affirmative defense notification.

Response: Commenter 0162 states that it was unclear where EPA found the legal authority in the CAA to shift the burden to the regulated community of proving (or disproving) essential elements of an alleged violation. As noted above, affirmative defense does not shift any burdens regarding burden of proof in a violation. The affirmative defense applies only where a violation has been established. Consequently, the burden of proof that a violation occurred remains with the plaintiff in an enforcement action. See, *e.g.,* §22.24. If a violation has been established and a source wishes to assert the affirmative defense with respect to penalties, only then does the source bear the burden of establishing that the elements of the affirmative defense have been met. This burden-shifting is appropriate because the source is in a better position to determine the facts required to establish the defense. See, *e.g., Arizona Pub. Serv. Co. v. EPA*, 562 F.3d 1116, 1120, 1129-30 (10th Cir. 2009) (rejecting industry challenge to EPA's use of an affirmative defense to address excess emissions during malfunction events.).

As discussed previously, the EPA has revised the immediate notification and 45-day malfunction report. The EPA has removed the requirements to notify the EPA within 2 days of violation of a standard and has allowed owners or operators to submit the affirmative defense report in the next periodic compliance, deviation report, or excess emission report. This should reduce the burden on the agencies and industry.

102. Comment: Injunctive Relief. Commenter 0168 noted that EPA does not allow facilities to assert an affirmative defense for the exceedance of an emission limit during malfunctions if EPA is seeking to enforce that emission limit through injunctive relief. The commenter said that the Agency apparently takes that position based on a memorandum, State Implementation Plans: Policy Regarding Excessive Emissions During Malfunctions, Startup, and Shutdown at 2 (Sept. 20, 1999). (SIP SSM Memo) The commenter asserted that this policy is wrong. The type of legal action or relief should have no bearing on the availability of this defense. A malfunction is not affected by the type of enforcement action that EPA may eventually bring. Indeed, because a malfunction is not reasonably preventable, enforcement actions, regardless of type, have no deterrent effect on them. Therefore, the type of legal action EPA uses to enforce a violation of its

emission limits is simply irrelevant to whether the violation should be excused because of circumstances beyond the facilities' control.

Consequently, commenter 0168 asserted that not allowing an affirmative defense in an action for injunctive relief is arbitrary and capricious. As the D.C. Circuit Court stated in *Essex Chem. Corp. v. Ruckelshaus*, 486 F.2d 427. 433 (D.C. Cir. 1973) a case reviewing a section 111 rule, the D.C. Circuit Court held that SSM provisions are "necessary to preserve the reasonableness of the standards as a whole." The D.C. Circuit Court of Appeals has also noted that "[a] technology-based standard discards its fundamental premise when it ignores the limits inherent in the technology." *NRDC v. EPA*, 859 F.2d 156, 208 (D.C. Cir. 1988). Therefore, EPA should not apply a policy drafted to "ensure that SIPs provide for attainment and maintenance of the national ambient air quality standards ("NAAQS") and protection of prevention of significant deterioration (PSD) increments" and other risk-based programs, SIP SSM Memo at 2, to the CAA section 129 technology-based program.

Response: EPA explained in detail its rationale for its approach to malfunctions in the preamble and in this RTC document. The EPA's rationale for applying affirmative defense to civil penalties but not to injunctive relief is to avoid replicating with affirmative defense the periods created by startup, shutdown, and malfunction exemptions; that is, periods of time when standards were unenforceable by the EPA or any concerned party because no enforcement remedy was available for excess emissions during such times. The EPA reminds the commenter that EPA must establish emission standards that "limit the quantity, rate, or concentration of emissions of air pollutants on a continuous basis." 42 U.S.C. 7602(k) (defining "emission limitation and emission standard"). See generally *Sierra Club v. EPA*, 551 F.3d 1019, 1021 (D.C. Cir. 2008) (emissions limitations under CAA section 112 must both continuously apply and meet section 112's minimum stringency requirements, even during periods of SSM). Thus, the EPA is required to ensure that section 112 emissions limitations are continuous and effectively enforceable. The affirmative defense for malfunction events meets this requirement by ensuring that, even where there is a malfunction and where a source successfully asserts an affirmative defense to civil penalties, the emission limitation is still continuous and enforceable.

6. Excess Emissions Allowances

103. Comment: Excess Emissions Provisions Must Be Removed. Commenter 0218 recommended that the EPA remove the "excess emissions provisions" for all parts of the pulp and paper source category, stating that exempting sources from compliance with emission standards at any time violates CAA section 112 and section 302, which makes clear that emission standards under section 112 must require continuous compliance. The commenter argued that the excess emissions allowance provisions are just as unlawful as the SSM exemption that the D.C. Circuit Court found to be unlawful, and for the same reasons. The commenter stated that:

- The provisions should require continuous control;
- The EPA should not consider any of the alternatives that still allow an exemption; and
- The EPA may not set an "alternative numerical emission limit" that would apply during times when "no control device is available" due to equipment or process "downtime," or some other problem in the system that is a malfunction.

The commenter noted that, as EPA's proposal makes clear that there is no evidence that the malfunctions, downtime, losses, damage, and other problems described could possibly qualify for a work practice standard under section 112(h)(4), the EPA must set a numerical emission standard "whenever it is feasible" to do so.

The commenter concluded that it may be necessary for sources to apply backup or secondary control devices, or detection or repair alerts, in order to prevent uncontrolled emissions. The commenter stated that the EPA had no lawful or rational basis for failing to remove all exemptions for "excess emissions" for this source category.

Response: We acknowledge the commenter's concern regarding excess emission allowances. We are deferring action on the excess emissions provisions and will consider the commenter's views as we continue to consider how to address these provisions.

104. Comment: Future Correspondence/Discussion. Commenter 0162 stated that, in addition to conducting the 8-year review of developments in control technologies under CAA section 112(d)(6) and the residual risk review under CAA section 112(f) for the pulp and paper category, EPA has indicated recently that it is considering eliminating or modifying the excess emission provisions in §§63.443(e) and 63.446(g) (See 76 FR 81346). The commenter contended that it would be improper and unlawful to do so. Moreover, EPA would need to publish a proposed rule for public comment before it could change the excess emission provisions.

The commenter appreciated EPA granting an extension until June 27, 2012 for commenters to provide information related to excess emission provisions.[155] The commenter said this time would be critical for NCASI to undertake the survey described in their letter to Robin

[155] See February 22, 2012 letter from EPA Assistant Administrator Gina McCarthy to AF&PA Vice President Paul Noe.

Dunkins of EPA.[156] Although the commenter could have deferred providing any information on this issue, the commenter shared their legal views and general observations about the need and use for the excess emissions provisions. The commenter stated they will provide additional comments on the subject before June 27, 2012.

The commenter stated that the pulp and paper industry was not aware of the potential for evaluation of the excess emissions allowances until approximately 1 month before the proposed rule was published. As such, there has been little coordination between the Agency and the commenter to discuss the justification for these provisions or the implications of changing them. Therefore, in addition to filing subsequent comments, the commenter would like to work with the Agency and set up meetings to discuss these issues, as they are complex, and an efficiency will be gained through coordination to assist the Agency in comprehension of these systems and their limitations and to develop realistic conclusions.

Response: We acknowledge the commenter's concern regarding the removal of the excess emission allowances. We further acknowledge and appreciate the commenter's efforts to provide information regarding the allowances. As noted above, we are deferring action on the allowances. We will consider this and other information received and will follow the proper regulatory procedures of proposing the changes, providing a public comment period, and promulgating a final rule.

105. Comment: Current Excess Emission Provisions Represent MACT and Were Included in the MACT Floor. Commenter 0162 stated that the excess emission provisions in the current subpart S rule reflect EPA's careful determination, after years of study of a large quantity of emissions information and public comments, that the MACT "floor," representing the emissions of the "best performers," includes emissions during unavoidable periods of releases of uncontrolled or partially-controlled pulping process vent gases and unavoidable sewering of untreated or partially-treated pulping process condensates (See 63 FR 18504, 18529 (April 15, 1998)). The commenter cited the 1998 FR notice, as follows:

> EPA established appropriate excess emission provisions to approximate the level of backup control that exists at the best-performing mills and the associated period of time during which no control device is available." *Id*. After "an analysis of the public comments and the available data regarding excess emissions and the level of backup control in the industry," EPA determined that the "best-performing mills achieve a one percent downtime in their LVHC system control devices" and "best-performing mills achieve a four percent downtime in the control devices used to reduce emissions from their HVLC system to account for flow balancing problems and unpredictable pressure changes inherent in HVLC control systems." *Id*. "The allowances address normal operating variations in the LVHC and HVLC system control devices for which the equipment is designed. The variations would not be considered startup, shutdown, or malfunction under the Part 63 General Provisions…." (See 63 FR 18530). The 10 percent excess emission provisions for steam strippers systems "accounts for stripper tray damage or plugging, efficiency losses in the stripper due to contamination of condensate

[156] See e-mail dated February 15, 2012 from Vipin Varma of NCASI to Robin Dunkins of EPA's Sector Policies and Programs Division.

with fiber or black liquor, steam supply downtime, and combustion control device downtime." *Id*.

The commenter noted that EPA adopted the excess emission provisions after reviewing extensive data from continuous monitoring systems and considering industry comments. Industry told EPA that, while some mills have backup combustion devices as part of their LVHC control system, venting of pulping gases is an essential safety practice (because of their explosion hazard). It is essential even for those systems with backup control devices, since the startup of, and transfer of vent gases to, the backup controls cannot be immediate or automatic for safety reasons, and operating variability in the control devices themselves is unavoidable for process and other reasons.[157] The commenter noted that, for HVLC systems, few mills had backup controls that could handle the large volume of vent gases, so any standard that required the use of backup devices would have been beyond the MACT "floor" and would not have been cost-effective due to the low concentration of pollutants in the large gas stream.[158]

In short, the commenter contended that the MACT determinations EPA made when promulgating the original subpart S emission standards correctly concluded that available technology involves unavoidable periods where not all vent gases or condensates can be routed to the control device, and/or when the control device is inoperable or necessarily operating at a reduced rate. The subpart S emission standards (including the excess emission provisions) were designed to reflect the performance of the MACT technology and the actual performance of the "best performing" mills. Without the excess emission provisions, the remainder of the subpart S emissions standards would impose limitations not achieved even by the "best performers" and not demonstrated as achievable at any facility. The commenter argued that this plainly is not what Congress intended.[159]

Response: We acknowledge the commenter's discussion of the development and use of the excess emission allowances. We also agree that the excess emission provisions were developed using extensive data during the promulgation of the original rule. We are deferring action regarding the excess emission allowances and will consider the commenter's discussion as we continue to consider how to address these provisions.

106. Comment: No Technical Justification for Eliminating Excess Emission Provisions. Commenter 0162 noted that EPA is supposedly carrying out Congress' directive in CAA section 112(d)(6) that, at least every 8 years, EPA review whether "developments in practices, processes, and control technologies" necessitate revision of MACT emissions standards. The commenter

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[157] See, *e.g.*, *Pulp, Paper and Paperboard Industry – Background Information for Promulgated Air Emission Standards – Final EIS*, EPA-453/R-93-050b (October 1997) ("BID") at 4-81, 4-82 to 4-84; AF&PA April 18, 1994 comments on the proposed MACT standards for Pulp and Paper Mills, p. MACT-61 (events resulting in venting of NCGs are "integral to process variability," and combustion devices will "predictably" not perform at their design efficiency "some small percentage of the time, even when they are being operated properly and all equipment is in order"); *id.* p. MACT-173-74.

[158] See 63 FR 18529; BID at 4-81 to 4-82; AF&PA April 18, 1994 comments at MACT-61 (degree of venting allowance needed is "independent of the availability of backup combustion devices because of the safety and engineering concerns"); *id.* at MACT-174 (backup combustion devices for HVLC systems could be an additional cost of $1 billion.

[159] See, *e.g.*, *Sierra Club v. EPA*, 353 F.3d 976, 980 (D.C. Cir. 2004); *Sierra Club v. EPA*, 167 F.3d 658, 665 (D.C. Cir. 1999).

stated that nothing has changed about the technology available to control volatile HAP emissions at pulp mills that eliminates the unavoidable excess emissions during the events that EPA accurately described when promulgating the current MACT standards. Absent such new technology, the commenter believes there is no statutory predicate for EPA to go back and change the MACT standards at this time.[160]

The commenter argued that even if the section 112(d)(6) technology review were an opportunity to second guess and revise the existing MACT standards, EPA has no technical basis for eliminating the subpart S excess emission provisions. The commenter stated that an agency cannot simply change its mind and reach a diametrically-opposed conclusion from the determination made in a prior rulemaking. Rather, EPA must demonstrate sufficient basis for changing its prior conclusions; in this case, technical justification for concluding that mills with MACT controls do not experience the unavoidable variability described by EPA in promulgating the subpart S rule and accommodated by the excess emission provisions.[161]

The commenter stated that there is no health or environmental imperative for eliminating the excess emission provisions in subpart S. The commenter noted that EPA has just completed its "residual risk" review and concluded that there is no significant risk from emissions (including excess emissions) allowed under subpart S. The commenter noted that the emissions data that EPA used in its risk modeling included emissions during bypassing of control equipment or other excess emissions covered by the subpart S excess emission provisions.

Similarly, commenter 0172 contended that it would be improper and unlawful for EPA to limit or eliminate the excess emissions allowances for LVHC, HVLC, and strippers. The commenter argued that EPA does not have the authority to modify or eliminate the excess emissions allowance provisions for pulp mill venting or steam strippers included in subpart S. These existing provisions were part of the MACT floor for this subcategory and cannot be modified without demonstrating that there have been "developments in practices, processes and control technologies" or that there is a change necessary to protect human health in a "residual risk" review. The commenter asserted that EPA has not made either demonstration.

Response: We acknowledge the commenters' concerns regarding the removal of the excess emission allowances. We are deferring action regarding the excess emission allowances and will consider the commenter's concerns as we continue to consider how to address these provisions.

107. Comment: Intervening Court Decisions Do Not Justify Eliminating Excess Emission Provisions. Commenter 0162 argued that intervening court decisions do not justify eliminating the excess emission provisions. The subpart S NESHAP was never judicially challenged, and the time for such a challenge under CAA section 307(b) has long passed. Even if there were some portion of an opinion in one of the many cases challenging other NESHAPs that was contrary to the approach EPA took in promulgating subpart S, that would not provide a means nor a

[160] Cf. *NRDC v. EPA*, 529 F.3d 1077, 1084 (D.C. Cir. 2008) (rejecting contention that CAA section 112(d)(6) requires EPA to "start from scratch" and develop new MACT standards).

[161] See, *e.g.*, *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 129 S. Ct. 1800, 1811 (2009) ("a reasoned explanation is needed for disregarding facts and circumstances that underlay…the prior policy"); *Transactive Corp. v. United States*, 91 F.3d 232, 237 (D.C. Cir. 1996).

justification for reopening subpart S standards that were never challenged on that grounds.[162] Regardless, the commenter contended that none of the holdings in other cases undercuts inclusion of the excess emission provisions in subpart S.

The commenter acknowledged that EPA may believe that elimination of the excess emission provisions is justified or required by the D.C. Circuit Court's decision in *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008), *cert. denied*, 130 S. Ct. 1735 (2010), which vacated the "exemption" for excess emissions during SSM events contained in the 40 CFR part 63, subpart A GP. The commenter noted EPA's suggestion that the excess emission provisions are "arguably at odds with" that decision (See 76 FR 81346). To the contrary, the commenter believes the D.C. Circuit Court's *Sierra Club* decision is not inconsistent with, and would not justify EPA's retroactive elimination of, the subpart S excess emission provisions. The commenter provided three reasons in support of their position:

- First, the *Sierra Club* decision interpreted the NESHAPs GP, not the subpart S NESHAP or indeed any categorical NESHAPs.

- Second, the decision addressed an exemption for startups, shutdowns, and malfunctions, while the subpart S excess emission provisions for pulping vent gases specifically does not address excess emissions during SSM (see §63.443(e)), and the provision for pulping condensates only covers such events because EPA did not have data to distinguish those situations from "normal stripper operating emissions" (see 72 FR 18529-30).

- Third, the *Sierra Club* decision rejected the GP's blanket, open-ended exemption for emissions during SSM periods, finding it to be inconsistent with Congress's intention that "there must be continuous section 112-compliant standards" for sources subject to MACT standards, rather than periods where no standard of any kind applies. See 551 F.3d at 1027. The problem with the GP SSM exemption, in the D.C. Circuit Court's eyes, was that it allowed sources to be exempt from any standard at all, and that it was not derived (by EPA's admission) applying the factors in CAA section 112(d) or 112(h). See *id.* at 1027-28, 1030. The *Sierra Club* opinion did not address a situation, such as the subpart S standards, where EPA finds that the MACT standard, which applies continuously, must account for periods of higher emissions during unavoidable operational variability to accurately reflect the available technology and the best performers' emissions.[163]

Response: We acknowledge the commenter's views concerning the application of the D.C. Circuit Court's decision in *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008) to the

[162] See *id.* and, *e.g.*, *Sierra Club v. EPA*, 353 F. 3d at 986 (MACT standards judged on the adequacy of EPA's explanation in the particular rulemaking, not on what EPA did based on a different record in a different rulemaking).
[163] See BID at p. 1-41 ("*EPA established excess emission allowances to approximate the level of downtime and number of backup control devices that exist at the best-performing mills. The Excess emissions allowances are designed to account for periods when the control device is inoperable and when the operating parameter values established during the initial performance test cannot be maintained due to problems with the process.*"). Thus, the commenter contended that EPA's statement, in the preamble to the proposed rule, that the excess emission provisions of the current regulations "create time periods during which a source does not have to comply with a CAA section 112-compliant standard" (see 76 FR 81 346) is simply contrary to the record for the existing Subpart S rulemaking.

excess emissions provisions. As we have noted above, we are deferring action on the excess emissions provisions and will consider the commenter's views as we continue to consider how to address these provisions.

108. Comment: Provisions Are Consistent with CAA. According to commenter 0162, EPA lacks authority to go back and re-assess the existing MACT standards for reasons unrelated to CAA sections 112(d)(6) and 112(f). But even if EPA did have authority, the commenter argued that the excess emission provisions in the existing subpart S regulations are entirely consistent with the CAA and with past EPA practice. The commenter stated that the excess emissions provisions represent the performance of the best-performing mills. The commenter stated that without the excess emission provisions, the subpart S standards would violate CAA section 112 because section 112(d) standards are supposed to represent "the emissions control that is achieved in practice" by the best performers, which means that the best-perfoming mills would not violate the standards, which "only results if 'achieved in practice' is interpreted to mean 'achieved under the worst foreseeable circumstances.'" *Sierra Club v. EPA*, 167 F.3d 658, 665 (D.C. Cir. 1999). The courts (and EPA) have recognized that there is variability in the performance of control technologies, which needs to be accounted for in establishing emission limitations based on the MACT floor. See, *e.g.*, *Cement Kiln Recycling Coalition v. EPA*, 255 F.3d 855, 862-865 (D.C.Cir.2001). As the record reflects, it is certainly foreseeable that even the best performers would experience violations of the MACT standards, due to process variability and control technology limitations, without an excess emission allowance.

According to the commenter, EPA has implied that the excess emission provisions in the existing subpart S regulations somehow are inconsistent with the D.C. Circuit Court's vacatur of the NESHAP GP SSM exemption because they do not provide a numerical limitation on emissions during certain periods (See 76 FR 81346). However, according to the commenter, nothing in *Sierra Club v. EPA* said that MACT standards have to be the same at all times; to the contrary, the Court recognized that they might not be. See 551 F.3d at 1021, 1027.

The commenter stated that the excess emission allowances are no different in principle from the averaging periods that EPA applies almost universally in setting the MACT standards: a source complies with the average emission limitation even though there are times during the averaging period when the source's emissions are much higher than the rate specified in the standard. Also, EPA has included excess emission provisions analogous to those in subpart S in NSPS issued under CAA section 111, even though the same definition of "emission limitation" and "emission standard" (relating to limiting emissions of air pollutants on a continuous basis) applies to NSPS. For example, in the NSPS for Kraft pulp mills, EPA recognized the complex factors affecting recovery furnace operations and provided an excess emission allowance (§60.284(e)), in addition to the SSM provision in §60.8(c).

The commenter stated that, in effect, elimination of the excess emission provisions would put pulp and paper mills in a "Catch-22" situation: the MACT standards would no longer accommodate the excess emissions that EPA knows will occur regularly during normal mill operations, as a result of process variability and control equipment operations and availability. Yet those same events would appear to be ineligible for the "affirmative defense" that EPA proposes as a means of addressing excess emissions that occur despite a source's proper design and operation, since the "affirmative defense" is only available for excess emissions that result

from unforseeable and infrequent events (see proposed §63.456(a)). This would be unreasonable, arbitrary and capricious, and not in any way required by the CAA or judicial precedent.

Response: We acknowledge the commenter's views concerning the excess emissions provisions. As we have noted above, we are deferring action on the excess emissions provisions, and will consider the commenter's views as we continue to consider how to address these provisions.

109. Comment: Excess Emission Provisions Necessary Due to Inherent Process Variability, Design, and Technology Reasons. Commenter 0162 stated that the excess emissions provisions are necessary to accommodate inherent process variability, design, and technology features. Provisions for a small amount of LVHC and HVLC system venting and stripper downtime were developed as part of the MACT "floor," based on the fact that even the best-performing units could not meet the standards at all times. As the technology for the collection and treatment of HAPs under subpart S has not changed, neither has the capability for mills to operate without needing these provisions. These provisions are necessary due to process variability and not for situations defined as SSM. These events generally are not due to situations where some equipment has broken down and must be repaired to correct the situation, but are due to process variability and safety interlocks which have caused a situation that requires a release.

Commenter 0172 explained that vent gas collection systems are built to collect emissions from process equipment and to route these emissions to a single control device for destruction. Examples under subpart S include collection of vent gases from digester systems (which are commonly composed of multiple batch digesters), evaporator trains (some mills have more than one), condensate collection tanks, turpentine recovery systems, stripper feed tanks, and heat recovery systems. The collected gases from these systems are routed to an incineration device (typically a stand-alone incinerator, lime kiln or boiler) for destruction. This incinerator may be located a considerable distance from the process equipment and, thus, very long piping runs are involved. In order to protect the system, safety release vents are built into the piping system to protect it from over- (or under-) pressure spikes from the process equipment. These devices are referred to as pressure/vacuum (PV) valves and rupture disks.

According to commenter 0172, even at the best performing mills, at all times during periods of SSM, the process equipment may be subject to over-pressure or high-temperature spikes. Furthermore, given the complexity of these systems and the sources they control, there may be normal operating periods where process variability creates a momentary pressure or temperature fluctuation. These pressure/temperature spikes need to be relieved by releasing to the atmosphere immediately through the PV valves close to the process equipment to prevent damage to the piping system. Opening a vent valve at the control device (which may be located a long distance from the process equipment) does not provide sufficient protection for the piping system. The EPA must retain the excess venting allowance for these situations to avoid unfairly penalizing facilities for safety-related venting to protect key process equipment.

Commenter 0172 stated that EPA must recognize that the venting allowance applies to the vent collection system as well as the final control device. The EPA has stated that the venting allowance applies only from the system as a whole and not from individual sources and that the control device must be inoperative for the gas stream to legitimately bypass the control

system.[164] However, as described above, to protect vital equipment, there are normal operational situations requiring venting of gases immediately in the closed-vent collection system near the process equipment, which may be located far from the control device. Even if it were possible to vent at the control device in such instances, EPA's interpretation that the venting allowance is applicable only if the control device is inoperative is not appropriate given the complex nature of the closed-vent collection system. The most obvious solution, and the one that minimizes emissions to the maximum extent possible, would be to recognize the safety and technical need for localized pressure relief by allowing venting (subject to the 1 percent/4 percent allowance) anywhere within the closed-vent collection system where safety-related venting is required, while maintaining normal operation of the final control device to control emissions from all the other process equipment in the system.

Commenter 0172 stated that venting from LVHC and HVLC systems can occur as a result of normal process variability not associated with startups, shutdowns, or malfunctions in pulp mill process equipment, closed-vent collection systems, or vent gas control equipment. The 1 percent/4 percent venting allowance is necessary to protect mills from enforcement exposure during these normal events. One example of this variability is a sudden change in the steam system pressure, which can be caused by sudden shutdown of process equipment outside the pulp mill (such as a paper machine) or an operational problem with one of the boilers themselves (such as interruption of fuel flow to a power boiler or loss of black liquor to a recovery furnace). This sudden spike or reduction of steam pressure could cause two problems resulting in venting from the closed vent control system or at the final control device:

- Steam eductors in the vent gas control system would not maintain sufficient vacuum in the closed vent control system, causing an overpressure situation which would cause the PV valves to open.
- This sudden change in steam header pressure could cause operational problems in pulp mill equipment such as an evaporator system. The sudden pressure change could cause the evaporator to "carry over" black liquor from one of the effects into the vapor space of the unit, creating an unstable operating condition, with the likelihood of LVHC gas venting due to overpressure.

Commenter 0172 contended that it is impractical and/or unreasonably expensive to completely eliminate LVHC and HVLC venting due to the safety considerations and process variability. Therefore, at a minimum, EPA must retain the 1 percent/4 percent venting allowance to cover these situations. Without the venting allowances, mills would need to eliminate all venting not related to safety or normal variability. For a mill to completely eliminate all the other vents would require extraordinarily costly process modifications. Following are some examples of these process modifications:

- Full engineering analysis of the process equipment, vent gas collection system and final control devices. It is anticipated that significant capital would be required to make these systems completely vent-free (such as "bumpless transfer" between control devices).
- Even though mills presently have backup systems for LVHC incineration, many are not kept in a "hot" condition and, thus, are subject to a waiting period before being available for burning of LVHC gasses. To keep backup control devices in a "hot" mode would

[164] See EPA Region 9 Applicability Determination M990012 (September 30, 1999).

involve extra operating costs. Some existing backup control devices are not 100 percent reliable and mills would have to install a third backup.

- As noted above, HVLC systems at many mills do not have backup incineration sources. Without the venting allowance, these facilities would need to install a backup control device and, to be 100 percent reliable, perhaps even a third backup.

Response: We appreciate the information provided by the commenter regarding the excess emission allowances. As we have noted above, we are deferring action on the excess emissions provisions and will consider the commenter's information as we continue to consider how to address these provisions.

110. Comment: Commenter 0228 requested that EPA maintain the 1 percent and 4 percent vent allowances. These limits reflect the reality that, given the complexity of the NCG collection systems, vents are inevitable. Collection systems in pulp and paper mills are effective at capturing gases generated at various points within the process, preventing those gases from becoming explosion hazards, and delivering gases to combustion units. Unplanned events such as combustion unit shutdowns, pressure changes within the system, flame arrester pluggages, or valve malfunctions occur at even the best-controlled mills. Due to the unpleasant odor of NCG gases and the impacts of that odor within the mill and local communities, facilities do not generally vent unless there is some kind of operational or safety-related event that makes venting necessary to prevent damage to equipment and/or maintain a safe working environment.

The commenter has regulated the release of NCGs since the early 1990s (see Maine Department of Environmental Protection Rule 06-096 CMR 124, "Total Reduced Sulfur Control from Kraft Pulp Mills"). An important part of that regulation limits individual LVHC gas release events to 40 minutes. The restricted duration of individual LVHC gas events discourages mills from venting for long periods of time and reduces the likelihood that mills will ultimately exceed the 1 percent quarterly limit on LVHC gas vents required under subpart S. The combination of the 40 minute individual event limit and 1 percent quarterly limit has proven to be an effective and practical method of limiting LVHC emissions. The commenter suggested that EPA consider such a duration limit for individual LVHC events. As opposed to considering every vent a potential violation, the 40-minute limit combined with the 1 percent quarterly aggregate limit would reduce the number of affirmative defense cases submitted by affected facilities.

Response: We appreciate the information provided by the commenter regarding the excess emission allowances. We are deferring action regarding the excess emission allowances and will consider this information as we continue to consider how to address these provisions.

111. Comment: Information Requested by EPA on Releases

Emissions Estimates. Commenter 0162 noted that EPA requested information on the estimated emissions that occur during periods covered by the excess emission provisions. The commenter stated that it is not possible to quantify emissions on a site- or event- specific basis. The commenter is not aware of any successful measurements of releases from vents during a release. The commenter explained that emissions will vary based on the cause, location, and source of the release. Emissions will vary not only between mills and sources but between the same sources at the same mill under different circumstances. The commenter noted that NCASI

has developed limited data sets for main vents (vents immediately prior to the control device that include gases from all collected sources) under normal operations. However, site-specific data cannot be collected for the releases listed above, as the events cannot be anticipated, the events are typically short in duration, and it is unsafe to perform sampling. The commenter stated that the reasons EPA gave for not setting emission limits in the original standards have not changed:

> At proposal EPA did not have sufficient data to establish a mass emission limit or a mass emission reduction percentage across each mill. Since proposal [in 1993], EPA obtained site-specific information that was used to develop emission factors for various systems at a mill. However, these emission factors represent average or typical systems and are not specific to each mill. While EPA believes such information may be used to estimate national impacts, it is not adequate to determine the MACT floor level of control (*i.e.*, the factors are not representative of the actual emissions at each mill but may be used to represent typical emissions from all mills). Actual mass emission levels or mass emission reductions would still be required. Information on the controls for various systems at each mill was available to EPA. Therefore, EPA decided to develop MACT floors on a unit (*i.e.*, system) basis.[165]

The commenter noted that estimating total source category emissions associated with the excess emission provisions is very difficult, for the same reasons. The commenter stated that, during the extended comment period that EPA has allowed for comment on the excess emission provisions of the subpart S standards, AF&PA, NCASI, and industry representatives will be exploring ways in which the industry might respond to EPA's request for emission estimates.

Work Practices Currently Employed. Commenter 0162 stated that mills were required to develop SSM plans under subpart S, and that mills use these plans and standard operating procedures to define the work practices mills must follow to minimize emissions during a release.

Procedures To Monitor Releases. Commenter 0162 stated that, depending on the process and system design, mills monitor the location and time of releases by pressure (most popular), valve position, temperature at the vent location or flow meters. Facilities record this information either electronically or in log books and report events as currently required under subpart S.

Ventless Transfer Systems. Commenter 0162 stated that some systems can be designed for ventless transfer between the primary and backup control device; however, these systems cannot prevent venting 100 percent of the time. The commenter noted that these systems would only experience ventless transfer if all the conditions are met such that the interlocks do not prevent introduction of the gases to the alternate treatment device. However, some units cannot be designed for ventless transfer. Examples include:

- Systems with recovery furnaces, to assure that the burner is not plugged. Light-off of the igniter must be initiated at the burner front, and then only after inspecting the burner opening in the furnace wall to ensure that there is no plugging.

[165] See EPA-453/R-93/050b, October 1997, page 4-6.

- Systems that have different types of boilers as the Primary and Backup Control Devices (*i.e.*, one boiler is under positive pressure, and the other boiler is under negative pressure).
- Systems such as oxidizers that were installed as Backup Control Only (these units are typically not maintained in a "hot" state to immediately accept gases to minimize fuel burning and emissions, and for energy conservation).

Response: We appreciate the information provided by the commenter regarding the excess emission allowances, SSM plans, procedures to monitor releases, and ventless transfers. We are deferring action regarding the excess emission allowances and will consider this information as we continue to consider how to address these provisions.

112. Comment: Responses to EPA's Questions on Provision Options

Work Practice Justification. As noted above, the commenter contended that the excess emission provisions should be maintained in the rule because the provisions are necessary for technological reasons, due to system design for safety and process operating variability–not due to a desire to avoid penalty for excess emissions during periods of SSM. The commenter asserted that EPA must propose a new rule and allow for comment prior to revision of the standard. Although the commenter disagreed that a change to the provision is required, the commenter asserted that the only acceptable alternative is a work practice. The commenter pointed out that the CAA states "if it is not feasible in the judgment of the Administrator to prescribe or enforce an emission standard for control of a hazardous air pollutant or pollutants, the Administrator may, in lieu thereof, promulgate a design, equipment, work practice, or operational standard, or combination thereof."[166] In order for an emission standard to be infeasible, the Administrator must determine that "the application of measurement methodology to a particular class of sources is not practicable due to technological and economic limitations.[167]

Technological Limitations. Commenter 0162 stated that development of a numerical emissions standard (other than tracking vent time) is not feasible due to technology limitations. The commenter stated that there are no data available to quantify site-specific emissions from the vents of LVHC and HVLC systems. In addition, the emissions impact of stripper downtime is not clearly understood, as condensates would generally be sewered to the wastewater treatment system. The commenter noted that there may be unknown losses to the air from any sewers that are open to the atmosphere prior to introduction to the biological treatment system.

The commenter stated that, even if time were allowed to collect additional data, it is not possible to measure the emissions from excess emissions events, because the exact time and location of the event cannot be anticipated and the events are generally short in duration. In addition, collection of these gases is not always possible, as the locations are not always accessible and sampling of NCG gases outside the collection system would be dangerous. For these reasons, there is not sufficient data available to develop a numerical emission standard.

[166] See CAA section 112(h)(1).
[167] See CAA section 112(h)(2)(B).

Economic Limitations. Commenter 0162 stated that if EPA were to eliminate the excess emission provisions, mills would need to install duplicate systems for collection and treatment of both NCG gases and condensates. This includes:

- Installing equipment to send HVLC gases to a backup control device (assuming the facility has an available control device that can be used as a backup),
- Installing redundant HVLC and LVHC gas collection systems, and/or
- Installing backup steam strippers.

The commenter estimated that the costs to install these systems is $1.6 billion, which is cost-prohibitive and unnecessary, given that EPA has determined that the risks associated with the current rule, which included emissions during venting, are acceptable. The commenter noted that, even with these installations, there is no guarantee that a mill would be able to prevent all incidents of stripper downtime and/or venting due to process variability and safety concerns. The commenter provided the breakout of their cost estimate in Table 10 below and included additional details in Attachment 5 of their comment (0162).

Table 10. Capital Cost Estimate for Redundant Systems (Submitted by Commenter 0162)

System	Capital cost
HVLC Redundant Control Costs	$ 500 M
Redundant LVHC/HVLC Collection Systems	$ 700 M
Backup Strippers	$ 400 M
TOTAL	**$ 1.6 B**

Response: We appreciate the information provided by the commenter regarding a justification for replacing the excess emission allowances with a work practice (if necessary) and the technological and economic limitations associated with other regulatory approaches. We are deferring action regarding the excess emission allowances and will consider this information as we continue to consider how to address these provisions.

113 Comment: Several other commenters (0163, 0167, 0170, 0207, and 0212) were also opposed to elimination of venting and stripper downtime allowances, and provided similar arguments to those presented above.

Commenter 0163 opposed removal of the excess emissions allowances because they are necessary for the safe and orderly operation of mill processes and were included as part of the original MACT floor and are reflective of the best-performing mills. The commenter noted that EPA proposed in the December 27, 2011 rulemaking to remove language that excludes SSM events from the LVHC and HVLC allowances and includes such SSM events in the steam stripper venting allowance. The commenter opposed these changes until such time that EPA receives and adequately evaluates the information that it has requested concerning industry and state practices. The commenter stated that they have not had enough time to evaluate and prepare responses to the information requests concerning the allowances. The commenter understood from NCASI that EPA will accept this information until June 27, 2012.

Commenter 0167 stated that emission allowances represent the MACT floor determination and are necessary to account for emissions during unavoidable periods of releases

of uncontrolled or partially uncontrolled pulping process vent gases and unavoidable sewering of untreated or partially untreated pulping process condensates. Without the emission allowances, the remainder of the subpart S emission standards would impose limitations not achievable by the best performers and not demonstrated at any facility. The commenter stated that the EPA has provided no technical justification for eliminating these allowances. The commenter stated that the EPA has the obligation to evaluate the residual risk from individual MACT categories, as well as identify any technology improvement, and the EPA does not provide any justification from either.

Commenter 0170 stated that elimination of vent and downtime allowances, as considered in the proposal, would make process gas destruction requirements unachievable, even with construction of new redundant control systems at great cost and little benefit, during periods when venting to the atmosphere is necessitated in order to comply with insurance and process safety codes, to protect equipment and to ensure a safe work environment for employees.

Commenter 0207 stated that a limited amount of venting of NCGs consisting of LVHC and HVLC streams must take place in the course of daily operations, as well as in startup and shutdown of processes. These short periods of excess emissions are not "malfunctions" in any real sense. They are part of the design and proper operation of the equipment covered under the rule. The commenter stated that facilities should not have to resort to defending these unavoidable events from enforcement. The commenter stated that allowances for some excess emissions are necessary for safe, efficient, and environmentally responsible operation of the array of equipment employed for HAP collection and control. These systems are closely integrated into complex pulping and combustion operations.

Commenter 0207 stated that the EPA has presented no evidence demonstrating that limited venting results in increased health risks or environmental impacts. The commenter contended that the Agency has not justified the need for their company and others to spend enormous amounts of money to install backup, redundant or "upgraded" equipment to reduce venting further. The commenter urged the EPA to retain the subpart S venting allowances. The commenter stated that if the Agency wanted to revisit venting of LVHCs and HVLCs, it should examine the data the industry's mills submitted as part of their quarterly or semiannual compliance reports, as well as any other pertinent information the industry can supply before the rule is finalized. The commenter contended that the data would support the company's position that some venting is necessary and acceptable. The final version of the rule should provide adequate venting allowances for control equipment and for limited venting during startup and shutdown of some processes. Many such events do not meet the common-sense definition of "malfunction."

Response: We appreciate the commenters' concerns regarding the removal of the excess emission allowances. We are deferring action regarding the excess emission allowances and will consider these concerns as we continue to consider how to address these provisions. With respect to the comments summarized above concerning SSM periods, the EPA views the amendments to remove the SSM exemption (through corrections to General Provisions references) as a separate issue from how to address the excess emissions allowances and is proceeding with removal of the SSM exemption.

6.1 LVHC Systems (1 Percent)

114. Comment: Commenter 0162 stated that LVHC NCG gases are potentially explosive and cannot be burned safely without supplemental fuel. Most mills have both a primary and backup control device[168] for the treatment of LVHC gases. These gases must be incinerated with support fuel and be interlocked to failsafe on loss of support fuel, combustion air, and/or boiler load. The flame safety system will not permit the gases to be admitted until the burner is operating on supplemental fuel and ignition is proven. Therefore, for gases to be introduced into any control device, several conditions, also known as permissives, must be met and the system has a series of interlocks that will not allow the introduction of gases unless all conditions are satisfied. These conditions are required for both safety and protection of process equipment. The safety interlocks are required by both Factory Mutual Insurance and the National Fire Protection Association for burning of these non-condensable gases. Also, when these gases are burned in a recovery furnace, there are safety guidelines issued by the Black Liquor Recovery Advisory Committee. Depending on the control device, the system may have anywhere from nine to fifteen interlocks.

The commenter stated that the most common cause of an LVHC release is due to the loss of a flame or burner permissive for the control device. These events are typically short in duration and the situation quickly resolves itself. An example is an intermittent loss of burner in the destruction device due to loss of flame or flame scanner detection temporarily during cleaning of oil gun(s) on oil fired unit. Safe destruction of LVHC gases requires the presence of a burner in the destruction device for safety reasons to assure combustion of the gases. In most cases, the permissive allows a return to normal operation in less than five minutes. In cases where this does not occur, the mill would try to transfer treatment of the gases to the backup control device.

The commenter stated that, in situations where the backup control device is not immediately available (*i.e.*, due to maintenance, the backup system is not "hot", *etc.*), the mill must analyze the situation and decide how to minimize emissions. If the mill anticipates the permissive will allow a return to normal operation in a reasonable amount of time, the facility will continue to operate rather than to implement an emergency shutdown that could result in higher emissions. If this is not the case, the mill will shutdown the subpart S sources. Most states recognize this situation in that they allow facilities to run for a period of 1 – 4 hours (depending on the state) with the control device down before requiring notification and corrective action. The commenter provided the following examples of events that can cause the isolation of the destruction device and venting of the LVHC NCG stream:

- Low steam supply pressure to the inductor, or
- Low steam flow to the inductor, or
- Low inductor outlet NCG flow, or
- Low inductor inlet vacuum, or
- High temperature downstream of inductor (flashback), or
- NCG nozzle pressure is inadequate (ensures proper furnace penetration), or
- Loss of main NCG header rupture disc, or

[168] Common control devices for LVHC gases include power boilers, lime kilns, stand-alone thermal oxidizers, and recovery furnaces.

- A pressure instrument detects a high pressure event, or
- Main vent or double block and bleed valve vent valve not showing closed by limit switch, or
- Main auxiliary-fuel valve failure to open, or
- Loss of destruction device BMS permissive, or
- Low destruction device temperature, or
- Dedicated destruction devices:
  - Loss of quencher permissives
  - Loss of scrubber permissives
  - Incinerator—quencher outlet temperature high-high alarm
- Any other condition relating to the safe operation of a destruction device

Another cause of unplanned releases is process variation. During these events, there is a vent at the process source until the operator or process logic control system can verify that there has not been an explosion in the system and the permissives will allow collection of the vent. In these situations, the system is operating within its design parameters and repairs are not necessary. An example is a paper machine trip which causes a domino effect throughout the mill (*i.e.*, the machine trip causes a swing in the steam header pressure which results in over pressurization at the pulping equipment and a vent to open to relieve the pressure and prevent an explosion). The NCG system (LVHC or HVLC) will also automatically vent gases to atmosphere for any of the following process reasons associated with collection of individual sources which also typically cause the collection system main vent location to open by-passing the control device: high temperature, high pressure, or bypass rupture disc ruptured.

Response: We appreciate the commenters's information regarding the excess emission allowances for LVHC systems. We are deferring action regarding the excess emission allowances and will consider this information as we continue to consider how to address these provisions

6.2 HVLC Systems (4 Percent)

115. Comment: Commenter 0172 noted that when subpart S was promulgated in 1998, EPA recognized that existing HVLC systems in the industry did not have backup control devices and, therefore, established a 4 percent venting allowance for those times when the sole control device was shut down for maintenance. Stated differently, backup control for HVLC systems was not part of the MACT floor. The commenter contended that this is still true today, as most mills have not installed backup HVLC controls. As previously noted, the floor cannot be modified without demonstrating there have been "developments in practices, processes and control technologies." If EPA were to eliminate the 4 percent HVLC venting allowance, this would be a *de facto* mandate for mills to install a backup control device to be in continuous compliance with the new standard (*i.e.*, continuous collection and destruction without an excess emission allowance). The EPA has not conducted a beyond-the-floor analysis to justify this approach.

Commenter 0162 stated that the HVLC system is similar to the LVHC system in causes of venting events.[169] The commenter explained that the main difference is that most HVLC systems do not have backup control devices. Therefore, when the permissive prevents treatment of the gases, the mill must decide if emissions will be best minimized by waiting for the control device to become available or shutting down the HVLC sources. The commenter provided the following examples of events that can cause the isolation of the destruction device and venting of the HVLC NCG stream:

- Loss of HVLC fan, or
- Low HVLC fan outlet flow, or
- Low HVLC fan inlet vacuum, or
- High temperature downstream of HVLC fan (flashback), or
- Loss of main NCG header rupture disc, or
- A pressure instrument detects a high-pressure event, or
- HVLC vent valve not showing closed by limit switch, or
- Loss of destruction device burner management system permissive, or
- Low destruction device temperature, or
- Any other condition relating to the safe operation of a destruction device.

Commenter 0162 stated that EPA recognized that most of the MACT "floor" mills controlling HVLC sources did not have backup control devices, and, therefore, EPA provided for a longer excess emission provision under the rule. The commenter noted that, due to the volume of HVLC gases, the control options are typically limited to either a stand-alone incinerator, power boiler, or recovery furnace, and the gases are injected as combustion air.

Response: We appreciate the information provided by the commenters regarding the excess emission allowances for HVLC systems. We are deferring action regarding the excess emission allowances and will consider this information as we continue to consider how to address these provisions.

6.3 Steam Stripper Systems (10 Percent)

116. Comment: Commenter 0172 stated that a steam stripper excess emission allowance is essential for pulp mill process equipment. As with control devices for HVLC systems described above, when subpart S was promulgated EPA recognized that steam strippers, even at the best performing sources, required periodic routine maintenance. Because backup condensate treatment was not considered as part of the MACT floor at these facilities, EPA established a 10 percent excess emission allowance to cover periods of required maintenance. Should EPA eliminate this allowance, facilities would be required to install a backup system to treat process condensates when the steam stripper was shut down for routine maintenance. The only options for backup control would be to install a new stripper (the commenter cited EPA's estimate of $5.3 million for a new stripper) or hardpipe condensates to the wastewater treatment system. In addition to the cost of installing the necessary piping systems, hardpiping may not be feasible at

[169] "The best-performing mills achieve a four percent downtime in the control devices used to reduce emissions from their HVLC system to account for flow balancing problems and unpredictable pressure changes inherent in HVLC systems" (See 63 FR Vol. 72 at 18529 (April 15, 1998))

all waste treatment plants without significant capital expense to improve aeration capacity or even enlarge the footprint of the system. As with HVLC systems, EPA has not done a beyond-the-floor analysis to justify this approach.

Commenter 0162 stated that, under the existing MACT standards for both steam strippers and stand-alone biological treatment systems that treat only condensates, periods of excess emissions are not violations, provided that such periods do not exceed 10 percent of the total process operating time in a semi-annual reporting period. (See §63.446(g).) This provision was included in the current rule because the MACT "floor" mills did not have backup control devices and could not treat condensates at all times.[170] The 10 percent excess emission allowance includes SSM events, and the commenter asserted that it should continue to include SSM events because there is no backup for these systems. These systems require maintenance, and when there are problems with their operation, the systems can require significant work to get them back to serviceable condition.

Response: We appreciate the information provided by the commenters regarding the excess emission allowances for steam strippers. We are deferring action regarding the excess emission allowances and will consider this information as we continue to consider how to address these provisions.

[170] "The appropriate excess emissions allowance for steam stripper systems was determined to be 10 percent. The provision accounts for stripper tray damage or plugging, efficiency losses in the stripper due to contamination of condensate with fiber or black liquor, steam supply downtime, and combustion control device downtime. This downtime provision includes all periods when the stripper systems are inoperable including scheduled maintenance, malfunctions, startups, and shutdowns." (See 63 FR 18530 (April 15, 1998)).

7. Testing and Monitoring

117. Comment: Commenters 0162 and 0207 objected to the proposed new revision in §63.457(o), which states that performance tests shall be conducted under "such conditions as the Administrator specifies to the owner or operator based on representative performance of the affected source for the period being tested. Upon request, the owner or operator shall make available to the Administrator such records as may be necessary to determine the conditions of performance tests." The commenters argued that, depending on what "conditions" the Administrator specifies, it may be impossible to conduct performance testing in the time frame required, while simultaneously meeting all the conditions the Administrator or her designee may specify. The commenters stated that this new provision makes it unnecessarily difficult to develop testing protocols and successfully conduct performance tests.

According to the commenters, performance tests should be conducted under normal operating conditions, taking into account real-world constraints and considerations. To illustrate this argument, commenter 0162 noted that the actual load or capacity to which any digester, pulp washing line, or bleach plant (and their supporting steam stripper or wastewater treatment plant) can operate depends on the capacities of tanks holding pulp and the demand for pulp from pulp and paper machines (unless the pulp is discharged to the sewer, a highly undesirable outcome). According to the commenters, a number of other short-term process fluctuations and unplanned events can have an impact on pulp production and supporting operations.

The commenters stated that mills provide stack test notice 60 days in advance and plan for stack tests in good faith to run under conditions that represent normal operation. The commenters noted that normal operation includes many load conditions and load mixes at mills with multiple lines. The commenters concluded that the rule should simply require that performance tests be conducted under normal operating conditions.

The commenters noted that special conditions and alternative operating scenarios (such as running only one scrubber in a series of two scrubbers) are addressed in part 70 operating permits, which also address the compliance demonstration requirements for these scenarios.

Response: We do not agree that these requirements make it impossible to conduct the performance test or unnecessarily difficult to develop the test protocol. The language specifying the conditions under which the performance tests are to be conducted is typical of those conditions specified for many processes and control measures, which can vary greatly. The Agency understands that some processes may present unique challenges in specifying a narrow range of process conditions and control device operating conditions under which the performance test must be performed. However, this does not preclude the facility from providing to the regulatory authority in the test protocol or test plan the range of operating conditions and control device conditions which they expect to exist at the time of the performance test. By having facilities provide the expected test conditions and supporting rationale that these conditions are representative of the facility's emissions performance, the regulatory authority can

determine whether these conditions are acceptable and consistent with the intent of the rule and the EPA's CAA national stack testing guidance.[171]

7.1 Repeat Testing

118. Comment: Commenter 0162 did not object to the proposal requiring performance testing once every 5 years for facilities that comply with standards in §63.446 using steam strippers. The commenter noted that facilities that use strippers are currently required to conduct an IPT and then monitor surrogate parameters against limits developed during the IPT. While the commenter noted that strippers are efficient systems when properly operated and maintained and believes that monitoring surrogate parameters is appropriate to indicate continuing stripper removal efficiency, the commenter did not object to EPA's proposal to require performance testing every 5 years, noting that this would provide additional compliance documentation.

Response: The EPA proposed 5-year repeat testing for stripper off–gases, which are part of the LVHC system by definition. The EPA did not propose, and, therefore, is not promulgating regulatory language requiring repeat performance testing for process liquids in this action. However, EPA is considering whether to propose repeat process liquid testing for steam strippers in a future action addressing the excess emissions allowances as a result of the comments received stating that steam stripper performance can degrade over time.

119. Comment: Three commenters (0162, 0163, and 0172) agreed with EPA's decision not to propose additional emissions testing for facilities that comply with the CCA approach, due to the complexity and difficulty of these compliance demonstrations (76 FR 81347). Commenter 0162 noted that these compliance demonstrations generally require the testing of both gas and liquid streams on multiple operating systems. According to commenter 0162, this testing requires significant time and resources that are not easily coordinated. Commenter 0162 noted that, during the IPT for each facility using CCA, the facility has to demonstrate that the CCA approach would result in lower emissions than the traditional compliance approach for HVLC systems, and the facility also has to conduct monitoring to ensure continuing compliance. Commenter 0162 concluded that, while CCA is an alternative compliance approach, it is a conservative option and actually results in a higher treatment standard and thus lower emissions.

Commenter 0163 noted that CCA approaches are site-specific, and often complex. The commenter's facility using a CCA has established a monitoring system adequate to assure compliance, based on the measured baseline and the initial performance demonstration. Absent a change in process configuration affecting condensate management, additional emissions testing would not provide any further assurance of compliance.

Commenter 0172 pointed out that it would also be inappropriate to require retesting of exempted systems (such as the knotting and screening 0.1/0.2 lb/ton exemption limit and decker water 400 ppm concentration limit) because these are not controlled systems and it would be very difficult to perform such retesting.

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[171] See memorandum from L. Lund, EPA Office of Compliance, to Regional Compliance/Enforcement Division Directors, *Issuance of the Clean Air Act National Stack Testing Guidance*, April 27, 2009, available online at: *http://www.epa.gov/compliance/resources/policies/monitoring/caa/stacktesting.pdf*.

Response: We acknowledge the commenters' support for our proposal not to require repeat testing for CCA compliance. We considered the complexity of the CCA approach (*e.g.*, comparison to baseline emissions calculations and the fact that it often involves both air and/or liquid sampling) in arriving at this decision. We estimated that repeating the CCA compliance demonstration would cost $130,000 per facility.[172]

The repeat testing requirements in the final rule remain as proposed, with the exception of some clarifying language regarding test dates and equipment exempt from repeat testing. The final rule clarifies that the first of the 5-year repeat tests must be conducted within 36 months (3 years) of the effective date of the standards, and thereafter within 60 months (5 years) from the date of the previous performance test for facilities complying with the standards for kraft, soda and semi-chemical pulping vent gases (§63.443(a)); sulfite processes (§63.444); and bleaching systems (§63.445). Quarterly sampling for biological treatment systems to demonstrate compliance with the kraft condensates standards in §63.446(e)(2) is already required under subpart S.

We have added clarifying language to the repeat testing requirement in §63.457(a)(2) in the final rule to address commenter 0172's statement about knotters, screens, and deckers exempted from the subpart S standards if they meet the HAP emissions criteria specified in §63.443(a)(1)(ii) or (iv). The clarifying language confirms that the 5-year repeat testing is not required for knotter or screen systems exempted from the standards based on the criteria specified in §63.443(a)(1)(ii)(A) through (C), or for decker systems exempted from the standards based on the criteria is §63.443(a)(1)(iv)(A) or (B).

120. Comment: Commenter 0218 stated that the EPA must implement strong enforcement provisions to prevent emission spikes, malfunctions and other violations in a way that will be enforceable by citizens in the title V permits for this source category. The commenter recommended that the EPA require periodic testing that will assure compliance and show EPA, states, and the public whether or not the facilities are in compliance. The commenter mentioned the need for strict monitoring and enforcement provisions to enforce the permit condition requirements of the Act, and monitoring requirements that are stringent enough so that EPA, states, and citizens can easily access information permitting them to assess whether a facility is in full compliance with the standards within a short period of time of any violation. The commenter suggested that the EPA require performance tests every year instead of every 5 years, to stay up-to-date on the industry's emissions and compliance status and allow states and citizens to gather data to assess and help assure compliance. The commenter also asked that the EPA require continuous monitoring of emissions from this source category to assure compliance.

Response: The EPA asserts that periodic testing every 5 years is sufficient and cost-effective for this source category. The EPA also asserts that the monitoring provisions are sufficient to ensure compliance between testing periods. Under the provisions of §63.15, the public can request access to reports submitted to the regulatory agency whenever they choose, with the exception of information protected through 40 CFR part 2 (*e.g.*, confidential business

[172] See memorandum from T. Holloway, K. Hanks, and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA, titled *Costs, Environmental, and Energy Impacts for the Promulgated Subpart S Risk and Technology Review*, May 15, 2012, in the docket for the subpart S rulemaking.

information). In addition, as discussed in section 7.3 below, EPA is promulgating requirements for electronic reporting of emissions test data that will improve public access to emissions information.

7.2 Emissions Test Methods

121. Comment: Commenter 0162 noted that EPA has requested comment on the appropriateness of rederiving the equation in subpart S to demonstrate compliance with the kraft condensate standards for biological treatment, specifically, whether the equation should be rederived without MEK, since the current equation requires the sampling and analysis of MEK and that pollutant was removed from the HAP list in 2005 (76 FR 81347-81348). According to the commenter, evaluating this equation will not affect the residual risk assessment and has nothing to do with whether the technology has changed. The commenter recommended that this equation not be rederived. Commenter 0162 stated that they, along with NCASI, spent a significant amount of time and effort during the original rule development to derive equations that would best demonstrate compliance with the standard based on conservative estimates. The commenter noted that the approach assumes that non-methanol HAPs are not biologically treated and, therefore, the facility must treat an additional quantity of methanol. According to the commenter, this is a conservative approach and actually requires additional treatment by each facility, so it results in lower emissions.

Conversely, commenter 0228 stated that the EPA removed MEK from the list of section 112 HAP in 2005, and it should not be included in subpart S calculations.

Response: As noted elsewhere by commenters, the value of the "r-factor" included in the biotrreatment system performance equation in §63.457(l) is typically around 0.02. The EPA reviewed the site-specific r-factor values reported in the ICR and agrees that this mass ratio of non-methanol HAPs to methanol HAPs is typically around 0.02, reflecting that approximately 2 percent of the measured HAP are non-methanol HAP.[173] MEK is a fraction of this 2 percent. We have decided not to discontinue inclusion of MEK in the §63.457(l) equation, given the small fraction of HAP that MEK comprises, the comment requesting that we retain the original equation, and the fact that retaining MEK does not reduce the stringency of the standard.

122. Comment: Commenter 0225 stated that much of Port Townsend Paper Corporation's reported emissions are simply drawn from industry tables rather than from direct measurement. Attempts to retrieve emissions reports were unsuccessful. There is no point source registry, and the commenter stated they are unable to locate the central repository for criteria pollutant reporting. According to the commenter, a memo between the regional air quality authority and Washington Department of Ecology attached to their comment indicates that PTPC is secure in refusing to provide certain emissions reports.

Response: A combination of emissions testing and emission factor calculations are commonly used to estimate emissions for purposes of mill emissions inventory development. This practice is not unique to PTPC. Specific emissions testing requirements are outlined in federal and state/local rules and permits. Due to the costs of air emissions testing, it is often not

[173] The average value of "r" reported in the ICR responses was 0.017, and the maximum was 0.06.

practical to require emissions testing for every single pollutant. Emission factors (typically from NCASI Technical Bulletins) are often used for emissions inventory development when a site-specific emissions test is not available for a particular process and pollutant. Otherwise, there would be gaps in the emissions inventory. However, mill-specific data in the form of operating factors (*e.g.*, pulp production rates, black liquor solids firing rates, annual operating hours) are used to calculate the emissions for each mill. While we did not find the referenced attachment in the docket, as stated in a previous response, under §63.15, the general public is able to request access to reports submitted to the regulatory agency whenever they choose, with the exception of information protected through 40 CFR part 2 (*e.g.*, confidential business information). In addition, as discussed in section 7.3 below, EPA is promulgating requirements for electronic reporting of emissions test data that will improve public access to emissions information.

123. Comment: Commenter 0225 noted that under §§63.7(e)(2)(ii) and (f) and 63.8(f) of the NESHAP GP, a source may apply to the EPA for permission to use alternative test methods or alternative monitoring requirements in place of any required testing methods, performance specifications, or procedures in the final rule and any amendments. The commenter stated that at PTPC, alternate test methods allow them to use industry tables to estimate emissions OR reduce their testing to once a year at a time of their own choosing OR submit one test instead of three. Given that there is a low level of oversight, the commenter is not confident of the results of such testing. The commenter asked that provisions be included to be sure that any alternate test methods are grounded in actual emissions in a meaningful way.

Response: In this action, EPA is documenting our findings regarding the residual risk and technology reviews for subpart S. While we are adding provisions for 5-year repeat testing (as noted in previous responses), we are not adding any changes to the alternative testing procedures in the NESHAP GP. The GP contain specific criteria that are to be used in evaluating requests for use of alternative test methods, changes to test methods, or a reduced frequency of testing. Regarding oversight, the EPA retains authority for approval of alternative standards, alternative test methods, alternative monitoring methods, and alternative reporting/recordkeeping under §63.458 of subpart S. Regarding PTPC using industry tables to estimate emissions, as noted in a previous response, emission factors (typically from NCASI Technical Bulletins) are often used for emissions inventory development when a site-specific emissions test is not available for a particular process and pollutant. It is often not practical to require emissions testing for every single pollutant due to the costs of air emissions testing.

7.3 Electronic Reporting

124. Comment: Commenter 0162 argued that the proposed electronic reporting requirement is not justified and would be excessively burdensome to industry. The commenter noted that the owner/operator is required to submit the test data to EPA's Central Data Exchange (CDX) by using the ERT when the data and methods are compatible with the ERT. According to the commenter, the performance tests conducted under subpart S are unique and unlike traditional stack tests, and the data collected and the standards that must be met are specific to the systems used to collect and treat condensates. The commenter also noted that there is no reason for EPA to require submittal of this test data because facilities are already required to submit performance test data to regulatory agencies and provide certifications on their semi-annual compliance reports that they have performed the required monitoring and will provide information on any

deviations from the testing requirements. According to the commenter, additional performance test reports provide no useful purpose, environmental or otherwise, to anyone and are an additional administrative burden on operating facilities. The commenter noted that ERT continues to be revised and updated due to various flaws, and that it would be unreasonable to put sources at risk of violations (late reporting) because of EPA reporting tool issues or availability.

Commenter 0207 stated that the proposed §63.455(h) requires performance test reports and continuous emissions monitoring system relative accuracy test audits (CEMS RATA) to be submitted electronically to EPA's WebFIRE database. The commenter noted that since it is likely that many states eventually will be delegated authority, this requirement is overly burdensome and costly for facilities with limited resources.

Both commenters (0162 and 0207) noted that a number of states already specify that performance test results be submitted in an electronic format and argued that EPA should remove its reporting format requirement from the rule and work more closely with states to develop a universal reporting system that is not costly or redundant, does not require different electronic reporting formats, and is not problematic and labor-intensive for data entry. According to the commenters, the rule's requirement, as proposed, is an extra, excessive burden for mills and stack testing vendors. The commenters stated that EPA needs to defer any electronic collection of data until the CDX and WebFIRE systems are fully functional, user-friendly, and streamlined with states.

Response: The EPA agrees that there are some test methods used in this rule that currently cannot be documented using the ERT. The rule only requires the use of the ERT when the test methods are supported by the ERT. The EPA disagrees that test methods used to comply with this rule should not be documented. The EPA acknowledges that there may be existing reporting programs in place. However, the compliance test reporting requirement in this rule does allow for quick and easy access of the data by state, local, and tribal entities, as well as the public. As of January 1, 2012, the CEDRI has been fully functional. Since that time, ERT submittals via CEDRI and the CDX were transferred into EPA's Webfire database, which is publicly accessible. WebFIRE provides a convenient location, which is already used to store source test data allowing regulatory authorities access to Cross Media Electronic Reporting Rule (CROMERR) compliant test reports. As EPA and state/local agency data systems mature, information provided through the ERT will be used to populate these data systems. We are currently upgrading the Aerometric Information Retrieval System (AIRS)/Air Facility System (AFS) and expect to replace manually entered information with electronic population from the ERT. We are also working with several state and local agencies to adopt the use of the ERT for delivery of compliance test reports. We disagree that all systems to receive and process the compliance data must be operational prior to establishing the requirement for regulated sources to submit compliance data electronically.

125. Comment: Commenter 0163 was concerned with EPA's proposal to require use of the ERT for electronic reporting. The commenter's experience with this system during the Boiler MACT ICR surveys was poor. The commenter noted EPA is requesting information to be routinely reported for matters of convenience to Agency information gathering, which adds large burden to the permittees individually and as a whole. Regarding the effective date, the

commenter's facilities would need time to adapt reports to fit the format, and EPA needs to consider the time needed to avoid duplication of work for reporting to permitting agencies using different formats. The EPA, the states, and permittees will need time to work out compatible formats for such reporting.

Response: The EPA disagrees that the ERT is excessively burdensome. The commenter's experience with the ERT used during the Boiler MACT ICR is not indicative of the current performance. The EPA has implemented many programming changes that address most of the issues users had with the version of the ERT that was available in 2009. Since the Boiler MACT ICR, there have been 27 revisions to either correct issues which users have encountered or to add test methods.

The EPA disagrees that the ERT requires the reporting of vast amounts of data that are not currently required for convenience to the Agency's information gathering. The commenter may be confusing the presence of a data field as one that requires entry of data. Also, the commenter may be confusing the level of information the EPA required in the Boiler MACT ICR with what would be required for a compliance test report. The EPA made the ERT flexible to accommodate a wide variety of existing data requirements specified by various state and local agencies and specified in various published EPA test methods and published state and local agency test methods. The EPA does not expect sources to enter data into every available field of the ERT for every source test. The subpart S rule specifies the specific data which are required to be reported in the ERT. In addition, each state or local agency which has delegated authority has provided guidance on those data elements which they expect in compliance source tests. The commenter's question about the effective date is addressed below in section 8 of this document.

126. Comment: Commenter 0218 supported the EPA's proposal for electronic reporting, and asked that this apply to all emission and performance test data and other parameters that the standards use to gauge compliance. The commenter suggested that the required compliance records be reported at least annually to the EPA and the states, and ensure that these are made publicly available promptly. The commenter observed that, as the public has a right to all collected reports under the CAA, it is important that the EPA ensure immediate disclosure of these reports to the public on the Internet within 7 days of receipt of a report, without the need for any person to submit a request under the Freedom of Information Act. The commenter also asked that the EPA require continuous monitoring of emissions for compliance, and immediate reporting on the Internet of all monitoring reports.

Commenter 0218 also asked that the EPA promulgate specific public reporting and notification requirements for malfunctions or any emission exceedances. The commenter noted that the EPA proposes to require malfunction reporting by telephone no later than 2 business days after the malfunction or exceedance, and to require a written report to EPA within 45 days. The commenter suggested that the EPA require this reporting regardless whether a facility intends to try to take advantage of an affirmative defense (which EPA should not authorize).

The commenter asserted that these reporting time periods are too long for people that are near the facility and asked that the EPA require telephone reporting by the facility no later than 24 hours after the malfunction or exceedance, made publicly available on EPA's website and through EPA's Enforcement and Compliance History Online (ECHO) system within 24 hours.

The commenter recommended that the EPA Administrator provide this information to its Regional office within 24 hours of receiving notification, and direct the Regional office to notify the local community on the Internet, by direct communication, and through all available means. Further, the commenter asserted that the facility must provide community notification of the malfunction or emission standard exceedance within 24 hours, through an appropriate public forum (*i.e.*, facility's website, municipalities, schools, and local media) that contains any information community members may need to try to protect themselves and their families from the additional air pollution.

The commenter recommended that the EPA require a written report to be submitted within 7 days to be distributed to the community, including publication on ECHO, and sending this to active local community members through electronic and other media. The commenter asked that the report include: (1) the nature of the event; (2) the duration of the event; (3) estimate of emissions released during the event; and (4) a description and timing of corrective actions that were taken and any planned to be taken.

Commenter 0218 also asked that the EPA promulgate additional requirements that apply in the event of a malfunction or violation of the numerical emission standards so that facilities are not allowed to emit in an unlimited manner for an unlimited period of time. The commenter recommended further actions in the case of an exceedance or malfunction:

1. The EPA must require automatic shut-off of the malfunctioning equipment or process for the time needed to take corrective action, whenever an exceedance or malfunction occurs.

2. The EPA must assign responsibility and liability to the plant manager or a high-up staff member to allow only that person to restart the equipment or process.

3. The EPA must require specific corrective measures to be taken immediately, to remedy and prevent recurrence of the malfunction or violation.

4. For a facility that has had one or more malfunction, exceedance, or other violation incident in the prior month, written authorization by EPA must be required to restart equipment or processes. The EPA should only authorize restart after making a public determination that provides information on the corrective measures that EPA is requiring. The EPA should release this public determination on the Internet and require its Regional office to communicate this determination to all interested members of the public, including local community representatives.

5. If a facility has more than 4 exceedances or malfunctions during the same quarter, then EPA must require automatic shut down of the operation for a period of time needed to conduct and publish a full investigation and ensure systematic correction of the problems.

6. The EPA should create a community complaint mechanism in the standards that ensure that a citizen complaint of clouds, plumes, exceedances, odors, other air pollution incidents or health concerns receive an immediate response from EPA's enforcement division within 7 days, in which EPA commits to initiate an investigation and provide a publicly available report of the result of the investigation, including whether it leads to an enforcement outcome.

Response: As of January 1, 2012, the EPA has provided almost immediate access to ERT submittals through WebFIRE. The compliance test reporting requirement in this rule allows for quick and easy access of the data by state, local, and tribal entities, as well as the public. As of January 1, 2012, the CEDRI has been fully functional. Since that time, ERT submittals via CEDRI were transferred into EPA's Webfire database. While this information does not cover all the information the commenter has identified, EPA's intentions are to expand the types of performance test data the ERT is capable of documenting and to develop an electronic submission method for other types of compliance data. In addition, EPA is modernizing the AIRS/AFS data system, which is EPA's primary air compliance reporting data system (which may include publication on ECHO), with plans to integrate the data between WebFIRE and AIRS/AFS. Since the development of the compliance reporting methods and the AIRS/AFS modernization are early in their development, the timelines that will be adopted are unclear. It is likely that the timelines for availability of information will be shorter than the existing timelines.

While we are improving access to emissions data with this final rule, we are not including the requirements listed by the commenter in the final rule. The requirements suggested by the commenter were not proposed for public comment, and we have no information to estimate the costs or burden under the PRA for these requirements. The EPA would be interested in more information from the commenter regarding any specific circumstances or events that demonstrate why requirements such as these are appropriate.

8. Compliance Dates

127. Comment: Three commenters (0162, 0163, and 0207) objected to the different compliance dates included in the proposed rule. The commenters noted that the proposal (at 76 FR 81349) requires existing sources comply with proposed affirmative defense and electronic reporting provisions upon promulgation and comply with all other proposed requirements within 3 years after the effective date. The commenters supported setting the compliance date at 3 years after the effective date for all new requirements.

To the contrary, commenter 0218 stated that delay of compliance for the new standard for 3 years is unlawful and arbitrary. The commenter argued that in enacting the provision governing the compliance schedule for section 112(d), Congress stated that it wanted expeditious compliance. The commenter asserted that the EPA has failed to demonstrate that this 3-year MACT compliance date for existing sources would provide for compliance as expeditiously as practicable, and, by failing to begin this rulemaking earlier, the EPA has already delayed satisfying its legal duties under sections 112(f)(2) and 112(d)(6) to provide protection for affected local communities. The commenter stated that, in light of the statutory context and circumstances mandating promulgation of a rule in 2006, EPA has no lawful justification for delaying the compliance date any longer.

Response: We have reviewed the comments and clarified the compliance dates in the final rule as follows:

1. The date 36 months (3 years) after the effective date of the final rule for conducting the first 5-year repeat test;
2. The date 60 months (5 years) from the date of the previous performance test is the date for conducting the next 5-year repeat test;
3. The date 60 days following the completion of the performance test is the date for submitting the performance test results to the ERT; and
4. The effective date of the final rule (*i.e.*, date of publication in the *Federal Register*) is the compliance date for the SSM changes (including the affirmative defense provisions).

Comments relating to the SSM provisions and electronic reporting are addressed in more detail in the next response. With respect to the additional time provided beyond the final rule effective date to comply with the repeat testing requirements and electronic reporting requirements, we have elected to set a compliance date for those requirements consistent with CAA section 112(i)(3) for the following reasons.

The repeat testing requirements we proposed apply for the kraft, soda, and semichemical pulping vent gases (§63.443), sulfite pulping vent gases (§63.444), and bleaching systems (§63.445). Facilities will need time to prepare and submit for approval their test plans for the 5-year repeat emissions testing. Facilities and permitting authorities will likely need time to synchronize the new subpart S repeat testing requirements with the repeat testing schedule specified in permits (where applicable). Therefore, we conclude that 36 months (3 years) is as "expeditiously as practicable" to implement the repeat emissions testing requirements, and the results would be reported to the ERT 60 days later.

128. Comment: Compliance date for SSM changes. Commenter 0162 noted that the elimination of the SSM provisions would apparently be effective immediately upon promulgation. The commenter stated that EPA has not really assessed the effect of eliminating that provision, because it could require mills to make significant changes to their HAP collection and treatment systems, such as installing redundant equipment not currently required, which would take significant time for design, engineering, acquisition, and installation. The commenter argued that there was no justification for making such a change in the existing regulations effective immediately, as EPA has proposed.

Commenter 0163 stated that the proposed affirmative defense provisions for malfunctions, assuming EPA finalizes them, will require substantial time after the final rule is issued to evaluate and understand the final rule provisions, review and understand what changes are needed to their existing procedures to implement those provisions, prepare and/or revise existing procedures and other documents as necessary, provide operator training, and then implement the changes. These are not insignificant process management and training changes, and the commenter believes that EPA has underestimated needed transition time to implement them. The commenter noted the likelihood that judicial challenges of the affirmative defense provision may be filed as under other MACT rules where EPA is inserting the approach. Given the significant process management changes required, EPA should consider delaying compliance until the judicial outcomes are settled, in order to minimize confusion and disruption.

Commenter 0207 stated that, unless EPA leaves the rule as is, many mills will have to physically modify their operations to comply with additional performance requirements. Simultaneously, companies will have to re-visit process control parameters (*e.g.*, burn permissives) and install additional hardware and software to monitor processes, collect data, classify events, and generate internal and externally-mandated reports. This would come at significant cost that was not included or evident in EPA's cost estimates. The commenter stated that at least 3 years are needed to fund, engineer and complete these interrelated efforts.

Response: We disagree that there is no justification for making rule changes that eliminate the SSM provisions effective upon promulgation. The D.C. Circuit Court vacated the SSM provisions in December 19, 2008. In the interim, prior to the Court's mandate of the SSM vacatur, EPA issued a letter dated July 22, 2009 from Adam Kushner, Director, Office of Civil Enforcement, to various parties that addressed concerns that had been raised regarding the impact of the decision in *Sierra Club v. EPA*, 551 F.3d 1019 (DC Cir. 2008). The mandate implementing the Court's decision was issued on October 16, 2009, at which time the SSM provisions were clearly no longer in effect. In addition, amendments to subpart S were proposed on December 27, 2011, at which time mills were put on notice of the specific wording changes to subpart S. Thus, facilities have had ample notice that EPA would remove the SSM exemption.

Regarding the time needed to implement the affirmative defense provisions for malfunctions, facilities have had practices in place to minimize emissions during malfunctions at least since the compliance date of the original MACT standards. Since the affirmative defense against civil penalties for violations of emission limits that are caused by malfunctions is available immediately, we expect facilities will either be able to meet the emission standards during malfunctions or will be able to use the affirmative defense upon the effective date of this rule.

Regarding the "likelihood that judicial challenges of the affirmative defense provision may be filed," we note that EPA cannot predict judicial filings and the CAA does not explicitly allow time for judicial proceedings to complete before a rule becomes effective.

Contrary to commenter's assertion that EPA ignored costs of the SSM revisions, EPA's proposal cost analysis included a one-time cost to revamp existing recordkeeping systems to be consistent with the proposed revisions to the startup and shutdown provisions, and included costs for affirmative defense. These costs were derived from the PRA supporting statement developed for proposal.[174,175] These costs have also been included in the final cost analysis and supporting statement.

129. Comment: Commenter 0162 was confused by the ERT submittal dates in the proposed rule. According to the commenter, section IV.E of the proposal preamble ("Compliance Dates," at 76 FR 81349) states that electronic reporting is "effective upon promulgation of the final rule," but the revised §63.335(h)(2) states that "As of January 1, 2012 and within 60 days after the date of completing each performance test, you must submit performance test data, except opacity data, electronically to EPA's Central Data Exchange (CDX) by using the Electronic Reporting Tool (ERT)…" The commenter stated that this language was confusing because it could be concluded that, once the rule is effective, all test reports since January 1, 2012 should have been submitted within 60 days of testing prior to the rule being effective.

Commenter 0163 stated that the performance tests and CEMS quality assurance tests would be required to be submitted before the close of business on the 60th day following the completion of the performance test and, except for opacity data, the data must be submitted electronically to EPA's CDX by using the EPA's ERT. The commenter believes neither the proposed electronic reporting nor manual reporting of performance tests should be retro-effective back to January 2012, nor should the reporting requirement become effective on the final rule effective date.

Response: The EPA agrees that there should not be a retro-effective test reporting requirement, as the commenter believes was required in the proposed rule. The date of January 1, 2012 was included because of the expected date that EPA's CDX could accept ERT submissions. We have revised the electronic reporting requirement dates to agree with the testing requirements established in the rule. The compliance date for the repeat testing requirement is 36 months (3 years) after the effective date of the final rule. The results of repeat tests (or other performance tests used to show compliance with subpart S) performed using methods supported in the ERT are required to be submitted to the ERT before the close of business on the 60th day following the completion of the performance test.

[174] See memorandum from T. Holloway, K. Hanks, and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA, titled *Costs and Environmental and Energy Impacts for Subpart S Risk and Technology Review*, November 17, 2011, in the docket for the subpart S rulemaking.
[175] See U.S. EPA, *Supporting Statement: NESHAP for Pulp and Paper Production (40 CFR Part 63, Subpart S) (Proposed Amendments,* November 2011.

9. Regulatory Impacts

130. Comment: Cost Impact to Comply with 94 Percent Treatment Efficiency. Commenter 0162 argued that EPA underestimated the cost impact to comply with the 94 percent kraft condensate treatment efficiency provision in the proposed rule. The commenter noted that EPA estimated the capital cost of the proposed modifications to the condensate standards at $36 million and projected annual cost at $4.1 million ($1,000/ton HAP), based on 7 mills needing to upgrade their biological treatment systems and 8 mills needing to upgrade their steam strippers.[176] The commenter believed the capital cost to meet an increase in required treatment efficiency from 92 to 94 percent would be closer to approximately $300 million (approximately $150 million annually, or $38,000/ton HAP). The commenter noted that their cost estimates are based an increase in condensate treatment only, using their methodology for the equivalent lb/ODTP treatment (10.4/6.8 lb/ODTP), and not the lb/ODTP limits (12.8/8.3 lb/ODTP) proposed by EPA that are not achievable without additional collection. The commenter pointed out that most of the emission reductions would be methanol, which the commenter said does not present a risk, according to EPA's own risk analysis, and is of relatively low toxicity.

According to commenter 0162, EPA did not include any information in the preamble to the December 27, 2011 proposed rule or in the docket describing how EPA expected mills to comply with the new standards, so the commenter carefully examined what would be necessary to comply with the proposal. The commenter noted that all cost estimates in their comment are based on the best information available, given the limited time to gather data during the 60-day comment period, and were developed using conservative estimates of upgrades and number of units affected and not detailed mill-by-mill engineering estimates. The commenter pointed out that, even with these caveats, their cost estimates are an order of magnitude higher than EPA's. The commenter acknowledged that these estimates are somewhat different from those presented to EPA on January 12, 2012 because they made further refinements and gained more information from member companies since that time.

Commenter 0162 noted that EPA estimated that a change in treatment efficiency from 92 to 94 percent would result in the reduction of 4,000 tons of HAP from the industry per year (76 FR 81345, 81349). The commenter stated that this estimate assumes that all 97 mills achieve a 0.2 lb/ODTP HAP reduction, at a production rate of 1,000 ODTP per mill per day, but the commenter noted that EPA estimated only 15 mills would be required to spend capital to comply with the proposed standard.[177] According to commenter 0162, the 15 mills for which EPA generated an estimated compliance cost would only achieve a total estimated annual HAP reduction of 547 tons (0.2 lb/ton x 1000 tons per day (tpd) x 365 days per year (d/yr) x 15 mills / 2000 lb/ton). According to the commenter, if EPA was inaccurate in its assessment of the number of mills that would need to make upgrades to meet the proposed 94 percent reduction requirement and the cost for them to do so, then the correct estimated cost/ton would be $7490/ton, rather than the $1000/ton stated by EPA. Commenter 0162 noted that even that cost per ton (to control mostly methanol) is much lower than what they believe would be the true cost

[176] See memorandum from T. Holloway, K. Hanks, and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA, titled,*Costs and Environmental and Energy Impacts for Subpart S Risk and Technology Review*, November 17, 2011, in the docket for the subpart S rulemaking. ("EPA 11/17/2011 Cost Document").
[177] *Id*.

per ton of increasing required condensate treatment from 92 to 94 percent efficiency, as shown below.

As noted elsewhere, the commenter believes that EPA incorrectly calculated the proposed lb/ODTP treatment standards that are equivalent to 94 percent. For the purposes of this estimate, the commenter assumed that the treatment standards equivalent to 94 percent are 10.4/6.8 lb/ODTP (bleached/unbleached). As shown in Table 11 below, the commenter estimated that total capital costs would be approximately $320 million, with annual costs of approximately $150 million, or $38,000/ton (using the same 4,000 tons of reductions identified by EPA).

Table 11. Costs of Proposed Condensate Treatment Standards (Assuming Nominal 2 Percent Change in Treatment Efficiency) (Submitted by Commenter 0162)

	Capital Cost	Annualized Capital[178]	Annual Energy Cost	Annual Maintenance Cost	Total Annual Cost
Stripper Upgrade	$ 94 M	$ 8.8 M	$ 8 M	$ 3 M	$ 20 M
Current Strippers (Energy Only)			$ 8 M	$ 3 M	$ 11 M
Aeration	$ 230 M	$ 21.6 M	$ 90 M	$ 9 M	$ 121 M
Nutrient Addition				$ 2 M	$ 2 M
Total Cost	**$ 324 M**	**$ 30.4 M**	**$ 106 M**	**$ 17 M**	**$ 154 M**

According to commenter 0162, the costs were based on the following (and further detailed in an attachment to their comment):

- The commenter projected that upgrades to both steam strippers and wastewater treatment systems will result in control systems that can achieve the required treatment efficiencies.
  - According to the commenter, achieving higher treatment efficiency in steam strippers will require more energy, trays, and steam contact area per incremental percent reduction.
  - The commenter noted that their estimates assume the 10 percent downtime provision for steam strippers remains in place; otherwise, the commenter indicated a backup control device (at a minimum) would be needed, which the commenter said would significantly raise costs.
  - For wastewater treatment systems, the commenter assumed that an increase in aeration and nutrient addition would be sufficient to achieve the requirements. For reasons described above, the commenter noted that wastewater treatment systems are currently required to target treatment levels close to 99 percent to comply with the current standard of 92 percent. According to the commenter, as required efficiency increases, upgrading the wastewater treatment systems will become technically infeasible and cost prohibitive. The commenter argued that, in many if not most

[178] Capital costs annualized using the same 0.094 capital recovery factor EPA used, see EPA 11/17/2011 Cost Document, p. 4.

cases, it will not be feasible to respond to increased required treatment efficiency through upgrading the condensate collection and wastewater treatment system, and said that the mill would most likely decide to install a new stand-alone steam stripper, at much higher cost than estimated. However, to be conservative, the commenter assumed that all 39 mills that use only the WWTS as a condensate control device will only need increased aeration and nutrient addition to achieve a 94 percent control efficiency.

- The commenter used a cost of $2.9 M each for steam stripper upgrades, based on information from member companies, rather than EPA's assumed cost of $2.7 M.

- The commenter noted that strippers can either be stand-alone units or integrated and indicated that, based on initial input from their members, they identified 10 integrated units. Because the total number of strippers being used for subpart S compliance is 52, the commenter assumed that 20 percent of strippers that required upgrades were integrated and the remaining 80 percent were stand-alone units. The commenter indicated it is unlikely that integrated units can be upgraded in the same way as stand-alone units, and used estimated unit costs for integrated units that are twice the cost for a stand-alone unit.

- Commenter 0162 believes that 27 mills would actually require upgrades to meet the 94 percent treatment efficiency requirement, based on the need for a margin of safety for compliance at 96 percent removal, instead of the 8 strippers assumed by EPA. Therefore, the commenter assumed that mills that only have a stream stripper for condensate control and reported a treatment efficiency at or below 96 percent (23 mills) would need upgrades. The commenter also assumed that 50 percent of the mills that have dual treatment systems (6 mills that use both steam stripping and biological treatment and the 2 mills that use steam stripping and recycling) that reported treatment efficiencies at or below 96 percent would need steam stripper upgrades, for a total of 27 mills that would require steam stripper upgrades.

- According to commenter 0162, capital costs for increased aeration were based on the average cost for four different mills. In addition to the capital costs outlined above, the commenter indicated that each mill would have the following increase in operating costs:
  - Additional energy to operate steam strippers at a higher efficiency
  - Additional energy to operate more aerators in the wastewater treatment system.
  - Additional maintenance for steam strippers to maintain higher treatment efficiencies
  - Additional maintenance for aeration and nutrient addition equipment

Commenter 0162 argued that these daily activities would not only add more cost to implement the proposed changes, but would also increase emissions from combustion units required to generate additional energy in the form of steam and/or electricity. The commenter stated that EPA had not accounted for these additional costs or energy impacts in its evaluation.

Commenter 0162 noted that, in considering whether to make the existing MACT standards more stringent pursuant to CAA section 112(d)(6), EPA must take into consideration the cost of achieving additional emission reductions and non-air-quality health and

environmental impacts and energy requirements. See *NRDC v. EPA*, 529 F.3d at 1084. According to the commenter, EPA had not done so, even with respect to EPA's greatly understated estimate of the expenditures required. The commenter further noted that EO 13563 directs EPA to assure, to the extent allowed by law, that the benefits of any new rule justify its costs and that EPA chose regulatory approaches that minimized the net burden imposed. The commenter stated that EPA can and should consider such factors in a technology review under CAA section 112(d)(6). According to the commenter, requiring an expenditure of approximately $38,000 per ton of methanol removed is not at all cost-effective. The commenter also argued that requiring a diversion of $300 million of capital from other productive investments to address an insignificant risk, and also increasing mills' energy needs for the higher steam stripper performance, was not a reasonable action under CAA section 112(d)(6).

In addition to commenter 0162, commenter 0163 also found issue with EPA's reported costs for the 94 percent condensate control option. *i.e.*, $36 million capital cost, an annualized investment of $4 million per year for the industry, and a cost effectiveness of $1000 per ton of HAP. [76 FR 813452] The commenter believed that the EPA's proposed standard was inaccurately determined and subject to being changed substantially. Therefore, the commenter did not develop a cost estimate for their facilities that may be impacted by a more stringent condensate HAP standard. The commenter believed EPA may have understated the potential costs because the loss of compliance margin at many mills does not seem to be accounted for in the small number of projected facilities (15) that would be affected.

Commenter 0170 believed the proposed lb/ton of methanol destruction requirement for process condensates was determined based on an errant methodology, resulting in a limit that would necessitate substantial modification or replacement of over 20 of their control systems that employ the lb/ton compliance option. The commenter stated that the proposed increase in methanol destruction efficiency for condensates (from 92 to 94 percent) would require substantial modification or replacement of up to 8 of their control systems in order to maintain an adequate margin of compliance. The commenter noted that EPA had estimated fewer system changes would be necessary.

Commenter 0167 stated that it was important for the EPA to recognize that additional collection would be required and an increase in steam demand would be required for condensate strippers when considering the proposed kraft pulping condensate standards. The commenter stated that it was not apparent that the EPA had appropriately factored these costs or associated environmental impact to produce the necessary steam. The commenter stated that the EPA should more fully evaluate these impacts in its cost/benefit analysis.

Response: We disagree with commenter 0162's claim that EPA did not include any information in the preamble to the December 27, 2011 proposed rule or in the docket describing how EPA expected mills to comply with the new standards. The preamble indicated that, "The three control strategies expected to be used by most mills are recycling the condensates, biological treatment and steam stripping," (76 FR 81345) and noted that biotreatment system and stripper upgrades were considered in EPA's cost analysis (76 FR 81349). In addition, two separate memoranda were included in the docket (and referenced in the proposal preamble) to address our conclusions at proposal regarding the performance of condensate treatment systems

and cost and environmental impacts of the proposed changes to the condensate standards.[179,180] Following proposal, EPA met with this commenter on multiple occasions to discuss the kraft condensate standards and the basis for the commenter's cost estimates.[181] The commenter supplied additional information based on actual mill experiences and refined their cost estimate (that was developed quickly during the 60-day comment period) in response to EPA questions. The commenter's refined estimate was $222 million capital cost and $68 million annualized cost.[182]

Elements of the commenter's cost and energy impact calculation were included in EPA's cost assessment for the final rule. The EPA considered two regulatory options for the final rule, 93 and 94 percent HAP removal from condensates. Treatment system performance levels were completely reanalyzed on a mill-by-mill basis, using data from both the pulp and paper Part I ICR *Kraft Condensates* and *Wastewater* tables. Mills using the lb/ODTP (or ppmw) compliance option were evaluated based on those options instead of using the equivalent percent reduction derived for the proposal analysis (also used as the basis for portions of the commenter's cost calculation). We also updated the predominant treatment method for a few mills after a closer review of their ICR data and identified mills operating strippers integrated with multiple effect evaporators. Our revised analysis took operational and treatment system performance variability into account and assigned costs to mills where their reported performance level plus a variability cushion did not meet the 93 or 94 percent treatment (or equivalent lb/ODTP or ppmw) regulatory option.

Our analysis revealed that, of the 40 mills using biotreatment as their predominant condensate treatment method, 20 mills would be affected under the 93 percent option and 23 mills would be affected under the 94 percent regulatory option. Either biotreatment system upgrade (aeration and nutrient addition) costs or new steam stripper costs were assigned for these facilities. A total of 13 and 15 mills were predicted to install a new steam stripper under the 93 and 94 percent options, respectively. Of 49 mills using strippers, a combination of stripping and recycling, or stripping and biotreatment as the predominant form of condensate control, 24 were determined to have integrated stripper systems (though not all of these integrated strippers were determined to be affected). Stripper upgrade costs were assigned for 28 and 31 stripper systems under the 93 and 94 percent regulatory options, respectively. Thus, the overall number of mills affected by the 94 percent kraft condensate option increased from 15 mills (at proposal) to 54 mills in the revised analysis prepared for the final rule.

At proposal, the estimated HAP emission reduction from condensates was attributed to all 97 kraft mills because the proposed revisions would reduce the permissible HAP emissions even at mills that would not realize any actual emissions reduction because they are already

[179] See memorandum from J. Bradfield and K. Spence, EPA, to Docket EPA-HQ-OAR-2007-0544, titled *Summary of Kraft Condensate Control Technology Review*, October 23, 2011, in the docket for the subpart S rulemaking.
[180] See memorandum from T. Holloway, K. Hanks, and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA, titled *Costs and Environmental and Energy Impacts for Subpart S Risk and Technology Review*, November 17, 2011, in the docket for the subpart S rulemaking.
[181] See U.S. EPA documents, titled *Meeting notes for the January 12, 2012 meeting with AF&PA*; *Meeting notes for the March 16, 2012 meeting with AF&PA*; *Meeting notes for the March 28, 2012 meeting with AF&PA*; and *Meeting notes for the May 2, 2012 meeting with AF&PA*, in the docket for the subpart S rulemaking.
[182] See U.S. EPA document, titled *Meeting notes for the May 2, 2012 meeting with AF&PA*.

performing better than the proposed 94 percent removal. In the revised analysis prepared for the final rule, the HAP, VOC, and TRS emissions reduction calculations were revised to apply only for the mills anticipated to need upgrades, rather than to reflect the potential emissions reduction for all 97 kraft mills. This approach more accurately estimates the emission reduction that would actually occur as a result of revising the kraft condensate standards.

The revised analysis prepared for the final rule considered the cost impact of revisions to the condensate standards on CCA mills. Of the 38 CCA mills, we estimated that the CCA compliance approach could potentially be negated by the condensate standard revisions at 11 mills, and that these mills would switch from the CCA to use HVLC controls. Switching from CCA to HVLC control was estimated to cost $15 million in capital costs and $1.89 million/year in annual costs per mill. We also estimated that 34 of the 38 CCA mills would be required to repeat their CCA compliance demonstration, at a cost of $130,000 per mill.[183]

Table 12 summarizes the nationwide cost impacts and emissions reductions estimated for the kraft condensate regulatory options considered for the final rule. The estimated nationwide HAP emissions reductions range from 989 to 2,300 tpy for the 93 and 94 percent removal options. When the costs associated with the repeat CCA demonstration and switching from CCA to HVLC are added, the cost effectiveness of the kraft condensates regulatory options becomes $75,000/ton and $37,000/ton for the 93 and 94 percent removal options, respectively. The costs estimates prepared for the final rule are significantly higher than the proposal estimates because a greater number of mills were determined to be affected, considering variability in performance and because we have accounted for potential effects on CCA mills. Three small businesses were determined to be affected by the kraft condensates regulatory options, one with a cost-to-sales ratio of 15 percent (well above the criteria for further consideration of small business impacts under the Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA)).

Energy impacts of the regulatory options include electricity use by upgraded aerators in biotreatment systems or for new stripper systems, and increased steam use by upgraded or new steam strippers. Energy impacts (and associated secondary air emissions) for stripper steam generation were not estimated prior to proposal, based on an assumption that upgraded steam strippers would likely be more efficient. Energy and secondary air emission impacts for new and upgraded steam strippers were included in the revised analysis prepared for the final rule, and were found to be significantly higher than the secondary air emissions estimates for electricity usage. Secondary impacts from additional steam requirements are the consequence of the additional boiler loads necessary to generate the steam. These impacts are summarized in Table 13 below and include the criteria pollutants PM, CO, NO_X, and SO_2 and the greenhouse gases (GHGs) carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). When converted to CO_2 equivalents (CO_2eq), the GHG emissions associated with the 93 and 94 percent removal options would be 1,018,048 and 1,402,084 tpy CO_2eq, respectively.

[183] See memorandum from T. Holloway, K. Hanks, and C. Gooden, RTI, to J. Bradfield and B. Schrock, EPA, titled *Costs, Environmental, and Energy Impacts for the Promulgated Subpart S Risk and Technology Review*, May 15, 2012, in the docket for the subpart S rulemaking.

Table 12. Summary of Nationwide Costs and Cost Effectiveness for the Kraft Condensate Regulatory Options

Subpart S regulatory option	Costs		Emissions reductions, tpy		Cost effectiveness, $/ton HAP	No. of mills affected
	Capital, $million	Annualized, $million/yr	HAP/ VOC[a]	TRS		
92% → 93%	$227	$52.6	989	336	$53,175	48
92% → 94%	$254	$63.3	2,300	702	$27,508	54
Repeat CCA Demonstration	$4.42	$0.996	--	--	--	34
Switching from CCA to HVLC	$165	$20.8	Not estimated[b]	Not estimated[b]	--	11
Total costs for condensate options:						
93%	**$396**	**$74.4**	**989**	**336**	**$75,000**	
94%	**$423**	**$85.1**	**2,300**	**702**	**$37,000**	

a. HAP emissions are approximately 99% methanol and 1% acetaldehyde. VOC emissions reductions would be essentially equivalent to HAP emissions reductions.

b. Because the CCA compliance approach, by design, must achieve greater HAP emission reduction than the HVLC compliance approach would have achieved, it can be expected that HAP emissions may increase as a result of switching to HVLC if the mill were to abandon the CCA technology generating emissions credits.

Table 13. Summary of Estimated Nationwide Environmental and Energy Impacts

Subpart S regulatory option	Energy impacts, MMBtu/yr		Secondary emissions, tpy							No. of mills affected
	Electricity	Steam	PM[a]	CO	NO_X	SO_2	CO_2	CH_4	N_2O	
92% → 93%	99,419	660	430	2,082	1,443	659	1,004,258	65	40	48
92% → 94%	113,685	910	593	2,870	1,986	901	1,383,081	89	55	54

a. Filterable (front-half) PM.

The EPA must take into consideration the cost of achieving additional emission reductions and non-air-quality health and environmental impacts and energy requirements when setting standards pursuant to CAA section 112(d)(6). The EPA no longer considers the proposed 94 percent revision to the kraft condensate standards to be cost-effective in terms of the amount of HAP reduced. Nor does EPA consider the 93 percent regulatory option considered for the final rule to be cost-effective. The nationwide energy impacts and secondary air emissions associated with regulatory options are substantial compared to the HAP emissions reduction, primarily due to the power boiler emissions associated with the increased steam demand needed for new and upgraded steam stripper systems. Additionally one affected small business was estimated to experience a cost-to-sales ratio of 15 percent. For all of these reasons, EPA decided not to finalize the proposed amendments to the kraft condensate standards (based on the 94 percent reduction option) or to promulgate a slightly less stringent standard than proposed (based on the 93 percent reduction option).

131. Comment: Cost Impact to Comply with Proposed Lb/Ton Removal Limits. Commenter 0162 argued that EPA underestimated the cost impact to comply with the lb/ton of pulp removal limits in the proposed rule. For the purposes of this estimate, the commenter assumed that the treatment standards were those published in the December 27, 2011 proposal, and that mills wishing to use the compliance option based on demonstrating the mass of HAP removed per ton of pulp produced would have to demonstrate the 12.8/8.3 lb/ODTP (bleached/unbleached) removal rates in the proposal, rather than the nominal increase in removal rates associated with increasing condensate treatment efficiency from 92 to 94 percent, described above. The commenter estimated that total capital costs would be approximately $834 million, and annualized capital costs plus operation and maintenance costs would be over $200 million, or 50 times greater than EPA estimated.

Commenter 0162 stated that the proposed lb/ODTP standard for condensate treatment would require additional collection of condensates from non-CCA mills, as explained above, based on the investments described above, plus additional collection of condensates from CCA mills. The commenter estimated that currently 38 mills use the CCA in §63.447 for MACT I Phase 2. Of those 38 mills, the commenter estimated that 34 demonstrated compliance through collection of additional condensates, which the commenter said would need to be increased. According to the commenter, if those mills were required to demonstrate an increased removal of HAPs in condensate of approximately 25 percent, as EPA has proposed, then, based on their current configurations, the mills using the CCA likely could not continue to rely on the CCA to comply with the new lb/ODTP removal requirements. Therefore, the commenter assumed that all mills currently using the CCA would need to collect HVLC gases and route them to a single control device. The commenter estimated this capital cost at $15 million per mill. The commenter noted that this cost assumed the 4 percent venting provision for HVLC systems remained in place; otherwise the commenter indicated a backup control device (at a minimum) would be needed, at substantial additional cost.

Commenter 0162 argued that imposing a cost of approximately $200 million per year to achieve only an incremental reduction in emissions of mostly methanol would not be cost-effective. The commenter also argued that requiring a diversion of $834 million in capital from other productive investments to address an insignificant risk, and also increasing mills' energy

needs for the higher steam stripper performance, was not a reasonable action under section 112(d)(6).

Response: As stated previously, EPA did not intend to propose an increase in the condensate collection requirements. Therefore, the commenter's cost estimates included here (and the revised costs discussed on May 2, 2012) are not relevant.[184] Costs for 11 mills (*i.e.*, costs for switching from CCA to HVLC compliance) where the CCA option may be negated due to the more stringent condensate removal standard (*e.g.*, 93 or 94 percent removal) were included in the revised cost analysis for the final rule. As stated elsewhere, we are not finalizing revisions to the kraft condensate standards.

132. Comment: Two other commenters (0212 and 0170) believed that EPA had underestimated the cost to implement the proposed rule changes. Both commenters referred to the information provided by commenter 0162 on the subject to support their argument. Commenter 0170 further argued that EPA's estimate at proposal of a $36 million industry-wide investment to upgrade condensate control system efficiencies was a significant underestimation. According to the commenter, the AF&PA's rough estimate, based on the incomplete understanding left by the proposal, indicates that the rule, which EPA determined would have a minor economic impact, could cost the industry as much as $2.4 billion dollars, an amount exceeding the costs of the air process portion of the original Cluster Rule and the combustion source rule (subparts S and MM). Even with this type of investment, it was not clear to the commenter whether the industry or their company could comply with all of the changes to the proposed rule because of cost and safety considerations. Given EPA's conclusion in the accompanying residual risk review that the industry presented acceptable risks, the commenter asserted that the prospect of billions of dollars of additional investment was unwarranted because it would not materially increase public protection.

Response: We interpret this comment as referring to costs associated with: (1) the proposed kraft condensate limits, and (2) our request for comment on the excess emissions allowances. Discussion of costs for the kraft condensate regulatory options is provided in the responses above. The EPA has decided not to revise the kraft condensate standards. The EPA has deferred action on the excess emissions allowances and will explore the costs associated with removal of the excess emission allowances in analyses supporting proposal of a future regulation.

133. Comment: Commenter 0172 argued that EPA is obligated to consider the cost of modifications during the RTR process. The cost of complying with the standards without the 1 percent, 4 percent, and 10 percent allowances must be considered. The commenter's initial assessment of the cost of complying with these standards at their facilities alone was between $100 and $180 million, primarily in the form of process modifications, alternative condensate and vent gas collection systems, backup condensate treatment systems and backup vent gas incineration systems.

Response: The EPA has deferred action on the excess emissions allowances and will further investigate how to address those provisions in a future regulation.

[184] See U.S. EPA document, titled *Meeting notes for the May 2, 2012 meeting with AF&PA.*

10. Miscellaneous Comments

10.1 Commenter Endorsements

134. Comment: Multiple commenters (0164, 0165, 0167, 0170, 0172, 0174, 0193, 0195, 0207, and 0212) endorsed the comments made by the AF&PA on the pulp and paper proposal. Five comments (0163, 0167, 0170, 0172, and 0212) also specifically endorsed the comments made by NCASI. Commenters 0170 and 0172 noted that they had also participated in the creation and/or review of the comments made by the AF&PA and NCASI.

Commenter 0164 specifically expressed support for the comments on the proposed SSM provisions that were submitted by the AF&PA. Rather than repeat those comments here, the commenter (0164) incorporated AF&PA's comments on the proposed SSM provisions into their comments by reference. Commenter 0163 specifically endorsed and submitted a copy (0163.2) of the February 18, 2012 interim comments provided by NCASI on RTR condensate treatment requirements.

Response: We acknowledge the commenters' collective support for the AF&PA and NCASI comments.

135. Comment: Commenter 0174 supported the article by the NCSAB entitled "Risk Assessment for Arsenic and Inorganic Arsenic Compounds" and provided a copy of the article.

Response: We acknowledge the commenter's reference to the article.

136. Comment: In support of their mills-specific NEI updates, several commenters (0154, 0187 (0187.3), 0190, and 0198) provided copies of the February 24, 2012 NCASI memorandum entitled "Hexachloroethane Emissions from Brownstock Washers and Bleach Plant Sources."

Response: We acknowledge the commenters' support for NCASI's HCE memo, which was summarized as Attachment 3 to comment 0162.

137. Comment: Commenter 0214/0225 endorsed the comments submitted by Earthjustice and coalition.

Response: We acknowledge the commenter's support for the Earthjustice (and coalition) comments.

10.2 Other Comments

138. Comment: Commenter 0170 suggested the EPA did not interpret mill ICR data correctly. The commenter stated that, without the familiarity with the process equipment and control systems that only company representatives could have, the EPA incorrectly interpreted the data. The commenter stated that they had suggested discussion with EPA, but they were not consulted in developing the proposal. The commenter believed substantial additional communication with EPA is needed to help interpret the data, the cost impact of the proposed provisions, the unrecognized adverse impacts that would result if the pulp and paper NESHAP

rule is promulgated (as proposed), and reasonable means for revising the standards. The commenter again offered to communicate with the Agency to whatever extent is needed to share understanding of these important matters.

Response: We appreciate the commenter's willingness to describe pulp and paper mill operations and to assist the Agency with future interpretations of the ICR data.

139. Comment: Commenter 0214/0214.1 provided 2009 reported air toxics releases for Nippon Paper Industries in Port Angeles, WA as additional input on typical reported emissions under present laws. The commenter noted that Nippon is regulated by Olympic Region Clean Air Agency.

Response: We thank the commenter for providing the inventory information for Nippon Paper. We compared the inventories with the NEI inventory used for our residual risk assessment and found that the HAP emissions in the inventories supplied by the commenter compare favorably with the NEI data. The NEI data set used for risk modeling included additional HAPs and in some cases a higher tonnage of selected HAPs.

140. Comment: Commenter 0225 provided a 2009 emissions inventory for Port Townsend Paper (see comment attachment 0225.1). The commenter noted that the TRI and the Regional Airs' Point Source Emissions Inventory are good tools for compiling and understanding emissions data, but data for many reported pollutants or point sources are elusive. The commenter pointed out that the inventories do not list several NESHAP pollutants for PTPC.

Response: We thank the commenter for providing the two inventories for PTPC. We compared the commenter's inventories with the NEI inventory used for our pre-proposal residual risk assessment and the NEI inventory that includes post-proposal NEI revisions from the mill. We found that the HAP emissions in the inventories supplied by the commenter compare favorably with the pre- and post-proposal NEI data. The pre- and post-proposal NEI data sets include additional HAPs not listed on the inventories supplied by the commenter. The commenter should also note that the TRI does not include emissions data for pollutants emitted below specified threshold levels.

141. Comment: Commenter 0214 attached a set of five documents (comment attachments 0214.1 through 0214.6) that the commenter believed illustrate a disconnect between enacted laws and how their actual enforcement plays out, or other areas for attention within the regulatory system. The commenter's Attachment B1 is a summary of State laws the commenter contended that the Washington Department of Ecology has refused to enforce. The commenter's Attachment B2 provides examples of misinformation to the public. The commenter's Attachments B3, B4, and B5 are 2008 letters calling for Washington Department of Ecology Industrial Section oversight of Port Townsend Paper. Commenter 0214 also attached a photo (comment attachment 0214.7) illustrating how the tops of Port Townsend Paper's stack point directly at the local hospital. Commenter 0214 also attached two documents in electronic form: (1) a petition regarding Port Townsend Paper (comment attachment 0214.8), and (2) complaint summary logs (comment attachment 0214.9). The commenter stated that the call logs that are on file with the Washington Department of Ecology relate accounts of heart palpitations, migraines, respiratory distress, burning eyes and skin, headaches, sinus and breathing problems, coughing,

nausea and vomiting, sleep apnea, and other sleep disturbances, along with daily inconveniences, such as having to change plans to avoid being in certain parts of town when the plume arrives. The commenter stated that it is notable that midway in the 6-month spreadsheet, Port Townsend Paper stopped recording the reasons for the calls after having already ceased to log what they did about it.

Response: We acknowledge this comment and the concerns of the commenter, but note that comments pertaining to enforcement or compliance issues at specific facilities are outside the scope of this rulemaking. We should note that the final rule requires repeat emission testing for kraft pulping processes and removes the SSM exemption–changes which should reduce the potential for the emissions episodes of concern to the commenter. We also note that section 304 of the CAA allows citizens to commence a civil suit against any person alleged to be in violation of "an emission standard or limitation under this chapter."

142. Comment: Commenter 0225 stated that the current environmental laws discourage upgrading until absolutely forced to, and much of the equipment at Port Townsend Paper is approaching the end of its design life. The commenter asserted that it is easier for the mill to begin a 25 megawatt (MW) power generating expansion than to upgrade existing technologies. The commenter encouraged MACT rules that would require the mills to install modern equipment, instead of relying on the best available retrofit technology (BART) options.

Commenter 0225 believed that tighter rules are necessary, but would be meaningless if not enforced. Because PTPC is a kraft pulp mill in the state of Washington, it is regulated by the Washington Department of Ecology's Industrial Section, rather than by the regional air quality authority, in contrast to other pulp mills. The commenter stated that the Department of Ecology coached the facility on ways to avoid PSD, which also allowed them to avoid MACT rules that otherwise would have been triggered by PSD.

Response: We acknowledge this comment and the concerns of the commenter, but note that comments pertaining to enforcement or compliance issues at specific facilities and issues pertaining to PSD are outside the scope of this rulemaking. It is expected that there would be some discussion between the permitting authority and an affected source's responsibilities with regard to permitting requirements.

143. Comment: Commenter 0225 expressed concern that CO_2 emissions data are not collected, as it is under the supervision of the Washington Department of Ecology Industrial Section rather than the regional air quality authority. Exemptions such as this should not be allowed. The commenter also noted that the 25 MW expansion project would lead to greatly increased CO_2 emissions, a contributing factor in climate change. The commenter estimated that the mill emits around 300 million pounds of CO_2 per year. The commenter noted that the expansion project may "more than double" the CO_2 emissions to 600 million pounds, yet that was not taken into account when approving the project--even though CO_2 emissions are a major issue.

Response: The reporting and collection of CO_2 emission data are outside the scope of the subpart S pulp and paper NESHAP. The current review of the subpart S NESHAP addresses

HAP emissions from subpart S emission sources, which does not include recovery furnaces or industrial boilers.

However, we note that biogenic and non-biogenic CO_2 emissions (and other GHGs) from the Port Townsend facility's recovery furnace and industrial boilers are required to be reported to EPA annually under EPA's Mandatory Greenhouse Gas Reporting rule (40 CFR part 98 subparts C and AA). Additionally, EPA is conducting a detailed examination of the science associated with biogenic CO_2 emissions from stationary sources, and this work is undergoing SAB review.

144. Comment: Commenter 0218 attached many of the documents referenced in their comment (*e.g.*, toxicity studies, background information). These documents are included as six file sets, items 0219.1 - 0224.18 in the docket.

Response: We acknowledge the referenced documents provided by the commenter.

Appendix A. Mills Providing NEI Revisions

NEI Code	Docket ID for NEI Revision	Nature of the NEI Revision
NEI13363	0147	Reduced acetaldehyde, formaldehyde from WWT
NEI54400	0151	-Reduced acetaldehyde, methanol from paper machine -Changed latitudes/longitudes for pulp operation, paper machines, hot water accumulator drain
NEI45206	0154	Deleted HCE from bleach plant, pulp storage
NEI26581	0155	-Deleted HCE from bleach plant and 2-methylnaphthalene from SDTs -Changed pollutant from hexachlorobenzene to hexachlorocyclopentadiene for SDTs
NEI42338	0158	Reduced acetaldehyde, chloroform, formaldehyde, 13 other HAPs from WWT
NEI6273	0159	-Increased acetaldehyde from paper machines, pulp dryer -Reduced acetaldehyde from WWT -Deleted records for non-operational boiler -Deleted carbon tetrachloride from paper machines, pulp dryer -Changed latitudes/longitudes for groundwood operations, NDCE recovery furnace, and boiler -Recommended change to receptor location
NEI11338	0166	-Reduced fugitive area of WWT -Reduced acetaldehyde from BLO unit and nickel from lime kiln -Deleted naphthalene from BLO unit -Changed latitudes/longitudes for WWT, BLO unit -Split up BLO unit emissions -Change release point type for BLO unit from vertical to vertical with rain cap
NEI42482	0169	-Reduced formaldehyde from EU BLT12 (Bleach Tower 2) -Replaced formaldehyde from EU BLT22 (Bleach Tower 2) with much lower estimate for EU BLT14 (Bleach Tower 4)
NEIWI4050324	0169	-Added vinyl acetate to dryformer -Reduced acetaldehyde from dryformer
NEI12980	0173	-Reduced stack velocity and increased stack diameter for Bleach Tower 1 -Increased stack velocity and reduced stack diameter for Bleach Tower 2
NEI40282	0174	-Reduced acetaldehyde, formaldehyde from paper machines -Reduced 1,2-dichloroethane from brownstock washing -Deleted 1,2-dichloroethane from oxygen delignification, lime kiln, boiler
NEI40686	0175	-Deleted HCE from bleach plant -Deleted acetaldehyde, chloroform, formaldehyde, methanol, 18 other HAPs from causticizing -Deleted acetaldehyde, acrolein, chloroform, formaldehyde, methanol, naphthalene, 28 other HAPs from SDT -Changed latitude/longitude for WWT -Recommended change to receptor location
NEI18652	0176	Reduced arsenic from boiler
NEI32869A	0177	-Reduced acetaldehyde, formaldehyde from paper machines, pulp dryer -Deleted HCE from bleach plant, pulp storage
NEI18373	0178	Reduced acetaldehyde from WWT
NEI40738	0179	-Reduced nickel from paper machine -Deleted acetaldehyde, methanol from papermaking fugitives -Recommended change to receptor location
NEI42695	0180	-Deleted antimony, beryllium, and cadmium from digester -Changed latitudes/longitudes for digester, decker, and ClO_2 generator -Recommended change to receptor location
NEI34066	0181/0191	-Increased fugitive area for WWT -Deleted HCE from bleach plant -Changed latitude/longitude for WWT

NEI Code	Docket ID for NEI Revision	Nature of the NEI Revision
NEI46739, NEI42963, & NEIWI7720116	0182	NEI46739: -Increased acetaldehyde, methanol, benzene, MIBK, toluene from causticizing miscellaneous -Reduced chloroform, formaldehyde, 7 other HAPs from causticizing miscellaneous -Deleted carbon tetrachloride and 1,1,2-trichloroethane from causticizing miscellaneous NEIWI7720116: -Reduced acetaldehyde, chloroform, formaldehyde, methanol, catechol, cresol, ethylene glycol, phenol from WWT -Recommended change to receptor location
NEI12407	0183	Deleted records for NCG incinerator (includes metals, formaldehyde, naphthalene)
NEI6261	0184	Reduced acetaldehyde, naphthalene, carbon disulfide, propionaldehyde from WWT
NEI41599	0185	Added bis(2-ethylhexyl) phthalete, dibutyl phthalate, toluene to WWTP1/2; formaldehyde to WWTP1; cresol, phenol to WWTP2 -Reduced acetaldehyde, methanol from WWTP1/2; formaldehyde from WWTP2 -Deleted HCE from bleach plant -Deleted acetaldehyde, chloroform, formaldehyde, methanol, naphthalene, 21 other HAPs from causticizing -Deleted acetaldehyde, acrolein, chloroform, formaldehyde, methanol, naphthalene, 28 other HAPs from SDT
NEI18338	0186	-Added ASB (includes acetaldehyde, carbon disulfide, chloroform, formaldehyde, methanol, naphthalene) -Reduced acetaldehyde, chloroform, formaldehyde, naphthalene from primary clarifier -Deleted methanol, HCE, and 17 other HAPs from primary clarifier
NEI18658	0187	-Reduced naphthalene, 10 other HAPs from bleach plant -Deleted HCE from brownstock washing, bleach plant, knotters, BLO unit
NEI46599	0188	-Reduced acetaldehyde, chloroform, formaldehyde, methanol, naphthalene, 27 other HAPs from brownstock washing, black liquor storage tanks -Increased stack temperature and velocity/flow for brownstock washing, SOG, pulp storage, oxygen delignification, black liquor tanks, causticizing, bleach plant, knotter, secondary fiber pulping when changed release point type -Changed release point type for brownstock washing and black liquor storage tanks from fugitive to vertical with rain cap -Recommended change to receptor location
NEI42211	0189	Changed latitudes/longitudes and fugitive angles for OCC plant and paper machine
NEI8186	0190	-Increased methylene chloride from LVHC -Reduced acetaldehyde, formaldehyde, chloroform, methanol from LVHC -Deleted records for causticizing miscellaneous, lime slaker (includes acetaldehyde, chloroform, naphthalene)
NEI8560	0190	-Deleted records for causticizing miscellaneous, lime slaker (includes acetaldehyde, chloroform, naphthalene) -Changed latitude/longitude and fugitive angle for WWT -Recommended change to receptor location
NEI8619	0190	Deleted records for causticizing miscellaneous, lime slaker (includes acetaldehyde, chloroform, methanol, naphthalene)
NEI11251	0190	-Replaced undifferentiated records for paper machine with new records for paper machine wet/dry end -Increased stack height for paper machines -Increased fugitive area for WWT -Deleted records for causticizing miscellaneous, lime slakers (includes acetaldehyde, chloroform, methanol, naphthalene) -Changed latitude/longitude for WWT
NEI18335	0190	-Deleted records for causticizing miscellaneous, lime slaker (includes acetaldehyde, chloroform, methanol, naphthalene) -Deleted HCE from bleach plant
NEI18357	0190	Deleted HCE from bleach plants

NEI Code	Docket ID for NEI Revision	Nature of the NEI Revision
NEI26309	0190	-Increased fugitive area for WWT (ASB) -Deleted HCE from bleach plant -Changed latitudes/longitudes for WWT (ASB, up/downstream ditches) -Changed fugitive angle for WWT (upstream ditch)
NEI26495	0190	Recommended change to receptor location
NEI26514	0190	-Reduced fugitive area of WWTP6 -Increased fugitive area for WWTP1-4 -Deleted records for causticizing miscellaneous, lime slaker (includes acetaldehyde, chloroform, methanol, naphthalene) -Deleted HCE from bleach plant -Changed latitudes/longitudes for WWTP1-4,6 -Changed fugitive angle for WWTP1,6
NEI33013	0190	Deleted records for causticizing miscellaneous, lime slaker (includes acetaldehyde, chloroform, methanol, naphthalene)
NEI33025 or NEW71411	0190	Deleted records for causticizing miscellaneous, lime slaker (includes acetaldehyde, chloroform, methanol, naphthalene)
NEI34070	0190	-Replaced undifferentiated records for paper machine with new records for paper machine wet and dry end -Increased stack height and stack velocity/flow for paper machine when replaced paper machine records with separate wet/dry end records -Deleted records for causticizing miscellaneous, lime slaker (includes acetaldehyde, chloroform, methanol, naphthalene, 15 other HAPs) -Changed latitude/longitude for paper machine when replaced paper machine records with separate wet/dry end records
NEI35908	0190	-Deleted records for causticizing miscellaneous, lime slaker, green liquor processing (includes acetaldehyde, chloroform, methanol, naphthalene) -Deleted HCE from bleach plant
NEI40247	0190/0227	-Added phenol to digester chip bin -Reduced acetaldehyde, formaldehyde, chloroform, methanol, and 16 other HAPs from digester chip bin -Deleted records for causticizing miscellaneous, lime slaker (includes acetaldehyde, chloroform, naphthalene, methanol) -Deleted HCE from bleach plant
NEI41314	0190	-Deleted records for causticizing miscellaneous, lime slaker (includes acetaldehyde, chloroform, methanol, naphthalene) -Deleted HCE from bleach plants -Deleted naphthalene from causticizing miscellaneous, LVHC, NCG incinerator, BLO unit -Deleted 8 HAPs from WWT -Changed latitude/longitude for WWT -Recommended change to receptor location
NEI41628	0190	-Deleted records for causticizing miscellaneous, lime slaker (includes acetaldehyde, chloroform, methanol, naphthalene) -Deleted HCE from bleach plant
NEI45182	0190/0227	-Added phenol to digester chip bin -Reduced acetaldehyde, formaldehyde, chloroform, methanol, and 16 other HAPs from digester chip bin and LVHC -Changed latitude/longitude for WWT
NEI46760	0190	-Deleted records for causticizing miscellaneous, lime slaker (includes acetaldehyde, chloroform, methanol, naphthalene) -Deleted HCE from bleach plants
NEI33883	0192	-Reduced acetaldehyde, formaldehyde, naphthalene from WWT -Changed fugitive angle for WWT -Recommended change to receptor location
NEI47104	0193	-Increased stack height, temperature, and velocity/flow for paper machine when changed release point type -Changed release point type for paper machines from fugitive to vertical point source

NEI Code	Docket ID for NEI Revision	Nature of the NEI Revision
NEI54342	0194	-Changed release point type for causticizing, pulp storage, black liquor tanks, brownstock washing, decker from fugitive to stack -Reduced stack height for some black liquor storage tanks -Increased fugitive release height and reduced fugitive area for other black liquor storage tanks -Increased stack height for causticizing (lime mud filter, lime slaker), pulp storage, decker -Increased stack temperature, diameter, and velocity/flow for causticizing, pulp storage, black liquor tanks, brownstock washing, decker when changed release point type
NEI41552	0195	Recommended change to receptor location
NEI18334	0197	-Reduced stack height for screens, lime mud filter, green liquor processing when changed their release point type from fugitive to stack -Increased formaldehyde, hexavalent chromium, 2 other HAPs from recovery furnace -Increased acetaldehyde, methanol, formaldehyde, metals, naphthalene, 5 other HAPs from SDT -Reduced velocity of NCG incineration -Added metals, chloroform, POM, toluene, hexane to recovery furnace -Added hexavalent chronkum, POM, 6 other HAPs to SDT -Increased stack height for SDT and multiple subpart S units (50) when changed their release point type from fugitive to stack -Reduced naphthalene from WWT -Reduced acetaldehyde, carbon tetrachloride, chloroform, formaldehyde, methanol, naphthalene, phenol, other HAPs from decker -Reduced acetaldehyde metals, methanol, naphthalene, 7 other HAPs from recovery furnace -Reduced chloroform, metals, 18 other HAPs from SDT -Increased stack temperature for SDT and multiple subpart S units (46) when changed their release point type from fugitive to stack -Increased stack velocity/flow for SDT and multiple subpart S units (55) (56 if include just stack flow of NCG incineration) when changed release point type -Deleted records for bleach plant, knotter, brownstock washing, digester, screens (accounted for elsewhere) and decker, causticizing miscellaneous, lime mud washer (no longer in service) (includes acetaldehyde, chloroform, formaldehyde, methanol, naphthalene) -Deleted HCE from bleach plants -Deleted HCl from recovery furnace -Changed release point type for SDT and multiple subpart S units (56) from fugitive to stack
NEI46817	0198	-Reduced nickel from boiler -Deleted HCE from bleach plants
NEI34030	0199	-Reduced stack height for mechanical pulping -Reduced stack velocity, flow for mechanical pulping -Replaced undifferentiated records for paper machine with new records for paper machine wet/dry end -Increased stack temperature for mechanical pulping -Increased stack velocity/flow for boilers -Changed latitude/longitude for paper machine when replaced paper machine records with separate wet/dry end records -Changed latitudes/longitudes for boilers
NEI26504	0200	Deleted records for recovery furnaces, SDTs (being replaced with new units, emissions data for which will not be ready until September 2012)
NEI7181	0201	Deleted HCE from bleach plant, LVHC, HVLC, recovery furnace, SDT, lime kiln
NEI18660	0202	-Reduced acetaldehyde from oxygen delignification -Deleted HCE from bleach plant -Deleted formaldehyde from pulp dryer -Recommended change to receptor location
NEI8265	0203	-Deleted HCE from bleach plant -Deleted toluene-2,4-diamine from black liquor storage tanks

NEI Code	Docket ID for NEI Revision	Nature of the NEI Revision
NEI47074	0204	- Replaced fugitive records for causticizing, paper machines with stack records for green liquor processing, paper machines -Increased stack height, temperature, diameter, and velocity/flow for paper machines when replaced fugitive paper machine records with stack records - Changed release point type for causticizing, paper machines from fugitive to stack -Changed latitudes/longitudes for paper machines -Changed brownstock washing to paper machine (SCC changed)
NEIME0250002	0205	-Reduced stack temperature of boilers -Replaced fugitive records for pressurized groundwood emission units with stack records (with lower emissions for acetaldehyde, formaldehyde, methanol, phenol, napthalene, *etc.*) -Increased stack height, temperature, velocity/flow of pressurized groundwood emission units when replaced them with stack equivalents -Increased stack height, diameter, velocity/flow of boilers -Changed release point type for pressurized groundwood emission units from fugitive to stack -Changed latitudes/longitudes for pressurized groundwood emission units and boilers -Recommended change to receptor location
NEI8178	0206	-Increased acetaldehyde, chloroform, methanol, toluene, biphenyl from decker -Replaced unconsolidated records for paper machines with new (consolidated) records -Added 10 HAPs to bleach plant, paper machines, decker -Reduced acetaldehyde, formaldehyde, chloroform, methanol, toluene, benzene, MIBK, carbon disulfide from WWT, decker -Deleted naphthalene from WWT and acrylonitrile from paper machines -Changed maximum hourly emissions
NEI40600	0209	-Replaced fugitive records for paper machines with stack records -Reduced acetaldehyde, formaldehyde, chloroform, methanol, 19 other HAPs from black liquor storage tanks
NEI8196	0210	-Increased stack heights for lime mud filter, lime slaker -Reduced acetaldehyde, naphthalene from WWT -Increased stack temperature and velocity/flow for lime mud filter when changed its release point type -Deleted toluene-2,4-diamine from black liquor storage tanks -Changed release point type for lime mud filter from fugitive to stack -Changed latitude/longitude for lime mud filter -Increased stack diameter for lime slaker
NEI40554	0211	-Increased stack temperature, diameter, and velocity/flow for HD/LD pulp storage when changed release point type -Changed release point type for HD/LD pulp storage from fugitive to horizontal point source
NEI33981	0213	-Reduced stack temperature of boilers -Increased stack height, diameter, and velocity/flow for boilers -Deleted duplicate HAP data from boilers (includes acetaldehyde, formaldehyde, naphthalene, metals, and 22 other HAPs) -Changed latitudes/longitudes for boilers
NEI11172	0217	-Reduced fugitive area of WWT -Reduced acetaldehyde from WWT -Changed latitude/longitude and fugitive angle for WWT -Changed fugitive angle for WWT
NEI7104	0226	-Added metals to boiler -Increased stack height for bleach plant, deckers -Reduced metals from boiler -Deleted methylene chloride and carbon disulfide from lime kiln
NEI47091	0230	-Increased acetaldehyde, formaldehyde, methanol, naphthalene, metals, 29 other HAPs from recovery furnace, SDT, lime kiln -Increased metals, HCl from boilers -Reduced metals, chloroform, 11 other HAPs from recovery furnace, SDT, lime kiln -Reduced metals from boilers -Deleted HCE from bleach plant, brownstock washing -Changed maximum hourly emissions for recovery furnace, SDT, lime kiln, boilers

NEI Code	Docket ID for NEI Revision	Nature of the NEI Revision
NEI7933	0232	-Increased stack diameter and velocity/flow for green liquor processing when changed release point type -Deleted chloroform and 10 other chlorinated HAPs from digester, pulp storage, LVHC, brownstock washing, secondary fiber pulping -Deleted o-cresol from brownstock washing, green liquor processes -Deleted o-xylene from pulp storage -Deleted biphenyl from paper machine -Changed release point type for green liquor processing -Changed latitude/longitude for pulp storage
NEI8261	0232	-Replaced records for PB5 and PB7 with updated records (that increase emissions) -Deleted 11 chlorinated HAPs from tall oil, pulp storage, black liquor tanks, brownstock washing, LVHC, screens, secondary fiber pulping, paper machines -Deleted biphenyl from secondary fiber pulping, paper machine -Deleted o-cresol from brownstock washing
NEI8278	0232	-Increased stack diameter and velocity/flow for green liquor processing, black liquor tanks, pulp storage when changed release point type -Deleted HCE from bleach plant -Deleted o-cresol from bleach plant, green liquor processing, brownstock washing, recovery furnace -Changed release point type for green liquor processing, black liquor tanks, pulp storage -Changed pollutant code for m,p-cresol
NEI11461	0232	-Replaced records for secondary clarifier and boiler with new records -Deleted biphenyl from secondary fiber pulping and paper machines -Changed latitudes/longitudes for primary/secondary clarifiers -Changed fugitive angle for secondary clarifier
NEI11610	0232	-Replaced records for paper machine with new records for all 12 vents on machine -Increased stack height, temperature, diameter, and velocity/flow for secondary fiber pulping, paper machines, space heaters when changed release point type -Changed release point type for secondary fiber pulping, paper machines, space heaters
NEI18347	0232	-Reduced fugitive area for primary/secondary clarifier -Replaced records for primary/secondary clarifier, ASB with new records (with revised fugitive angle) -Increased fugitive area for ASB -Deleted 9 chlorinated HAPs from HVLC -Deleted biphenyl from secondary fiber pulping -Deleted 11 chlorinated HAPs from SDT
NEI26304	0232	-Added records for primary clarifier, ASB -Deleted o-xylene, 4 chlorinated HAPs from pulp storage -Deleted biphenyl, methylene chloride from paper machine and secondary fiber pulping
NEI33023	0232	-Reduced fugitive area of primary clarifier, WWTP -Increased metals, PCB emissions from boilers -Added trivalent chromium, methanol, POM, PCBs, 11 other HAPs to boilers -Reduced metals emissions from boilers -Increased stack temperature, diameter, velocity/flow for stock chests when changed release point type -Deleted chloroform, 11 other chlorinated HAPs from brownstock washing, paper machine, secondary fiber pulping, NCG incinerator, pulp storage, tall oil -Deleted biphenyl from paper machine -Deleted o-cresol from green liquor processing -Deleted Be, Se from boiler -Changed release point type for stock chests -Reduced fugitive angle for primary clarifier -Increased fugitive angle for WWTP

NEI Code	Docket ID for NEI Revision	Nature of the NEI Revision
NEI42254	0232	-Replaced records for boilers with new records -Added total xylenes to screens, lime kiln -Increased stack height and temperature for evaporator/concentrator when changed release point type -Increased stack diameter and velocity/flow for evaporator/concentrator, green liquor processing when changed release point type -Deleted biphenyl from paper machines -Deleted o-cresol from bleach plant, green liquor processing, recovery furnace -Deleted o-xylene from tall oil, screens, lime kiln, recovery furnace -Changed release point type for evaporator/concentrator, green liquor processing
NEI42317	0232	-Increased stack diameter and velocity/flow for green/white liquor processing, pulp storage, black liquor tanks, lime slaker when changed release point type -Deleted 12 chlorinated HAPs from digester, brownstock washing, tall oil, pulp storage, evaporator/concentrator -Deleted o-xylene from pulp storage -Changed release point type for green/white liquor processing, pulp storage, black liquor tanks, lime slaker from fugitive to stack -Changed SCC from 30700122 (causticizing miscellaneous) to 30700132 (green liquor processing)
NEI45474	0232	-Deleted records for ClO_2 mixer (includes acetaldehyde, Cl_2, chloroform, formaldehyde, methanol) -Deleted HCE from bleach plants -Deleted o-xylene from pulp storage, recovery furnace -Changed fugitive angle for WWT
NEI42341A	0234	-Added chloroform to AST system (tanks 1-3) -Reduced chloroform from cooling towers, primary clarifier
NEI759	none	Deleted HCE from brownstock washing/HVLC
NEI6450	none	-Increased fugitive area for WWT and paper machines -Reduced acetaldehyde, formaldehyde emissions from paper machines -Changed latitudes/longitudes and fugitive angle for WWT, paper machines
NEI33135 & NEI706	none	-Increased stack height, temperature, velocity/flow for decker, knotter, pulp storage, black liquor tanks, causticizing when changed release point type -Reduced formaldehyde from white liquor processing -Deleted records for brownstock washing (emissions go to power boilers) (includes acetaldehyde, formaldehyde, methanol, carbon tetrachloride) -Changed release point type for decker, knotter, pulp storage, black liquor tanks, causticizing from fugitive to stack
NEI41552	none	-Reduced stack height and velocity for paper machines (3 records) -Increased acetaldehyde from paper machines (2 records) -Replaced fugitive records for black liquor tanks with replacement stack records (no change in emissions) (2 unique records) -Reduced acetaldehyde from paper machines (91 records) and ASB (1 record) -Increased stack velocity/flow of black liquor tanks (4 unique records) -Increased stack diameter for paper machines (3 unique records) and black liquor tanks (2 unique records) -Deleted acetaldehyde from primary settling basin -Changed release point type for black liquor tanks from fugitive to stack (3 unique records) -Changed latitude/longitude for ASB -Recommended change to receptor location -Changed SCC from 30700122 (causticizing miscellaneous) to 30700132 (green liquor processing)

NEI Code	Docket ID for NEI Revision	Nature of the NEI Revision
NEI42357	none	-Reduced acetaldehyde from ASB -Reduced acetaldehyde, metals, naphthalene from LK -Reduced arsenic from SDT -Reduced metals from boiler -Deleted acrolein, formaldehyde, acetaldehyde, naphthalene, methanol, 5 other HAPs from SDT -Reduced fugitive area and increased release temperature for ASB -Reduced stack diameter and calculated increased stack velocity for RF -Changed latitudes/longitudes for ASB, RF, SDT, LK, boiler