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40 CFR PART 52 STATE IMPLEMENTATION PLAN

AMENDMENT

STATE: OKLAHOMA

FRL# 3780-8

RULE PUBLISHED IN FR ON: 4/21/90

STATE MATERIAL RECEIVED BY SPU ON: 6/6

TAB: Q



**ROUTING AND TRANSMITTAL SLIP**

Date **5-31-90**

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. <b>Fran McDonald</b>		
2.		
3.		
4.		
5.		

Action	File	Note and Return
Approval	For Clearance	Per Conversation
As Requested	For Correction	Prepare Reply
Circulate	For Your Information	See Me
Comment	Investigate	Signature
Coordination	Justify	

**REMARKS**

Revised IBR material for  
 FRL-3780-8 (Oklahoma SIP)

Thanks

DO NOT use this form as a RECORD of approvals, concurrences, disposes, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
<b>Vickie Reed PM-223</b>	
	Phone No.
	<b>315-7204</b>

5041-102

• U.S. GPO 1988 — 801-758

OPTIONAL FORM 41 (Rev. 7-76)  
 Prescribed by GSA  
 FPMR (41 CFR) 101-11.808

OFFICE OF THE FEDERAL REGISTER

To: Vickie Reed  
From: Fran McDonald  
Date: May 18, 1990  
Subject: Oklahoma SIP FRL 3780-8

\*\*\*\*\*  
I am returning this SIP for the following reasons:

1. As I have indicated with the yellow tabs, the pages of the text of the OK regulation 3.7.5-4(h) are out of order. I would have straightened this out myself if I didn't need to send this back because of reason #2.

2. As I have indicated with the yellow tab, it appears that some pages are missing from the Staff recommendation concerning the application of Rockwell Tulsa for an alternative aerospace reasonably available control technology determination limit. Since the pages are not numbered I cannot tell if what I have is complete.

Thank you. If you have any questions please telephone me at 523-4534.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 HOSS AVENUE SUITE 1200

DALLAS TEXAS 75202-2733

May 25, 1990

REPLY TO: 6T-AP

MEMORANDUM

Subject: Oklahoma SIP FRL 3780-8; Tulsa County Ozone Plan; Direct Final Approval of Four Aerospace ARACT Plans

From: Gregg C. Guthrie *Gregg Guthrie*  
Environmental Engineer (6T-AP)

To: Vicki Reed (PM-223)

I apologize for getting the regulation pages out of order. I have rearranged them in the correct order.

Second there are no missing pages from the Rockwell Order. The Federal Register Attorney was concerned about sources # 247, 278, 249, 250, 251 and 252. Please review the two previous pages before the yellow tab and find that sources # 247, 249, and 250-252 do not exist in the inventory listing, therefore there are no paragraphs discussing such numbers. As for source # 278, its discussion may be found on the same page as the yellow tab.

I hope this explanation meets your and the Federal Register Attorney's needs. If there are any questions, please contact me at (FTS) 255-7214.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200

DALLAS, TEXAS 75202-2733

REPLY TO: 6T-AN

MEMORANDUM

SUBJECT: Submission of a Revision to the Oklahoma State Implementation Plan for Incorporation by Reference; Regulation 3.7.5-4(h) "Control of VOS Emissions from Aerospace Industries Coatings Operations" and four source specific alternate RACT determination Orders issued by the Oklahoma Commissioner of Health

FROM: Federal Register Office, EPA

TO: Office of the Federal Register

Please add this document to the "State of Oklahoma Air Quality Control Implementation Plan" file and tab it in the appropriate sequence.

Identification of Document

40 CFR Part 52, Subpart LL, is amended as follows:

SUBPART LL - OKLAHOMA

1. The Authority citation for Part 52 continues to read as follows:

AUTHORITY: 42 U.S.C. 7401-7642

2. Section 52.1920 is amended by adding paragraph (c)(36) to read as follows:

\* \* \* \* \*

(c) \* \* \*

(36) On March 9, 1990, the Governor submitted Oklahoma Air Pollution Control Regulation 3.7.5-4(h) "Control of VOS Emissions from Aerospace Industries Coatings Operations". This regulation was adopted by the Oklahoma Air Quality Council on December 5,

1989, and by the Oklahoma Board of Health on February 8, 1990. The regulation became effective when it was signed by the Governor as an emergency rule on February 12, 1990. Also on March 9, 1990, the Governor of Oklahoma submitted four source specific alternate RACT determination Orders issued by the Oklahoma Commissioner of Health for the Rockwell International, McDonnell Douglas-Tulsa, American Airlines and Nordam facilities in Tulsa County.

(i) Incorporation by reference

- (A) Oklahoma Air Pollution Control Regulation 3.7.5-4(h) "Control of VOS Emissions from Aerospace Industries Coatings Operations" as adopted by the Oklahoma Air Quality Council on December 5, 1989, and the Oklahoma Board of Health on February 8, 1990, and approved by the Governor on February 12, 1990.
- (B) Oklahoma Commissioner of Health Order issued and effective February 21, 1990, for Rockwell International, Tulsa approving an Alternate Reasonably Available Control Technology (ARACT).
- (C) Oklahoma Commissioner of Health Order issued and effective February 21, 1990, for McDonnell Douglas-Tulsa approving an Alternate Reasonably Available Control Technology (ARACT).
- (D) Oklahoma Commissioner of Health Order issued and effective February 21, 1990, for American Airlines approving an Alternate Reasonably Available Control Technology (ARACT).
- (E) Oklahoma Commissioner of Health Order issued and

**effective February 21, 1990, for Nordan's Lansing Street facility approving an Alternate Reasonably Available Control Technology (ARACT).**

**Attachments**



STATE OF OKLAHOMA

EXECUTIVE DEPARTMENT

APPROVAL OF ADOPTED EMERGENCY RULES

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WHEREAS, the Oklahoma State Board of Health (hereinafter Board) has the authority to adopt rules and regulations governing air pollution control; and

WHEREAS, the Board has adopted rules amending Regulation 3.7 of its rules titled "Oklahoma Air Pollution Control Regulations"; and

WHEREAS, the Board has found that compelling extraordinary circumstances require promulgation of these rules pursuant to 75 Okla. Stat. (1987 Supp.) Section 253 et seq.

NOW THEREFORE, I, Henry Bellmon by the authority conferred upon the office of Governor by the Constitution and laws of the State of Oklahoma, do hereby approve these rules for promulgation to be effective on this date.

Three copies of this approval shall be filed with the Oklahoma Department of Libraries. One copy each shall be filed by the Commission with the Speaker of the House of Representatives and the Senate President Pro Tempore.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of the State of Oklahoma to be affixed at Oklahoma City, Oklahoma this 12<sup>th</sup> day of February, 1990.

BY THE GOVERNOR OF THE STATE OF OKLAHOMA

Henry Bellmon

ATTEST:

Bruce T. Fisher  
Secretary of State

ASSISTANT SECRETARY OF STATE

RECEIVED

FEB 16 1990

PRESIDENT PRO TEM...

PERMANENT (EMERGENCY)  
OKLAHOMA AIR POLLUTION CONTROL REGULATIONS  
Oklahoma State Board of Health  
AUTHORITY: 63 O.S. 1981, Sections 1-1801 et seq., as amended.  
February 12, 1990

REGULATION 3.7

Control of Emissions of Organic Materials

~~3.7.1 General Provisions~~

~~3.7.1 (a) Purpose~~

~~(1) The purpose of this regulation is to control the emission of organic materials from stationary sources to protect and enhance the air quality to insure that the Oklahoma air quality standard is not exceeded and significant deterioration prevented.~~

~~3.7.1 (b) Definitions~~

~~(1) Acrylic - a chemical coating containing polymers or co-polymers of acrylic or substitute acrylic acid in combination with suitable resinous modifiers and its primary mode of cure is solvent evaporation.~~

~~(2) Alkyd Primer - a chemical coating composed primarily of alkyd applied to a surface to provide a firm bond between the substrate and any additional paint.~~

~~(3) Custom Product Finishes - a proprietary chemical coating designed for a specific customer and end use.~~

~~(4) Cutback Asphalt - a basic asphalt or asphaltic concrete containing a petroleum distillate.~~

~~(5) Effluent Water Separator - any tank, box, sump, or other container in which any material compound floating on or entrained or contained in water entering such tank, box, sump or other container is physically separated and removed from such water prior to outfall, drainage, or recovery of such water.~~

~~(6) Epoxy - a chemical coating containing epoxy groups and suitable chemical cross-linking agents. Epoxies prime mode of cure involves a chemical reaction between the epoxy and the cross-linking agent.~~

~~(7) Maintenance Finishes - a chemical coating formulated to form a protection of a given substrate to adverse chemical or physical condition.~~

~~monitoring shall include:~~

~~(i) Installation and maintenance of monitors to accurately measure and record operational parameters of all required control devices to ensure the proper functioning of these devices in accordance with design specifications, including:~~

~~(a) The exhaust temperature of direct flame incinerators and/or gas temperature immediately upstream and downstream of any catalyst bed;~~

~~(b) The total amount of volatile organic substances recovered by carbon adsorption or other solvent recovery system during a calendar month; and,~~

~~(c) The dates and reasons for any maintenance and repair of the required control devices and the estimated quantity and duration of volatile organic substance emissions during such activities;~~

~~(ii) Maintenance of records of any testing conducted at an affected facility in accordance with the provisions specified in subsection (a) above; and,~~

~~(iii) Maintenance of all records at the affected facility for at least two years and make such records available to representative of the State or local air pollution control agency upon request.~~

~~(10) Reporting and Recordkeeping The owner/operator of a facility subject to this Section shall submit to the Commissioner upon written request, reports detailing specific VOS sources; the quantity of coatings used for a specific time period, VOS content of each coating, capture and control efficiencies; and any other information pertinent to the calculation of VOS emissions. The data necessary to supply the requested information shall be retained by the owner/operator for a minimum of two years.~~

~~(11) The date of compliance with the requirements of this subpart will be December 31, 1990.~~

**3.7.5-4(h) Control of VOS Emissions from Aerospace Industries Coatings Operations**

**(l) Applicability**

**(A) This Section applies to all aerospace facilities located in Tulsa County. Sources once subject to this Section are always subject.**

**(B) This Section does not apply to individual coating formulations which when aggregated, do not exceed fifty-five (55) gallons per year for the facility.**

(C) New and modified sources and coating applications not included in the plan are subject to the permit requirements set forth in Regulation 1.4 and will be submitted to EPA as source-specific SIP revision, unless:

(i) The new coatings meet the presumption norm (3.5 pound VOS per gallon less water and exempt solvents limit); or,

(ii) The total usage of the new coating does not exceed fifty-five (55) gallons per year of each coating formulation.

(D) Exemptions to this rule shall be permitted for combined emissions at one site/facility which do not exceed a ten ton per year emission cut-off based on the potential of the facility to emit VOS from coatings operations.

**(2) Definitions**

(A) Aerospace means the industries, air bases and depots that manufacture aircraft or military components.

(B) Aircraft is any machine designed to travel through the earth's atmosphere. This group includes but is not limited to: airplanes, balloons, dirigibles, drones, helicopters, missiles, and rockets.

(C) Coating is a material, protective or decorative which covers a surface with a film which may alter the surface characteristics, and from which Volatile Organic Solvents can be emitted during the application and/or curing process.

(D) CTG means the Control Guidance Document "Control of Volatile Organic Emissions From Existing Stationary Sources, Volume VI: Surface Coatings of Miscellaneous Metal Parts and Products" EPA No. 450/2-78-015.

(E) Facility for the purposes of Section 3.7.5-4(h), means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person or persons under common control.

(F) Low Organic Solvent Coating (LOSC) means coatings which contain less organic solvent than the conventional coatings used by the industry. Low organic solvent coatings include water-borne, higher solids, electrodeposition and powder coatings.

(G) RACT, or Reasonable Available Control Technology, means the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.

(H) ARACT, or Alternate Reasonable Available Control Technology, means the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility as determined on a case-by-case basis.

**(3) General Requirements**

All affected facilities shall develop an emissions reduction plan as set forth below. Said plan, upon approval, shall constitute the determination of ARACT for that particular facility. ARACT must be installed and operating as approved in the plan no later than January 1, 1991 for existing facilities, unless additional phased compliance dates are otherwise approved in the plan. Provided, however, that in the case that Tulsa County is still non-attainment for ozone within five (5) years of approval of ARACT, the Emissions Reductions Plan and the ARACT determination shall be subject to review and modification.

**(4) Emissions Reduction Plan**

**(A) Each owner/operator shall develop an emissions reduction plan for all affected facilities. Each plan shall include the following:**

**(i) a detailed, reasoned and exhaustive review of (1) each source of emissions within the facility and (2) the entire plant collectively;**

**(ii) identification and quantification of emissions, in terms of pounds per day, of all organic solvents both before and after the application of ARACT;**

**(iii) a detailed, innovative engineering effort directed toward finding alternative air management schemes that can be incorporated in order to abate emissions at costs which are reasonable;**

**(iv) a consideration of the level of control that is achievable using available alternative coatings, to include for every application, low organic solvent coatings (LOSC);**

**(v) a consideration of the level of control achievable using available add-on control devices. This demonstration shall include, at a minimum, a demonstration of the feasibility/infeasibility of the following control options:**

**(a) carbon absorption,**

**(b) incineration/flaring,**

**(c) condensation, and**

- (d) a combination of (a) and (b) above;
- (vi) A consideration of facility redesign, including the following:
  - (a) recirculation,
  - (b) reduced air flows,
  - (c) consolidation of spray operations, and
  - (d) installation of common control devices for two or more separate coatings operations;
- (vii) A consideration of alternative applications, to improve transfer efficiency, including:
  - (a) high-volume-low-pressure spray equipment,
  - (b) heated spray guns, and
  - (c) electrostatic spray equipment/powder coatings;
- (viii) An explanation why each source is not a typical coating source covered by the CTG as defined in 3.7.5-4(h)(2)(D);
- (ix) A cost/benefit analysis for all control technology considered; and,
- (x) A detailed compliance schedule which includes the emission limit and/or control techniques for each emission source. This schedule, together with other relevant considerations, shall be set forth in a separate section of the plan which summarizes and outlines ARACT for the referenced facility.

(B) Upon completion, the emissions reduction plan shall be submitted in triplicate to the Air Quality Service. The preparer shall also submit a copy of the plan to Region VI Environmental Protection Agency (EPA), Region VI.

(C) Within 30 days of submittal, or of the effective date of this regulation, whichever is later, the Air Quality Service shall, considering any comments submitted by EPA either approve, modify or disapprove the plan.

(D) The Service shall, at the first meeting of the Air Quality Council following the approval, modification, or disapproval of the plan, present at public hearing, the staff's findings and ARACT determination. Upon consideration of comments and recommendations from the Council, the owner/operator of the

affected facility, the public and EPA, the Department shall, within ten (10) days after the public hearing, issue a final ARACT approval. Final approval shall constitute ARACT for the affected facility. The owner/operator shall be responsible for installation and operational provisions of the approved ARACT, including any specific provisions set forth therein. Any violation of the plan or of its provisions shall constitute a violation of this Regulation.

(E) Upon approval by the Department, the ARACT determination shall be submitted to EPA as a SIP revision.

(5) Reporting and Recordkeeping

(A) The owner/operator shall maintain the following,

(i) A material data sheet which documents the volatile organic solvent content, composition, solids content, solvent density and other relevant information regarding each coating and solvent available for use in the affected surface coating processes and information detailing the operational parameters of the coating process sufficient to determine continuous compliance with the applicable control limits. Information as to the amounts of each type coating used and the amounts of solvents used for dilution in each coating type shall be maintained for each coating operation. Daily usage records will be kept for all coatings used that do not comply with the applicable control limits specified in the plan.

(ii) Records shall be maintained of any testing conducted at an affected facility in accordance with the provisions specified in 3.7.5-4(h)(6).

(iii) Records required by Sections (i) and (ii) detailing VOS in pounds per gallon of coating (less water and exempt compounds) shall be calculated as follows:

$$\text{VOS in lbs/gal of coating} = \frac{W_v - W_w - W_x}{V_m - V_w - V_x}$$

where  $W_v$  = Weight of all volatiles,

$W_w$  = Weight of water,

$W_x$  = Weight of exempt solvent,

$V_m$  = 1 (one),

$V_w$  = Volume fraction of water,

$V_x$  = Volume fraction exempt solvent.

(iv) Records required by Sections (i) and (ii) of this rule shall be maintained for at least two years and shall be made available upon written request by representatives of the Air Quality Service, U.S. Environmental Protection Agency or the Tulsa City-County Health Department.

(B) Alternatively to Subsection (A) above, an equivalent recordkeeping provision which satisfies the substantive requirements of (A) may be approved under the plan.

**(6) Testing and Monitoring**

(A) Each owner/operator shall, upon a determination by the Air Quality Service that testing is required to establish emissions from any particular source or sources, conduct such tests at his own expense. Test methods may include 1-4, 18, 24, 24A, 25A, 25B found in Appendix A of 40 CFR Part 60, including the procedures found at 40 CFR 60.444.

(B) Monitoring shall be required of any owner/operator subject to this Section who uses add-on control equipment for compliance. Such monitoring shall include:

(i) Installation and maintenance of monitors to accurately measure and record operational parameters of all required control devices to ensure the proper functioning of those devices in accordance with design specifications, including;

(a) the exhaust temperature of direct flame incinerators and/or gas temperature immediately upstream and downstream of any catalyst bed,

(b) the total amount of volatile organic substances recovered by carbon adsorption or other solvent recovery system during a calendar month, and,

(c) the dates and reasons for any maintenance and repair of the required control devices and the estimated quantity and duration of volatile organic substance emissions during such activities,

(ii) Maintenance of records of any testing conducted at an affected facility in accordance with the provisions specified in Subsection (a) above; and,

(iii) Maintenance of all records at the affected facility for at least two years and make such records available to representatives of the State or local air pollution control agencies upon request. (3.7.5-4(h) Effective 2-12-90)



ROCKWELL INTERNATIONAL  
TULSA, OKLAHOMA

DETERMINATION OF ALTERNATE, REASONABLY  
AVAILABLE CONTROL TECHNOLOGY (ARACT)  
FINAL APPROVAL

In accordance with the terms and provisions of Oklahoma Air Pollution Control Regulation 3.7.5-4(h), and upon recommendation of the State Air Quality Council, Alternate RACT For Rockwell Tulsa, as set forth in the attached Staff Recommendation Concerning The Application of Rockwell Tulsa for an Alternate Aerospace Reasonably Available Control Technology Determination Limit, is hereby APPROVED. Compliance with the emission limits set forth therein must be achieved no later than January 1, 1991 except as specified under the Standards Section of this ARACT determination.

Done this 21 Day of Feb, 1990.

John Drake Chief, Air Quality Service

Mark Coleman Deputy Commissioner  
for Environmental Health  
Services

John K. Leavitt, MD Commissioner of Health

February 13, 1990

**STAFF RECOMMENDATION CONCERNING THE APPLICATION OF  
ROCKWELL INTERNATIONAL, TULSA  
FOR AN ALTERNATE AEROSPACE COATING, REASONABLY AVAILABLE  
CONTROL TECHNOLOGY DETERMINATION LIMIT UNDER REGULATION  
3.7.5-4(h).**

**I BACKGROUND**

1. Rockwell Tulsa, began operations in Tulsa in 1962. The Tulsa operation is part of the North American Aircraft Division of Rockwell International. The company is involved in the manufacture of aero-structures for commercial and military customers. The company works on a contract basis, with the contracts, acquired by competitive bid. As a part of the operation, the company is involved in the coating of various subassemblies. These operations are carried on throughout the facility.
2. The company operates the Tulsa plant on a two shift per day, five day per week, fifty-two week per year schedule. There are, however, certain operations which vary from this schedule. The various sources at the plants operate on an intermittent schedule. That is, they may only operate a partial shift each day. The sources do not run at capacity. The plant builds metallic and non-metallic structures for its various customers. Currently the operation is split on roughly 70% metallic, 30% non-metallic. The Tulsa plant is also involved in the production of parts for the NASA program as well as other programs which require them to build parts which travel outside the earth's atmosphere. Rockwell also contracts with foreign aircraft manufacturers.
3. During the summer of 1987, the Air Quality Service met with the various industries located in Tulsa County which coat metal products and parts. These meetings were held preparatory to promulgation of a VOS regulation by the State. Subsequent to numerous public hearings, a source-specific approach was proposed at the October 1989 meeting of the Air Quality Council. This approach, known as Alternative Reasonably Available Control Technology (ARACT), was approved by the Council and recommended to the Board of Health.
4. Rockwell Tulsa is comprised of several sources, 21 being listed in the 1988 emissions inventory. Of the 21 sources listed, 12 sources would be affected under Alternate RACT. Of these 12, only 8 are CTG sources and consequently considered under a CTG type plan. One of

these sources, the Maintenance Paint Booth, will be controlled by the CTG. The listing below is taken from Rockwell's ARACT submittal and further breaks down the coating sources.

SOURCE	DESCRIPTION	TPY VOS
233	Maintenance Paint Booth	.725 *
239	Hammer House Paint Booth	.671
256	Fabrication of Radar Absorbent Materials	2.50 **
257	RAM Core Area (Honeycomb)	8.37 **
258	Final Paint Area (4 Booths)	12.15
259	Chemical Milling Maskant Paint Booth	1.72 ***
241	General Use Paint Booth	4.14
242	Metal Bonding Primer Booth	10.10
243	Bonding Primer Cure Oven	1.01
244	Flew Line Paint Booth	8.50
246	Dry Filter Paint Booth	3.2
253	General Use Final Assembly Paint Booth	6.75
267	I.R. & D. Booth	3.0
268-274	RAM Booths	7.35
275-278	KSC Booths	5.63
279-280	CP Booth	1.96
281-282	I.R. & D. Booth	1.8
283-285	Thin Film Dip	0.5
286	Screen Print	0.5
287-288	Mix Room	0.75

\* Subject to the provisions of 3.7.5-4(g).

\*\* These sources have been deactivated, the work done

here has been moved to other sources.

\*\*\* This source is currently controlled by carbon adsorption.

These sources comprise two plants at the Tulsa facility. Sources 233, 239, 258, 259, and 268-288 are located at the Air Force Plant 3, Sources 241 thru 246, and 253 are located at the Mingo Facility. The other buildings which Rockwell currently inhabits do not have sources which are covered by the provisions of 3.7.5-4(g) or (h).

## II SOURCE BY SOURCE ANALYSIS

241 General use paint booth, Building 605. This booth uses several paint finishes. There is only one coating used in this booth which could be replaced by a compliant coating. The company intends to use a compliant primer. They also plan to move the minor maskant operations to the chem-mill booth.

The cost of control on this booth is prohibitive. The emissions from this source will be reduced from 4.12 TPY to 1.75 TPY. This is accomplished by reducing the VOS content of coatings where possible, and moving some operations to other areas.

242 and 243 Bond prime paint booth and cure oven, Building 605. This source utilizes only bond primer and wipe solvents. This booth cannot be combined with others due to contamination problems. There are no compliant coatings available, and the cost of control is prohibitive. The company has proposed no changes in their current operation of this source.

244 and 245 Flew line, Building 605. This is a conveyerized system which is dedicated to non-metallic structures. The source utilizes several coatings, the only coatings which are available in compliant formulations are some of the primers. Costs for control of this source are very high, and consolidation with other sources is not practical. This source will reduce emissions through the use of low VOC technology. Current emissions are 8.50, proposed emissions will be 7.97.

246 Dry filter paint booth, Building 604. This booth utilizes several coatings, some of which will be replaced by compliant coatings. The majority of the coatings utilized here will be replaced with compliant versions. The remaining coatings make the use of control equipment very costly. This source currently has emissions of 3.25 TPY; after the use of compliant coatings where possible, emissions will be 2.51 TPY.

253 General use final assembly paint booth, Building 610. This area consists of six point sources, enclosed to create four separate paint booths. There are several coatings used in this complex, only one of them is available in a compliant version. Due to the low volume of coatings used here, add-on controls are not feasible. The combination of this source with others is not possible due to size of products coated and the complexity of the coating process. This source will not see any reductions in the alternate plan.

258A, B, C, D, Final paint area. Detail parts painting and subassembly painting, Building 119. This source is comprised of four paint booths, and two ovens. This combination of booths utilizes a wide variety of coatings. Some of the coatings utilized here will be replaced with compliant versions. This area has been consolidated and does not lend itself to further consolidation. This source is proposed to have a 2.25 TPY reduction.

259 Chem-mill maskant paint booth, Building 119. This source utilizes a carbon adsorption system, as a means of control. It is not possible due to the nature of the coatings used here to combine this source with any others. This source currently emits 1.72 TPY, after the Alternate RACT is applied it will emit at a slightly higher rate of 2.01 TPY due to consolidation of other chem-mill operations into this unit.

267 I. R. & D. Building 64. This area is a prototype development source, the activities which are carried on in this area are in direct support of other areas of the facility. Due to the nature of the source the emissions from this area are very low, with no substitute coatings available. The costs for controlling this source are very high, and not considered to be economically feasible.

268, 269, 270, 271, 272, 273, 274 RAM system, Building 64. This source is a state-of-the-art source, it is not common to other aerospace plants. Due to the process itself, and the uniqueness of the source, combining with other sources is not possible. There are no compliant coatings which are available, and the costs of control are too great.

275, 276, 277, 278 ESC process, Building 64. This group of sources produces a coating which is made up of several applications of material, which forms a conductive sheet which when cured is glued to the exterior of an aircraft. This source is not a candidate for consolidation due to its nature, it would either contaminate or be contaminated by the source it is combined with. There is only one coating supplier for this material, and no known compliant coatings are available. The cost to control this source would be prohibitive.

279, 280 C.P. Process, Building 64. These two sources apply conductive coatings to fiberglass substrates. These sources are robotically operated and are unique to Rockwell. Consolidation of this source is not possible due to the nature of the coating used. There is only one coating manufacturer for this type of coating, and no compliant version is available or expected to become available. The costs of controlling this source would be prohibitive.

281, 282 RAM I R & D, Building 64. This area is used to develop the prototypes for the RAM process. This area does developmental work for the long range projects which are carried out in the RAM System Line. There are no other coatings which can be used in this system. The emissions from this source are very low, and the costs for control would be prohibitive.

283, 284, 285 Thin Film Dip, Building 64. This process utilizes a dip coating and oven cure of plastic parts. These parts are coated with an electric effect coating. This process is not capable of being consolidated, any dust particles contaminate the coating and causes the product to be unfit for the intended purpose. The control of this source is not cost-effective, the high transfer efficiency of the dip coating most likely offsets the reductions which could be economically imposed.

286 Screen print booth, Building 64. This system is used much the same as silk screen printing operations, the process is used to place conductive pathways on various substrates. The process produces very few emissions, and controls for this source would be costly. The consolidation of this process with any others is not possible due to the possibility of contamination.

287, 288 Mix room, Building 64. This area is used to mix the coatings which will be used in the RAM and ESC production areas. The emissions from this area are fugitive in nature. This area is simply a mixing room, it works in support of the RAM and ESC booths. There are no paint booths in this area. This area would not be controlled by the CTG. Costs of control for this area are extremely high, due to the requirements of exhausting the entire area. The combining of this source with others is not feasible, the mixes developed here are easily contaminated and must remain separate to insure product usability.

#### Costs for Control

RACT The costs for controlling under the Miscellaneous Metal Products and Parts CTG are by the staff analysis, \$3,240,810.00. This would effect control on those areas of the plant which deal with metal parts. It would leave uncontrolled those sources which deal with composite parts.

The CTG approach would effect approximately 32 tons per year of emissions. Rockwell has predicted that the cost per ton of reduction in their plant would be in excess of \$41,000.00. Because of the complex nature of the aerospace sources, and the extreme costs, the State has developed a regulation which allows for Alternate RACT.

**ARACT** The State has developed an approach under the ARACT which allows the aerospace companies to develop a program which represents in the view of the company, and the State the best control program available to the company based on, real reductions and reasonable costs. Rockwell, has proposed such a plan, and it has been reviewed by the State and EPA. The plan calls for reductions across the plant, it is applicable to metal, non-metal coating as well as the exterior of aircraft. The company has submitted figures which predict the cost of the controls outlined in their plan to be approximately \$9,500.00 per ton of VOS removed. The staff has determined that this is a reasonable plan for the control of the facility.

### III FINDINGS

1. Tulsa County is in an area which has been issued a SIP call by EPA to correct certain deficiencies in the State plan for attaining and maintaining the ozone standard.
2. The Air Quality Council has been authorized to develop and recommend regulations for the improvement of air quality. In this activity, they are to consider all facets of the regulations which are being developed. These duties include a responsibility to determine if the regulation under consideration is cost-effective and in the best interest of the State.
3. Rockwell Tulsa is located in an area designated as not attaining the standard for the pollutant ozone.
4. On December 5, 1989, the Air Quality Council approved, for recommendation to the Board of Health, revocation of the existing Section 3.7.5-4(h) of Regulation 3.7, concerning aerospace in Tulsa. A new Section 3.7.5-4(h) was approved which would allow ARACT for the affected industries. This Regulation was approved by the Board of Health on February 8, 1990 and approved by the Governor as an emergency on February 12, 1990. The facility must be in compliance with the limits by January 1, of the applicable year as listed in the Standards Section, i.e., 1991 and 1993.
5. Rockwell is subject to the provisions of Regulation 3.7.5-4(h) which contemplates either compliance with the 3.5 pounds per gallon requirement of the CTG or the submittal of a source-specific compliance plan.

6. The plan contemplated by Regulation 3.7.5-4(h) was submitted by Rockwell and was reviewed by the staff of the Air Quality Service. The results of that review are contained herein.
7. The staff finds that Rockwell has complied with all of the provisions of 3.7.5-4(h) in the submittal of their plan and that ARACT is not only appropriate but is fully justified by Rockwell in their Alternate RACT Determination consisting of the following documents:
  - (a) Rockwell's October 30, 1989 submittal entitled Rockwell International NAA-Tulsa Alternate RACT Determination, October 30, 1989.
  - (b) Supplement of November 22, 1989, which outlines the responses to the written questions posed to Rockwell by the staffs of the Air Quality Service, Tulsa City County Health Department and EPA.
  - (c) Supplement of January 1, 1990, which outlines the company's response to the alternate reporting requirements of Regulation 3.7.5-4(h).

#### IV RECOMMENDATIONS \*

The Staff Recommendations for Rockwell are:

1. That the Alternate RACT for Rockwell as presented by the staff be adopted by the Department.
2. That the staff proposal be recommended, by the Council, to the Department as the Alternate RACT for Rockwell Tulsa's facilities.
3. That the documents presented by Rockwell as their Alternate RACT Determination on October 30, 1989 be accepted as the basis for the limits set for its facilities.
4. That the Alternate RACT order be forwarded to EPA as a SIP revision.
5. The staff recommendation for Alternate RACT is set forth below. It applies only to the Rockwell Tulsa facilities in existence on the date of the complete plan submittal.

\* The Staff recommendations were approved by the Air Quality Council with minor modifications. The ARACT as set forth in Section V contains changes, as heard at public hearing February 13, 1990, and as recommended by the Staff and Council.



**V ALTERNATE RACT FOR ROCKWELL TULSA.**

After consideration of the Rockwell submittals of October 30 and November 22, 1989 and January 1, 1990, the Department finds the following requirements to be appropriate alternate control for Rockwell Tulsa.

**DEFINITIONS**

- A. COATING is a material protective or decorative which covers a surface with a film which may alter the surface characteristics and from which Volatile Organic Solvents can be emitted during the application and/or curing process.**
- B. ADHESIVE BONDING PRIMER is a coating applied in a very thin film that provides corrosion protection and prepares surfaces for adhesive bonding.**
- C. FLIGHT-TEST COATING is a coating other than a standard production coating which is applied to an aircraft prior to flight testing to protect the aircraft from corrosion and to provide required markings during flight test evaluation.**
- D. FUEL-TANK COATING is the coating applied to the interior of a fuel tank of an aircraft to prevent corrosion.**
- E. CHEMICAL MILLING MASKANT is a temporary production coating applied directly to an aerospace metal part to protect surface areas from any damage (including mechanical and environmental) during manufacturing operations such as chemical milling, anodizing, plating, etching, aging, bonding or riveting.**
- F. PRIMER is a surface coating applied for the purposes of adhesion of subsequent coatings. Domestic primers are primers utilized on structures manufactured for non-military customers, incorporated in the United States. Foreign commercial primers are primers utilized on structures manufactured for non-military customers, incorporated in other countries.**
- G. PHOSPHATE ESTER RESISTANT COATING is a coating which is resistant to phosphate ester-based hydraulic oil.**
- H. SOLID FILM LUBRICANT is a coating consisting of a binder system containing as its chief material one or more of the following: molybdenum disulfide, graphite, polytetrafluorethylene, lauric acid, cetyl alcohol, waxes or other solids that act as a dry lubricant between faying surfaces.**
- I. SPACE-VEHICLE is a vehicle designed to travel and**

function beyond the earth's atmosphere.

- J. **SPACE-VEHICLE COATINGS** are coatings applied to space-vehicles.
- K. **SPECIALTY COATINGS** are coatings having specific, highly functional uses. They include reflective coatings, infrared absorbent coatings, EMI shield coatings, electric or radiation effect and other low observable coatings, fire retardant coatings, impact resistant coatings, temperature sensitive coatings, and rain erosion coatings.
- L. **TEMPORARY PROTECTIVE COATING** is a coating applied to an aerospace component to protect it from mechanical damage during handling, transportation or assembly.
- M. **TOPCOAT** is a coating applied for purposes or appearance, identification or protection. Coatings which are sandwiched between a primer and a topcoat are considered to be topcoats. A coating which is not formulated as a primer, and which is applied directly to a part as both an initial and final coating is considered as a topcoat. Pigmented topcoats contain materials to give the coating a final color. Clear topcoats contain no pigments.
- N. **PRETREATMENT COATINGS** are low solids coatings containing reactive substances to etch the base metal being coated.
- O. **ANTI-CHAFE COATINGS** are abrasion resistant coatings applied to structures that are susceptible to damage from part movement.
- P. **CONDUCTIVE COATINGS** are coatings that conduct electrical current. This group includes coatings that are utilized to dissipate static electricity.
- Q. **SEALANTS** are materials utilized to fill voids to protect against corrosion.
- R. **SURFACE CONDITIONERS** are materials utilized to reduce surface porosity, fill voids and pin holes in non-metallic structures.
- S. **HIGH TEMPERATURE COATINGS** are coatings that must withstand temperatures greater than 350 degrees F.
- T. **VOLATILE ORGANIC SOLVENTS (VOS)** are any organic compounds which participate in atmospheric photochemical reactions; that is, any organic compound other than those which the EPA Administrator designates as having negligible photochemical reactivity. VOS may be measured by the VOC reference method, an equivalent method, an alternate method or by procedures specified under 40 CFR Part 60.

**STANDARD**

The maximum amount (pounds) of VOS per gallon of coating (less water and exempt compounds) as discharged to the atmosphere while coating parts, is as follows:

<b>COATING</b>	<b>JAN 1991</b>	<b>JAN 1993</b>
<b>Primers</b>		
<b>Domestic Commercial</b>	3.0	
<b>Foreign Commercial</b>	5.4	
<b>Military</b>		
<b>Navy</b>	3.0	
<b>Air Force Except B-1</b>	6.0	
<b>Air Force B-1</b>	3.0	
<b>Topcoats Commercial</b>		
<b>Pigmented</b>	5.2	3.5
<b>Clear</b>	5.7	3.5
<b>Topcoats Military</b>		
<b>Pigmented</b>	5.2	
<b>Clear</b>	5.7	
<b>Adhesive Bond Primer</b>	6.8	
<b>Fuel Tank Coatings</b>	6.1	
<b>Chem-Mill Maskants</b>	1.0	
<b>Solid Film Lubricants</b>	6.5	
<b>Space-Vehicle Coatings</b>	6.5	
<b>Specialty Coatings</b>	6.8	
<b>Temporary Protective Coatings</b>	2.5	
<b>Pre-treatment Coating</b>	6.2	
<b>Anti-chafe Coatings</b>	5.5	
<b>Conductive Coatings</b>	6.5	

Surface Conditioners	5.0
Sealants	4.5
High Temperature Coatings	6.5

#### **CLEAN UP SOLVENTS**

Solvent containing materials used for the cleanup of coating equipment shall be considered when determining compliance with the emissions limits, unless:

- (1) The solvent containing materials are maintained in a closed container when not in use;
- (2) Closed containers are used for the disposal of cloth or paper or other materials used for surface preparation and cleanup;
- (3) The application equipment is disassembled and cleaned in a solvent vat and the vat is closed when not in use; or,
- (4) Solvent containing materials sprayed through the application equipment are collected and placed in a closed container.

#### **ALTERNATE STANDARD**

In lieu of complying with the individual coating limits set forth in the standard, Rockwell Tulsa may comply through the use of add-on control equipment. The use of add-on control equipment will be contingent upon the equipment chosen demonstrating that it is at a minimum equivalent to the level of control achieved by the use coatings which meet the standard of 3.5 pounds VOS per gallon (less water and exempt solvents) and meet an overall control efficiency of at least 85%. Companies may use individual coating formulations, which when aggregated, do not exceed 55 gallons per year per facility.

New coatings, are required to meet the permitting requirements of the State. New coatings used in quantities less than 55 gallons per coating per facility per year are exempt from the ARACT plan requirements. New coatings which meet at least a 3.5 pound per gallon VOS limit or have control equipment which is equivalent to at least a 3.5 pound VOS per gallon (less water and exempt solvents) and meet an overall control efficiency of at least 85 percent control are not required to be reported as a part of the ARACT Plan for the facility.

#### **EXEMPTIONS**

1. Coatings applied by swabs on subassembly and assembly operations are exempt.
2. Coatings applied by aerosol spray cans in subassembly and assembly operations are exempt.
3. Coatings used in the research and development of specialized military applications are exempt provided;
  - (i) The coating is not an integral part of the production process; and,
  - (ii) The emissions from the coating do not exceed 800 pounds in any calendar month.

#### **REPORTING AND RECORD-KEEPING**

Rockwell has chosen to maintain its records in the following manner as allowed by 3.7.5-4(h)(5)(B). Rockwell shall maintain the following:

- (1) A material data sheet which documents the volatile organic solvent content, composition, solids content, solvent density, and other relevant information detailing the operational parameters of the coating process sufficient to determine CONTINUOUS compliance with the applicable control limits.
- (2) Rockwell will utilize its existing master inventory system to identify all coating consumption and amounts of dilution solvents in each coating type, using daily entries to update on a quarterly basis, based on Rockwell's fiscal year, which begins 09 October and ends 30 September.
- (3) Daily entries will identify each paint formulation and VOS emissions from each coating formulation, by source, and will be tabulated and maintained in a quarterly report;
- (4) VOS emissions will be tabulated based on the maximum thinning permitted by specification;
- (5) Rockwell will develop and implement a master approval system to assure that booth by booth records are kept for all coatings which are not in the Alternate RACT Plan;
- (6) Records shall be maintained of any testing conducted at an affected facility in accordance with the provisions specified in 3.7.5-4(h)(6);

- (7) Records shall be maintained to adequately demonstrate compliance with the provisions of 3.7.5-4(h)(1)(A) and 3.7.5-4(h)(1)(C)(ii), and Exemption 3 of this order.
- (8) Records required by Sections (1) through (7) of this order shall be maintained for at least two years and shall be made available upon written request by representatives of the Air Quality Service, the U.S. Environmental Protection Agency or the Tulsa City-County Health Department.

#### TESTING AND MONITORING

- (A) Rockwell Tulsa shall, upon a determination by the Air Quality Service that testing is required to establish emissions from any particular source or sources, conduct such tests at his own expense. Test methods may include 1-4, 18, 24, 24A, 25A, 25B found in Appendix A of 40 CFR Part 60, including the procedures found at 40 CFR 60.444.
- (B) Monitoring shall be required of Rockwell Tulsa if it chooses add-on control equipment as the method for compliance. Such monitoring shall include:
  - (1) Installation and maintenance of monitors to accurately measure and record operational parameters of all required control devices to ensure the proper functioning of those devices in accordance with design specifications, including;
    - (a) the exhaust temperature of direct flame incinerators and/or gas temperature immediately upstream and downstream of any catalyst bed,
    - (b) the total amount of volatile organic substances recovered by carbon adsorption or other solvent recovery system during a calendar month, and,
    - (c) the dates and reasons for any maintenance and repair of the required control devices and the estimated quantity and duration of volatile organic substance emissions during such activities,
  - (2) Maintenance of records of any testing conducted at an affected facility in accordance with the provisions specified in Subsection (A) above; and,
  - (3) Maintenance of all records at the affected facility

for at least two years and make such records available to representatives of the State or local air pollution control agencies upon request.

AMERICAN AIRLINES  
TULSA, OKLAHOMA

DETERMINATION OF ALTERNATE REASONABLY  
AVAILABLE CONTROL TECHNOLOGY (ARACT)  
FINAL APPROVAL

In accordance with the terms and provisions of Oklahoma Air Pollution Control Regulation 3.7.5-4(h), and upon recommendation of the State Air Quality Council, Alternate RACT For American Airlines, as set forth in the attached Staff Recommendation Concerning the Application of American Airlines, Tulsa, Oklahoma, for an Alternate Aerospace Reasonably Available Control Technology Determination Limit, is hereby APPROVED. Compliance with the emission limits set forth therein must be achieved no later than January 1, 1991 except as specified under the Standards Section of this ARACT determination.

Done this 21 Day of Feb, 1990.

John G. Dyala Chief, Air Quality Service

Mark J. Coleman Deputy Commissioner  
for Environmental Health  
Services

John K. Lawitt, MD Commissioner of Health



February 13, 1990

**STAFF RECOMMENDATION CONCERNING THE APPLICATION OF  
AMERICAN AIRLINES, TULSA  
FOR AN ALTERNATE AEROSPACE COATING, REASONABLY AVAILABLE  
CONTROL TECHNOLOGY DETERMINATION LIMIT UNDER REGULATION  
3.7.5-4(h).**

**I BACKGROUND**

1. American Airlines M&E Center began operations at this facility in 1946. This facility is a major maintenance and repair facility. This base has served this function for American Airlines' fleet of aircraft, which currently includes a total of 200 aircraft. These consist of Boeing 727's, 767's, and Mc Donnell Douglas MD 80's, DC 10's. The base is also responsible for the routine repair and maintenance of nine hundred jet engines. This facility differs from the normal aerospace industry in that it has a primary function of maintenance. In this function, they carry out all recalls by the FAA, as well as the scheduled maintenance called for by the original manufacturer. As a part of the overall maintenance function, the base is required to re-coat various parts of the aircraft, this includes the exterior of the aircraft in some cases. The maintenance on the fleet of aircraft is accomplished in hangars, the hanger may have several docks at which aircraft are serviced.
2. The company operates the Tulsa plant on a two shift per day, five day per week, fifty-two week per year schedule. There are, however, certain operations which vary from this schedule. The various sources at the plant operate on an intermittent schedule. That is, they may only operate a partial shift each day. The sources do not run at capacity. The plant is responsible for the maintenance of the American Airlines fleet of aircraft, along with the new sister plant in Fort Worth, Texas, they perform the entire maintenance function. The Tulsa facility uses coatings which have been prescribed by the original manufacturer and approved for use by the FAA. Due to the liability of using coatings which differ from those which have been approved for use by the original manufacturer, the company is locked into a set of coatings. American, does, however utilize application methods which achieve in certain applications high transfer efficiency.
3. During the summer of 1987, the Air Quality Service met with the various industries, located in Tulsa County,

which coat metal products and parts. These meetings were held preparatory to promulgation of a VOS Regulation by the State. Subsequent to numerous public hearings, a source-specific approach was proposed at the October 1989 meeting of the Air Quality Council. This approach, known as Alternate Reasonably Available Control Technology (ARACT), was approved by the Council and recommended to the Board of Health.

4. American Airlines is comprised of sixteen sources, eight of which use coatings as part of their operation. The coating sources are located in various buildings throughout the facility. The sources are located to support the various classes of aircraft maintained by the base, as a result the coating which occurs may not be covered by the Metal Products and Parts CTG. The staff had estimated that of the 70.8 tons reported in the 1988 emissions survey, only 31.1 tons would be considered under the CTG. Some of the 31.1 tons, reported in the inventory were used to coat non-metallic parts, and a larger portion was used to coat the exterior of aircraft. In American Airlines ARACT submittal these sources were further broken down, the listing which appears below is taken from that submittal.

SOURCE	DESCRIPTION	TPY VOS
5-1	MD-80 Paint Booth	3.2
5-2	DC-10/767 Paint Booth	2.45
5-3	(Misc) Nosecones, etc.	6.3
5-4	Landing Gear Paint Booth	.96
5-5	Composite Shop Paint Booth	1.36
5-6	727 Aircraft Paint Booth	7.99
5-7	Ground Support Equipment	2.68*
5-8	Thrust Reverser Paint Booth	1.17
5-9	Interior Shop Paint Booth	4.1
5-10	Seat Shop Paint Booth	.912
	Fugitive Usage	27.0

\* Subject to the provisions of 3.7.5-4(g).

These Sources are located in nine buildings on 270 acres.

There are sources which are considered to be fugitive located in all of the hanger docks. There is one source which is considered to be covered by the provisions of Regulation 3.7.5-4-(g). This source is located in the plant maintenance building, it is used to paint various items. The operations of this source are not limited to metal, it is used to paint or coat wood and various other substrates.

## II SOURCE BY SOURCE ANALYSIS

The State has developed an approach under the ARACT Regulation which allows the aerospace companies to develop a program which represents, in the view of the company and the State, the best control program available based on, real reductions and reasonable costs. American Airlines, has proposed such a plan, and it has been reviewed by the State and EPA. The plan calls for reductions across the plant, it is applicable to metal, non-metal coating as well as the exterior of aircraft. The company has submitted figures which predict the cost of the controls outlined in their plan to be approximately \$10,000.00 per ton of VOS removed. The staff has determined that this is a reasonable plan for the control of the facility.

The analysis which is presented here is based upon the materials which were submitted by the company. This is an abbreviated summary, further details are contained in the submittals referenced in earlier sections of this document.

5-1 MD-80 Paint Booth, Shop Number 220-2. This booth would be partially applicable under the CTG, some of the parts coated here are not metallic. Under the ARACT proposal of American Airlines, the entire operation of the booth would be covered. This is an aircraft support booth, as such it coats parts of the MD-80 fleet these parts consist of metallic and non-metallic structures. The location of the paint booth in the vicinity of the aircraft is crucial to the operation, this booth only services the aircraft which are docked at this hanger.

The cost of control of this source are considered to be prohibitive. The total emissions from this source in 1988 were 3.18 TPY, the projected emissions in 1991 will be 3.00 TPY. These reductions will be from the use of coatings which are low in VOS. The company has projected no add-on controls for this source.

5-2 DC-10/767 Paint Booth, Shop Number 225-3,4. These booths support the aircraft dock for the DC-10 and the 767. The paint booths coat metallic and non-metallic structures. The CTG would apply to these booths in a limited manner due to the parts which are coated. The 1988 emissions from this

source were 2.45 TPY, the emissions estimate for this source in 1991 is 1.87 TPY. The emission reductions for this source will be accomplished through the use of low VOS coatings. No add-on control is contemplated for this source.

The costs for controlling this source with its intermittent use and low VOS loading are considered to be prohibitive. The consolidation of this source with others is not possible due to physical constraints imposed by the layout of the facility.

5-3 Miscellaneous Paint Booth, Shop 272-3. This paint booth coats many non-metallic structures. There are a few metallic parts done here so the CTG style regulation would be partially applicable. The 1988 tonnages for this source were 6.31 TPY. The proposed Alternate RACT would project emissions of 4.68 TPY. The reductions in emissions for this source are due to the use of compliant coatings where possible.

Costs for control of this source are very high, the difference between the control level of the CTG and the ARACT do not justify the costs. This booth is not a candidate for consolidation due to the size of the items coated and the inability to move this source to other areas of the facility. The other existing sources are not close enough to combine with this source.

5-4 Landing Gear Paint Booth, Shop 272-5. This paint booth is responsible for the specialized coating of landing gear, it is used exclusively for this purpose. This booth uses a highly specialized coating, however, some reductions in the VOS content of the coatings used here will be made. The 1988 emissions inventory tonnages for this source were .96 TPY, the projected 1991 emissions are .784 TPY.

The cost of controlling this source is very high, primarily due to the low level of VOS emitted from this source, and the intermittent nature of the operations. This source is not a candidate for inclusion in another area, due to the types of coatings used, and the nature of the operation which is performed on these parts.

5-5 Composite Shop Paint Booth, Shop 272-5. This booth is associated with the fabrication of metallic and non-metallic panels. This booth applies a specialized coating to the panels to cause the surfaces to adhere to each other. The emissions from this area are expected to rise slightly from the 1988 level of 1.35 TPY. The company has projected the emissions from this source to be approximately 1.37 TPY in 1991. Compliant versions of this coating are not available to American Airlines at this time.

This shop does not lend itself to being combined with others

because of the type of coating used in the operation of bonding the structures developed here. Combination of this source with others would lead to the contamination of the coatings used in this shop and the possible failure of the product during flight. The cost of control of this source is great, the level of emissions and the level of activity produce a situation which does not lend itself to control.

5-6 727 Aircraft Paint Booth, Shop 222-2, 3. These booths coat parts which are associated with the 727 aircraft dock. The parts which are coated here would not always be applicable to the CTG. There are a combination of metallic and non-metallic parts which require coating in support of this type of aircraft. The emissions from this source are predicted to be 3.72 TPY, a reduction from the 1988 level of 7.99 TPY as reported in the company's emissions survey. The reductions which are projected are due to the use of low solvent coatings.

The costs incurred for control of this booth are similar to those seen in the other areas of the facility. The control of this booth would be expensive, and is not considered a feasible option. The inclusion of this source with others is not possible due to its support role for the 727 aircraft dock.

5-7 Ground Support Equipment Paint Booth, Shop 292-0. This source is covered by the provisions of 3.7.5-4(g). This shop is responsible for the coating of ground support equipment, plant equipment and various other activities. Some of the coating which is done in this area is on materials which are not covered by the Regulation. This area with a 1988 emissions level of 2.68 TPY is not considered to be a candidate for control. The company has projected the emissions level in 1991 to be 2.64 TPY.

This source is not suitable for consolidation, due to the nature of the work performed here, and the variety of coatings used. The shop will use compliant coatings where possible and will most likely achieve control levels equivalent to those possible with control equipment on the metallic coating portion of the operation.

5-8 Thrust Reverser Paint Booth, Shop 236-1. This shop refurbishes the air dams that reverse jet thrust as air brakes. The coatings used in this shop are of a specialized nature. They must withstand the high temperatures of the jet engine exhaust. The company has proposed to reduce the emissions from this source by the use of compliant coatings where possible. The 1988 level of emissions from this source were 1.17 TPY, the projected level in 1991 is .92 TPY.

Consolidation of this shop with others is not possible due to the layout of the facility. The costs of control on this

shop are considered to be prohibitive.

5-9 Interior Shop Paint Booth, Shop 271-3,4,8. The items coated by this shop are primarily from the interior of the aircraft. Many of the parts are non-metallic structures and thus would not be covered by the CTG. The emissions from this shop were 4.1 TPY as reported in the 1988 survey, projections of the 1991 emissions are 3.03 TPY.

The costs of controlling the emissions from this area are very high, this is partially due to the low volume of metallic part coating which is done, as well as the relatively low emissions from this source. The company proposes the use of compliant coatings where possible to limit the VOS emissions at this source.

5-10 Seat Shop Paint Booth, Shop 271-5. This shop coats metallic and non-metallic parts. The emissions from this shop in 1988 were .91 TPY, the projected 1991 emissions are .86 TPY. The use of compliant coatings is proposed as the means of control for this source.

Costs for the control of this source by the use of add-on control equipment are very high. The level of emissions and the VOS concentrations do not lend themselves to a cost-effective control program. This source is not proposed to be consolidated with other sources.

Miscellaneous Fugitive Paint Usage. The facility is such that there is a lot of painting which does not occur in paint booths. Much of the painting which is done is on the exterior of the aircraft, such as touch up of small abraded areas. Some of the painting is done on what would be considered the interior of cavities in the aircraft, this may be to repair an area which is found to be corroded or causing some type of problem. In the instances where this type of activity is occurring it is not possible to remove the part to a paint booth to coat it, and the activity is carried out at the aircraft dock. This type of activity accounted for 27.11 TPY in the 1988 emissions inventory. The company has projected the use of high transfer efficiency methods where possible, and the use of compliant coatings where possible for control of these emissions. The 1991 emissions have been projected to be 23.07 TPY.

### III FINDINGS

1. Tulsa County is in an area which has been issued a SIP call by EPA to correct certain deficiencies in the State plan for attaining and maintaining the ozone standard.
2. The Air Quality Council has been authorized to develop and recommend regulations for the improvement of air quality. In this activity, they are to consider all

facets of the regulations which are being developed. These duties include a responsibility to determine if the regulation under consideration is cost-effective and in the best interest of the State.

3. American Airlines, Tulsa, is located in an area designated as not attaining the standard for the pollutant ozone.
4. On December 5, 1989, the Air Quality Council approved, for recommendation to the Board of Health, revocation of the existing Section 3.7.5-4(h) of Regulation 3.7, concerning aerospace in Tulsa. A new Section 3.7.5-4(h) was approved which would allow ARACT for the affected industries. This Regulation was approved by the Board of Health on February 8, 1990 and approved by the Governor as an emergency on February 12, 1990. The facility must be in compliance with the limits by January 1, of the applicable year as listed in the Standards Section, i.e., 1991 and 1993.
5. American Airlines is subject to the provisions of Regulation 3.7.5-4(h) which contemplates either compliance with the 3.5 pounds per gallon requirements of the CTG or the submittal of a source-specific compliance plan.
6. The plan contemplated by Regulation 3.7.5-4(h) was submitted by American Airlines and was reviewed by the staff of the Air Quality Service. The results of that review are contained herein.
7. The staff finds that American Airlines has complied with all of the provisions of 3.7.5-4(h) in the submittal of their plan and that ARACT is not only appropriate but is fully justified by American Airlines in their Alternate RACT Determination consisting of the following documents:
  - (a) American Airlines October 30, 1989 submittal entitled American Airlines Tulsa Alternate RACT October 30, 1989.
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#### IV RECOMMENDATIONS \*

**The Staff Recommendations for American Airlines are:**

1. That the staff proposal be recommended, by the Council, to the Department as the Alternate RACT American Airlines Tulsa facilities.
2. That the Alternate RACT for American Airlines as presented by the staff be approved by the Department.
3. That the documents presented by American Airlines as their Alternate RACT Determination on October 30, 1989 be considered as the basis for the limits set for its facilities.
4. That the Alternate RACT determination be forwarded to EPA as a SIP revision.
5. The staff recommendation for Alternate RACT is set forth below. It applies only to the American Airlines Tulsa facilities in existence on the date of the complete plan submittal.

\* The Staff recommendations were approved by the Air Quality Council with minor modifications. The ARACT as set forth in Section V contains changes, as heard at public hearing February 13, 1990, and as recommended by the Staff and Council.

**V ALTERNATE RACT FOR AMERICAN AIRLINES TULSA.**

After consideration of the American Airlines submittals of October 30, and November 22, 1989 and January 2, 1990, the Department finds the following requirements to be appropriate alternate control for American Airlines, Tulsa.

**DEFINITIONS**

- A. **COATING** is a material protective or decorative which covers a surface with a film which may alter the surface characteristics and from which Volatile Organic Solvents can be emitted during the application and/or curing process.
- B. **ADHESIVE BONDING PRIMER** is a coating applied in a very thin film that provides corrosion protection and prepares surfaces of aerospace components for adhesive bonding.
- C. **FUEL-TANK COATING** is the coating applied to the interior of a fuel tank of an aircraft to prevent corrosion.
- D. **CHEMICAL MILLING MASKANT** is a temporary production coating applied directly to an aerospace metal part to protect surface areas from any damage (including



mechanical and environmental) during manufacturing operations such as chemical milling, anodizing, plating, etching, aging, bonding or riveting.

- E. PRIMER is a surface coating applied for the purposes of adhesion of subsequent coatings.
- F. PHOSPHATE ESTER RESISTANT COATING is a coating which is resistant to phosphate ester-based hydraulic oil.
- G. SPECIALTY COATINGS are coatings having specific, highly functional uses that do not belong to other categories. They include reflective coatings, infrared absorbent coatings, EMI shield coatings, electric or radiation effect and other low observable coatings, fire retardant coatings, impact resistant coatings, temperature sensitive coatings, anti-chafe coatings, and rain erosion coatings.
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- M. TOPCOAT is a coating applied for purposes of appearance, identification or protection. Coatings which are sandwiched between a primer and a topcoat are considered to be topcoats. A coating which is not formulated as a primer, and which is applied directly to a part as both an initial and final coating is considered as a topcoat.
- K. VOLATILE ORGANIC SOLVENTS (VOS) are any organic compounds which participate in atmospheric photochemical reactions; that is, any organic compound other than those which the EPA Administrator designates as having negligible photochemical reactivity. VOS may be measured by the VOC reference method, an equivalent method, an alternate method or by procedures specified under 40 CFR Part 60.

#### STANDARD

The maximum amount (pounds) of VOS per gallon of coating (less water and exempt compounds) that American Airlines may discharge to the atmosphere while coating parts, is as follows:

COATING	JAN 1991	JAN 1993
Primers	3.0	
Primers, roller brush	3.5	
Phosphate ester-resistant primer	3.0	

Polyurethane topcoats	3.5	
Lacquer topcoats	6.5	3.5
Epoxy topcoats	6.5	3.5
Adhesive Bond Primer	6.8	
Fuel Tank Coatings	6.1	
Specialty Coatings	7.0	3.5
Clear coatings	4.3	3.5

#### CLEAN UP SOLVENTS

Solvent containing materials used for the cleanup of coating equipment shall be considered when determining compliance with the emissions limits, unless:

- (1) The solvent containing materials are maintained in a closed container when not in use;
- (2) Closed containers are used for the disposal of cloth or paper or other materials used for surface preparation and cleanup;
- (3) The application equipment is disassembled and cleaned in a solvent vat and the vat is closed when not in use; or,
- (4) Solvent containing materials sprayed through the application equipment are collected and placed in a closed container.

#### ALTERNATE STANDARD

In lieu of complying with the individual coating limits set forth in the standard, American Airlines may comply through the use of add-on control equipment. The use of add-on control equipment will be contingent upon the equipment chosen demonstrating that it is at a minimum equivalent to the level of control achieved by the use coatings which meet the standard of 3.5 pounds VOS per gallon (less water and exempt solvents) and meet an overall control efficiency of at least 85%. Companies may use individual coating formulations, which when aggregated, do not exceed 55 gallons per year per facility.

New coatings, are required to meet the permitting requirements of the State. New coatings used in quantities

less than 55 gallons per coating per facility per year are exempt from the ARACT plan requirements. New coatings which meet at least a 3.5 pound per gallon VOS limit or have control equipment which is equivalent to at least a 3.5 pound VOS per gallon (less water and exempt solvents) and meet an overall control efficiency of at least 85 percent control are not required to be reported as a part of the ARACT Plan for the facility.

#### **EXEMPTIONS**

1. Coatings applied by swabs on subassembly and assembly operations are exempt.
2. Coatings applied by aerosol spray cans in subassembly and assembly operations are exempt.
3. The applications of coatings, as described in items one and two above, apply to the exterior of assembled aircraft, when the coating operations are carried out as a part of the normal maintenance function.

#### **REPORTING AND RECORD-KEEPING**

American Airlines has chosen to maintain its records in the following manner as allowed by 3.7.5-4(h)(5)(B). American Airlines shall maintain the following:

- (1) A material data sheet which documents the volatile organic solvent content, composition, solids content, solvent density, and other relevant information detailing the operational parameters of the coating process sufficient to determine CONTINUOUS compliance with the applicable control limits.  
  
(2) American Airlines will utilize its existing master inventory system to identify all coating consumption and amounts of dilution solvents in each coating type, using daily entries to update on a quarterly basis, based on American Airlines's fiscal year, which begins 01 January and ends 31 December.
- (3) Daily entries will identify each paint formulation and VOS emissions from each coating formulation, by source, and will be tabulated and maintained in a quarterly report;
- (4) VOS emissions will be tabulated based on the maximum thinning permitted by specification;
- (5) American Airlines will develop and implement a

master approval system to assure that booth by booth records are kept for all coatings which are not in the Alternate RACT Plan;

- (6) Records shall be maintained of any testing conducted at an affected facility in accordance with the provisions specified in 3.7.5-4(h)(6);
- (7) Records shall be maintained to adequately demonstrate compliance with the provisions of 3.7.5-4(h)(1)(A) and 3.7.5-4(h)(1)(C)(ii);
- (8) Records required by Sections (1) through (7) of this order shall be maintained for at least two years and shall be made available upon written request by representatives of the Air Quality Service, the U.S. Environmental Protection Agency or the Tulsa City-County Health Department.

#### TESTING AND MONITORING

- (A) American Airlines shall, upon a determination by the Air Quality Service that testing is required to establish emissions from any particular source or sources, conduct such tests at his own expense. Test methods may include 1-4, 18, 24, 24A, 25A, 25B found in Appendix A of 40 CFR Part 60, including the procedures found at 40 CFR 60.444.
- (B) Monitoring shall be required of American Airlines if it chooses add-on control equipment as the method for compliance. Such monitoring shall include:
  - (1) Installation and maintenance of monitors to accurately measure and record operational parameters of all required control devices to ensure the proper functioning of those devices in accordance with design specifications, including;
    - (a) the exhaust temperature of direct flame incinerators and/or gas temperature immediately upstream and downstream of any catalyst bed,
    - (b) the total amount of volatile organic substances recovered by carbon adsorption or other solvent recovery system during a calendar month, and,
    - (c) the dates and reasons for any maintenance and repair of the required control devices and the estimated quantity and duration of volatile organic substance emissions during such activities,

- (2) Maintenance of records of any testing conducted at an affected facility in accordance with the provisions specified in Subsection (A) above; and,
- (3) Maintenance of all records at the affected facility for at least two years and make such records available to representatives of the State or local air pollution control agencies upon request.

**NORDAM INCORPORATED  
TULSA, OKLAHOMA**

**DETERMINATION OF ALTERNATE REASONABLY  
AVAILABLE CONTROL TECHNOLOGY (ARACT)  
FINAL APPROVAL**

In accordance with the terms and provisions of Oklahoma Air Pollution Control Regulation 3.7.5-4(h), and upon recommendation of the State Air Quality Council, Alternate RACT For Nordam, as set forth in the attached Staff Recommendation Concerning the Application of Nordam for an Alternate Aerospace Reasonably Available Control Technology Determination Limit, is hereby APPROVED. Compliance with the emission limits set forth therein must be achieved no later than January 1, 1991 except as specified under the Standards Section of this Alternate RACT determination.

Done this 21 Day of Feb, 1990.

John Drake Chief, Air Quality Service

Mark Coleman Deputy Commissioner  
for Environmental Health  
Services

John K. Leavitt, M.D. Commissioner of Health

February 13, 1990

**STAFF RECOMMENDATION CONCERNING THE APPLICATION OF  
NORDAM, TULSA  
FOR AN ALTERNATE AEROSPACE COATING, REASONABLY AVAILABLE  
CONTROL TECHNOLOGY DETERMINATION LIMIT UNDER REGULATION  
3.7.5-4(h).**

**I BACKGROUND**

1. Nordam began operations in Tulsa in 1969. The company is comprised of Nordam, the parent company, and its affiliate companies, Lori, TK International, Aero Tech United and World Aviation Associates. Nordam's activities include the remanufacture of flight control surfaces, radomes, acrylic and glass transparencies, heat exchangers and oil coolers for commercial aviation, general aviation, helicopter and military aircraft. Nordam is also capable of manufacturing panels, custom interiors, acrylic transparencies, heat exchangers, oil coolers and a wide range of composite structures. The only facility which Nordam or the affiliate companies operate which is subject to this determination is the Lansing Street facility. The Pine street and Lori plants are not considered as a part of this plan. The Lori plant is currently controlled, and the Pine street facility is well below the exemption limit in Regulation 3.7.5-4(h).
2. The company operates the Tulsa plant on a one shift per day, five day per week, fifty-two week per year schedule. There are, however, certain operations which vary from this schedule. The various sources at the plant operate on an intermittent schedule. That is, they may only operate a partial shift each day. The sources do not run at capacity. The plant builds metallic and non-metallic structures for its various customers. Currently the operation is split on roughly 70% metallic, 30% non-metallic.
3. During the summer of 1987, the Air Quality Service met with the various industries located in Tulsa County which coat metal products and parts. These meetings were held preparatory to promulgation of a VOS regulation by the State. Subsequent to numerous public hearings, a source-specific approach was proposed at the October 1989 meeting of the Air Quality Council. This approach, known as Alternative Reasonably Available Control Technology (ARACT), was approved by the Council and recommended to the Board of Health.
4. Nordam is comprised of several sources, 5 being listed in the 1988 emissions inventory. Of the 5 sources listed,

3 sources would be affected under Alternate RACT. Of these 5, all are CTG sources and consequently considered under a CTG type plan. The listing below is taken from Nordan's ARACT submittal and further breaks down the coating sources.

	SOURCE	DESCRIPTION	TPY VOS
1.	General Purpose Paint Booth		3.8 +
2.	General Purpose Paint Booth		3.5 +
3.	Heat Insulation Paint Booth		0.28

+ These numbers are estimates, the plant was moved in late 1989.

## II SOURCE BY SOURCE ANALYSIS

The State has developed an approach under the ARACT Regulation which allows the aerospace companies to develop a program which represents, in the view of the company and the State, the best control program available based on, real reductions and reasonable costs. Nordan, has proposed such a plan, and it has been reviewed by the State and EPA. The plan calls for reductions across the plant, it is applicable to metal, non-metal coating as well as the exterior of aircraft. The company has submitted figures which predict the cost of the controls outlined in their plan to be approximately \$10,000.00 per ton of VOS removed. The staff has determined that this is a reasonable plan for the control of the facility.

The analysis which is presented here is based upon the materials which were submitted by the company. This is an abbreviated summary, further details are contained in the submittals referenced in earlier sections of this document.

1. General Purpose Paint Booth, Number 1. This booth is responsible for the coating of various parts, these may be metallic or non-metallic. The booth uses primers and topcoats as its primary coatings, however, there may be from time to time other coatings used here. The majority of the coating done in this booth is general, with varying sizes and structures being coated. This booth has been in operation only a short time, therefore, the data on the coatings used is limited. The company has projected the use of compliant coatings for this booth in its Alternate RACT. This booth was not considered for consolidation due to the level of activity occurring here.



The costs for using compliant coatings as the means for control of this booth are not available due to the limited data. It is apparent that the costs would be in the \$10,000 per ton range. The level of emissions coupled with the size of the booth dictate the use of low VOS coatings as the control method, add-on controls would increase the costs to an even higher level.

2. General Purpose Paint Booth, Number 2. This booth is identical to the booth above, therefore, the same data applies here.
3. Heat Insulation Paint Booth. This booth applies a specialty coating to parts which acts as a sound deadener and a heat insulator. The actual VOS emissions from this source cannot be stated due to the short amount of time the plant has been in this location. The projected emissions for 1989 from this source are .28 TPY. The plant has increased its activity in this sector, and anticipates the emissions to increase for this source.

The cost of controlling this booth is high due to the level of emissions and the physical size of the booth. The company has chosen to use compliant coatings as the means of control in this booth.

NOTE: Nordam has recently moved their operations from a facility on Pine Street, to a plant on Lansing Street. The operation at the Pine Street plant was larger and involved more paint booths. Nordam will be required to obtain permits for the booths which are now out of service prior to putting them back into service.

### III FINDINGS

1. Tulsa County is in an area which has been issued a SIP call by EPA to correct certain deficiencies in the State plan for attaining and maintaining the ozone standard.
2. The Air Quality Council has been authorized to develop and recommend regulations for the improvement of air quality. In this activity, they are to consider all facets of the regulations which are being developed. These duties include a responsibility to determine if the regulation under consideration is cost-effective and in the best interest of the State.
3. Nordam is located in an area designated as not attaining the standard for the pollutant ozone.
4. On December 5, 1989 the Air Quality Council approved, for recommendation to the Board of Health, revocation of the existing Section 3.7.5-4(h) of Regulation 3.7 concerning aerospace in Tulsa. A new Section 3.7.5-4(h) was

approved which would allow ARACT for the affected industries. This Regulation was approved by the Board of Health on February 8, 1990 and approved by the Governor as an emergency on February 12, 1990. The facility must be in compliance with the limits by January 1, of the applicable year as listed in the Standards Section. i.e. 1991 and 1993.

5. Nordam is subject to the provisions of Regulation 3.7.5-4(h) which contemplates either compliance with the 3.5 pounds per gallon requirements of the CTG or the submittal of a source-specific compliance plan.
6. The plan contemplated by Regulation 3.7.5-4(h) was submitted by Nordam and was reviewed by the staff of the Air Quality Service. The results of that review are contained herein.
7. The staff finds that Nordam has complied with all of the provisions of 3.7.5-4(h) in the submittal of their plan and that ARACT is not only appropriate but is fully justified by Nordam in their Alternate RACT Determination consisting of the following documents:
  - (a) Nordam November 29, 1989 submittal entitled Source Specific RACT Determination.
  - (b) Supplement of January 10, 1990, which outlines the responses to the written questions posed to Nordam by the staffs of the Air Quality Service, Tulsa City-County Health Department and EPA.

#### IV RECOMMENDATIONS \*

The Staff Recommendations for Nordam are:

1. That the staff proposal be recommended, by the Council, to the Department as the Alternate RACT for Nordam.
2. That the Alternate RACT for Nordam as presented by the staff be approved by the Department.
3. That the documents presented by Nordam as their Alternate RACT Determination on November 29, 1989 be considered as the basis for the limits set for its facilities.
4. That the Alternate RACT determination be forwarded to EPA as a SIP revision.
5. The staff recommendation for Alternate RACT is set

forth below. It applies only to the Nordam facilities in existence on the date of the complete plan submittal.

\* The Staff recommendations were approved by the Air Quality Council with minor modifications. The ARACT as set forth in Section V contains changes, as heard at public hearing February 13, 1990, and as recommended by the Staff and Council.

#### **V ALTERNATE RACT FOR NORDAM**

After consideration of the Nordam submittals of November 29, 1989 and January 10, 1990, the Department finds the following requirements to be appropriate alternate control for Nordam.

#### **DEFINITIONS**

- A. COATING** is a material protective or decorative which covers a surface with a film which may alter the surface characteristics and from which Volatile Organic Solvents can be emitted during the application and/or curing process.
- B. ADHESIVE BONDING PRIMER** is a coating applied in a very thin film that provides corrosion protection and prepares surfaces of aerospace components for adhesive bonding.
- C. PRIMER** is a surface coating applied for the purposes of adhesion of subsequent coatings.
- D. PHOSPHATE ESTER RESISTANT COATING** is a coating which is resistant to phosphate ester-based hydraulic oil.
- E. SPECIALTY COATINGS** are coatings having specific, highly functional uses that do not belong to other categories. They include reflective coatings, infrared absorbent coatings, EMI shield coatings, electric or radiation effect and other low observable coatings, fire retardant coatings, impact resistant coatings, temperature sensitive coatings, anti-chafe coatings, and rain erosion coatings.
- F. TOPCOAT** is a coating applied for purposes of appearance, identification or protection. Coatings which are sandwiched between a primer and a topcoat are considered to be topcoats. A coating which is not formulated as a primer, and which is applied directly to a part as both an initial and final coating is considered as a topcoat.
- G. VOLATILE ORGANIC SOLVENTS (VOS)** are any organic compounds which participate in atmospheric photochemical reactions; that is, any organic compound other than those which the EPA Administrator designates as having negligible

photochemical reactivity. VOS may be measured by the VOC reference method, an equivalent method, an alternate method or by procedures specified under 40 CFR Part 60.

#### STANDARD

The maximum amount (pounds) of VOS per gallon of coating (less water and exempt compounds) that Nordan may discharge to the atmosphere while coating parts, is as follows:

COATING	JAN 1991	JAN 1993
Primers	3.0	
Polyurethane topcoats	3.5	
Epoxy topcoats	4.0	3.5
Adhesive Bond Primer	6.6	
Specialty Coatings, Heat Insulation	4.8	

#### CLEAN UP SOLVENTS

Solvent containing materials used for the cleanup of coating equipment shall be considered when determining compliance with the emissions limits, unless:

- (1) The solvent containing materials are maintained in a closed container when not in use;
- (2) Closed containers are used for the disposal of cloth or paper or other materials used for surface preparation and cleanup;
- (3) The application equipment is disassembled and cleaned in a solvent vat and the vat is closed when not in use; or,
- (4) Solvent containing materials sprayed through the application equipment are collected and placed in a closed container.

#### ALTERNATE STANDARD

In lieu of complying with the individual coating limits set forth in the standard, Nordan may comply through the use of

add-on control equipment. The use of add-on control equipment will be contingent upon the equipment chosen demonstrating that it is at a minimum equivalent to the level of control achieved by the use coatings which meet the standard of 3.5 pounds VOS per gallon (less water and exempt solvents) and meet an overall control efficiency of at least 85%. Companies may use individual coating formulations, which when aggregated, do not exceed 55 gallons per year per facility.

New coatings, are required to meet the permitting requirements of the State. New coatings used in quantities less than 55 gallons per coating per facility per year are exempt from the ARACT plan requirements. New coatings which meet at least a 3.5 pound per gallon VOS limit or have control equipment which is equivalent to at least a 3.5 pound VOS per gallon (less water and exempt solvents) and meet an overall control efficiency of at least 85 percent control are not required to be reported as a part of the ARACT Plan for the facility.

#### **EXEMPTIONS**

1. Coatings applied by swabs or hand held brushes on subassembly and assembly operations are exempt.
2. Coatings applied by aerosol spray cans in subassembly and assembly operations are exempt.

#### **REPORTING AND RECORD-KEEPING**

(A) The owner/operator shall maintain the following:

- (1) A material data sheet which documents the volatile organic solvent content, composition, solids content, solvent density and other relevant information detailing the operational parameters of the coating process sufficient to determine CONTINUOUS compliance with the applicable control limits. Information as to the amounts of each type coating used and the amounts of solvents used for dilution in each coating type shall be maintained for each coating operation. Daily usage records will be kept for all coatings used that do not comply with the applicable control limits specified above;
- (2) Records shall be maintained of any testing conducted at an affected facility in accordance with the provisions specified in 3.7.5-4(h)(6); and,

- (3) Records required by Sections (1) and (2) shall be maintained for at least two years.
- (4) Nordan will maintain records adequate to demonstrate compliance with 3.7.5-4(h)(1)(A) and 3.7.5-4(h)(1)(C)(ii).

**TESTING AND MONITORING**

- (A) Nordan shall, upon a determination by the Air Quality Service that testing is required to establish emissions from any particular source or sources, conduct such tests at his own expense. Test methods may include 1-4, 18, 24, 24A, 25A, 25B found in Appendix A of 40 CFR Part 60, including the procedures found at 40 CFR 60.444.
- (B) Monitoring shall be required of Nordan if it chooses add-on control equipment as the method for compliance. Such monitoring shall include:
  - (1) Installation and maintenance of monitors to accurately measure and record operational parameters of all required control devices to ensure the proper functioning of those devices in accordance with design specifications, including;
    - (a) the exhaust temperature of direct flame incinerators and/or gas temperature immediately upstream and downstream of any catalyst bed,
    - (b) the total amount of volatile organic substances recovered by carbon adsorption or other solvent recovery system during a calendar month, and,
    - (c) the dates and reasons for any maintenance and repair of the required control devices and the estimated quantity and duration of volatile organic substance emissions during such activities,
  - (2) Maintenance of records of any testing conducted at an affected facility in accordance with the provisions specified in Subsection (A) above; and,
  - (3) Maintenance of all records at the affected facility for at least two years and make such records available to representatives of the State or local air pollution control agencies upon request.

MCDONNELL DOUGLAS  
TULSA, OKLAHOMA

DETERMINATION OF ALTERNATE REASONABLY  
AVAILABLE CONTROL TECHNOLOGY (ARACT)  
FINAL APPROVAL

In accordance with the terms and provisions of Oklahoma Air Pollution Control Regulation 3.7.5-4(h), and upon recommendation of the State Air Quality Council, Alternate RACT For McDonnell Douglas, as set forth in the attached Staff Recommendation Concerning The Application of McDonnell Douglas, Tulsa Oklahoma for an Alternate Aerospace Reasonably Available Control Technology Determination Limit, is hereby APPROVED. Compliance with the emission limits set forth therein must be achieved no later than January 1, 1991 except as specified under the Standards Section in this ARACT document.

Done this 21 Day of Feb, 1990.

John Drake Chief, Air Quality Service

Mark Cole Deputy Commissioner  
for Environmental Health  
Services

James K. Lawrence Commissioner of Health

February 13, 1990

**STAFF RECOMMENDATION CONCERNING THE APPLICATION OF  
MC DONNELL DOUGLAS, TULSA  
FOR AN ALTERNATIVE AEROSPACE COATING, REASONABLY AVAILABLE  
CONTROL TECHNOLOGY DETERMINATION LIMIT UNDER REGULATION  
3.7.5-4(h).**

**I BACKGROUND**

1. McDonnell Douglas has had operations in the Tulsa area for over forty years. The Tulsa plant is a manufacturing arm of the corporation. The plant is located in Air Force Plant Number 3. This space is co-habitated with Rockwell Tulsa. The activities of this facility consist of the manufacturing of aircraft and missile parts and components for both commercial and military use. The company works on a contract basis, with the contracts being acquired through competitive bids. As a part of the operation, the plant is involved in the coating of various subassemblies. This work is carried on throughout the facility.
2. The company operates the Tulsa plant on a three shift per day, seven day per week, fifty-one week per year schedule. There are, however, certain operations which vary from this schedule. The various sources at the plants operate on an intermittent schedule. That is, they may only operate a partial shift each day. The sources do not run at capacity. The plant builds metallic and non-metallic structures for its various customers. McDonnell Douglas also contracts with foreign aircraft manufacturers. The plant is involved in the production of parts and subassemblies, the majority of the current business is for the military.
3. During the summer of 1987, the Air Quality Service met with the various industries located in Tulsa County which coat metal products and parts. These meetings were held to inform the industry of the Federal requirement that this class of sources be regulated under the VOS control plan of the State. It was decided, as a result of these meetings, that the State would proceed with two regulations. One would be for the metal products and parts segment of the industry. This was accomplished and proposed at the September. 6, 1988 Air Quality Council Meeting. During the ensuing year various meetings were held, with many different versions of the regulatory strategies proposed. The Air Quality Service, along with the Air Quality Council and the EPA, agreed that the best means of regulating the aerospace industry was a source-



specific approach. This approach was proposed at the October 3, 1989 meeting, and the industry was instructed to develop a source-specific Alternate RACT approach for their individual operations. The plants complied with this request, and it is the basis for the Alternate RACT document for McDonnell Douglas, Tulsa.

4. McDonnell Douglas, Tulsa, is comprised of several sources. The sources which will be considered here are those sources which are in existence today, and which coat various products. Of the 23 point sources listed in the 1988 emissions inventory for the facility, 11 sources would be applicable under Alternate RACT. Of these 23, only 8 would be applicable under the CTG. Some of these would be applicable on a partial basis only. One of these sources, the Maintenance Paint Booth, will be controlled by the CTG. The listing below is taken from McDonnell Douglas's inventory submittal and further breaks down the coating sources.

SOURCE	DESCRIPTION	TPY VOS
1.	East Booth Building 62	10.11
2.	West Booth Building 62	6.32
3.	Conveyorized Booth Building 62	8.85
4.	CFT Booth Building 1	1.08
5.	AV8 Booth Building 1	0.42
6.	DC-8 Booth Building 1	1.00
7.	Booth Number 1 Conveyorized Line	0.56 **
8.	Booth Number 2 Conveyorized Line	0.56 **
9.	Booth Number 3 Conveyorized line	0.56 **
10.	Chem-Mill Maskant Booth	26.06
11.	Maintenance Paint Booth	0.005 *
12.	DC-10 Lavatory Booth	0.003 **
13.	Plastics and Fiberglass Booth	0.01
14.	Silk Screen Booth	0.01
15.	Non-Point Source Paint Usage	2.51

- \* Subject to the provisions of 3.7.5-4(g).
- \*\* Booth out of service.

The other buildings which Mc Donnell Douglas currently inhabits do not have sources which are covered by the provisions of 3.7.5-4(g) or (h).

## II SOURCE BY SOURCE ANALYSIS

The State has developed an approach under the ARACT Regulation which allows the aerospace companies to develop a program which represents, in the view of the company and the State, the best control program available based on real reductions and reasonable costs. McDonnell Douglas has proposed such a plan, and it has been reviewed by the State and EPA. The plan calls for reductions across the plant. It is applicable to metal, non-metal coating as well as the exterior of aircraft. The company has submitted figures which predict the cost for conversion to compliant coatings, as outlined in their plan is approximately \$10,000.00 per ton of VOS removed. The staff has determined that this is a reasonable plan for the control of the facility.

The analysis which is presented here is based upon the materials which were submitted by the company. This is an abbreviated summary, further details are contained in the submittals referenced in earlier sections of this document.

1. East Booth in Enclosure, Building 62. This booth does general coating work, the parts coated here are primarily metallic structures. There are some occasions when non-metallic structures would be coated here. The majority of the work done in this booth would be covered by the CTG. Under the ARACT proposal, the coatings used in this booth would be of the low VOS type.

The costs of add-on controls for this booth are very high and the use of compliant coatings will affect significant reductions in the emissions from this source. This booth is not being considered for consolidation with other booths due to the workload, and the reductions projected.

2. West Booth in Enclosure, Building 62. This is a sister booth to the East Booth; it also does general coating work. These booths are designed to handle large parts. The coatings used in them are varied in the amounts used and the types of coatings applied.

This booth will comply with the use of low VOS coatings. The costs for control are the same as for the East Booth.

3. **Conveyorized Booth, Building 62.** Painting done in this booth is on small parts of a generalized nature. The booth is served by a conveyor system. This system picks up parts from a central area in the plant and then passes through the paint booth. As in the booths above the coatings used in this booth are general in scope. They would include primers and various topcoats. The control of this booth will rely on the use of low VOS coatings.

The cost of add-on control is considered to be prohibitive, the company projects extensive reductions in the emissions from this source by the use of compliant coatings. Due to the conveyorized line in this booth consolidation of the operations of this booth have not been suggested.

4. **CFT Booth, Building 1.** This booth is responsible for the coating of conformal fuel tanks. This is again a specialized paint booth, designed to accommodate the CFT fuel tank. The tank is a very large part, which is of a odd shape. This booth used primarily primers and topcoats. The booth is used for the singular purpose of coating these fuel tanks, the work load is such that this booth cannot be combined with others.

Mc Donnell Douglas has proposed the use of low VOS coating as the means of compliance for this booth. The cost for add-on control for this area is very high. The company has shown decreases in the emissions from this booth.

5. **AV-8 Booth, Building 1.** This booth is similar to the CFT booth, being responsible for the coating of Pylons. These are again large objects which require a booth which will accommodate their size. The coatings used here are topcoats and primers. This booth is used only for the coating of these parts, and is not a large source. The company proposes to control the emissions from this source with the use of compliant coatings.

The source is not a candidate for consolidation due to the size of the parts coated here. Costs of controls other than compliant coatings are considered to be prohibitive.

6. **DC-8 Booth, Building 1.** The operations carried out at this paint booth closely mirror those of the previous two. The DC-8 paint booth is used to coat parts which are large and of an odd shape. The coatings used in this booth are primarily primers and topcoats. This is a low volume booth, with low emissions, the company proposes the use of compliant coatings as its compliance strategy. Emissions for this booth will be less than

half of the current level.

The consolidation of this booth with others is not possible due to the size of the parts coated and workload scheduling. The costs for add-on control is considered to be restrictive.

7. Booth Number 1, Conveyorized Line. Building 1. This booth and the next two have been placed in "mothballs". The company has agreed that the future use of these booths would fall under the permitting authority of the State. These booths when in use, were used to do general coating of miscellaneous parts of medium size. The operations done in these booths have been transferred to other booths in the plant. This consolidation is a result of the action of the company to comply with the emissions reductions in their ARACT plan.
8. Booth Number 2, Conveyorized Line. Building 1. See above.
9. Booth Number 3, Conveyorized Line. Building 1. See above.
10. Chem-Mill Maskant Booth, Building 1. The chem-mill maskant booth applies maskants and to a lesser degree dry film lubricants. Due to the types of coating done in this booth, and the problems associated with the process the only coatings used in this area are those listed above. This is the single largest coating source in the plant, it accounted for 26 tons of emissions in 1989.

The company has proposed the use of low VOS coatings as the means of control of this system under the ARACT. The costs of controlling this system are among the lowest for the plant, however, the company has chosen to use a maskant which will achieve compliance through low VOC technology. The final emissions from this source have been drastically reduced and are considered to be well below the levels the CTG would achieve.

11. Maintenance Booth, Building 1. This source is covered by the provisions of Regulation 3.7.5-4(g). This shop is responsible for the coating of a wide variety of plant equipment. The coating operations performed here use an assortment of coatings, which would include topcoats and primers. This booth is not being considered as a candidate for inclusion with any other booths, due to the activities of the shop and its location. The costs for add-on control far exceed the costs for the use of compliant coatings in this area, therefore, Mc Donnell Douglas would propose the use of

compliant coatings as the means of control.

12. DC-10 Lavatory Booth, Building 1. This booth has been placed in storage, the company has agreed that the future use of this system will be based on obtaining a permit through the State's system. This booth was used in the manufacture of lavatories for commercial airliners. The emissions from this source were not subject to the CTG. The work done in this booth has been completed, or shifted to other booths in the plant.
13. Plastics and Fiberglass Booth, Building 1. This booth is, as the name implies, involved in the coating of plastics and fiberglass, therefore, the coating done in this booth would not be applicable to the CTG. The coatings used in this area are topcoats and primers, the company has proposed the use of compliant versions of these coatings in its Alternate RACT.

The costs of controlling the emissions from this booth are very high, due primarily to the level of emissions, which were 0.01 TPY in 1989. Consolidation of this booth with others is not practical due to the plant layout.

14. Silk Screen Booth, Building 1. This booth is a table top booth involved in the application of patterned coatings to various substrates. This booth had reported emissions of 0.01 tons in 1989. The company has committed to the use of compliant coatings where possible. This booth is considered an active booth. The workload for this source is light and is reflected in its emissions. No cost data for this source have been developed, however, it would be on the extreme due to the emission levels.
15. Other Non-Point Usage. This activity accounted for approximately 2.5 TPY during 1989. This activity includes such things as touch-ups, hole daubing and repairs to damaged finishes. The company has projected that this activity will produce emissions in 1991 that are half those reported in 1989. Compliant coatings are scheduled to be the means of complying under the company's plan.

Cost analysis have not been attempted for this source due to the variability of the need and frequency of application. The activity cannot be done in paint booths and cannot be consolidated.

### III FINDINGS

1. Tulsa County is in an area which has been issued a SIP call by EPA to correct certain deficiencies in the

State's plan for attaining and maintaining the ozone standard.

2. The Air Quality Council has been authorized to develop and recommend regulations for the improvement of air quality. In this activity, they are to consider all facets of the regulations which are being developed. These duties include a responsibility to determine if the regulation under consideration is cost-effective and in the best interest of the State.
3. McDonnell Douglas, Tulsa, is located in an area designated as not attaining the standard for the pollutant ozone.
4. On December 5, 1989, the Air Quality Council approved, for recommendation to the Board of Health, revocation of the existing Section 3.7.5-4(h) of Regulation 3.7, concerning aerospace in Tulsa. A new Section 3.7.5-4(h) was approved which would allow ARACT for the affected industries. This Regulation was approved by the Board of Health on February 8, 1990 and approved by the Governor as an emergency on February 12, 1990. The facility must be in compliance with the limits by January 1, of the applicable year as listed in the Standards Section, i.e., 1991 and 1993.
5. McDonnell Douglas is subject to the provisions of Regulation 3.7.5-4(h) which contemplates either compliance with the 3.5 pounds per gallon requirements of the CTG or the submittal of a source-specific compliance plan.
6. The plan contemplated by Regulation 3.7.5-4(h) was submitted by McDonnell Douglas and was reviewed by the staff of the Air Quality Service. The results of that review are contained herein.
7. The staff finds that McDonnell Douglas has complied with all of the provisions of 3.7.5-4(h) in the submittal of their plan and that ARACT is not only appropriate but is fully justified by McDonnell Douglas in their Alternate RACT Determination consisting of the following documents:
  - (a) McDonnell Douglas October 30, 1989 submittal entitled McDonnell Douglas Tulsa Source Specific RACT Determination.
  - (b) Supplement of November 20, 1989, which outlines the responses to the written questions posed to McDonnell Douglas by the staffs of the Air Quality Service, Tulsa City-County Health Department and EPA.

- (c) Supplement of January 5, 1990, which outlines the Company's response to the alternate reporting requirements of Regulation 3.7.5-4(h).

#### IV RECOMMENDATIONS

The Staff Recommendations for McDonnell Douglas are:

1. That the staff proposal be recommended by the Council to the Department as the Alternate RACT McDonnell Douglas Tulsa facilities.
2. That the Alternate RACT for McDonnell Douglas as presented by the staff be approved by the Department.
3. That the documents presented by McDonnell Douglas as their Alternate RACT Determination on October 30, 1989 be considered as the basis for the limits set for its facilities.
4. That the Alternate RACT determination be forwarded to EPA as a SIP revision.
5. The staff recommendation for Alternate RACT is set forth below. It applies only to the McDonnell Douglas Tulsa facilities in existence on the date of the complete plan submittal.

\* The staff recommendations were approved by the Air Quality Council with minor modifications. The ARACT as set forth in Section V contains changes, as heard at Public Hearing February 13, 1990, and as recommended by the Staff and Council.

#### V ALTERNATE RACT FOR MCDONNELL DOUGLAS TULSA.

After consideration of the McDonnell Douglas submittals of October 30, and November 20, 1989 and January 5, 1990, the Department finds the following requirements to be appropriate alternate control for McDonnell Douglas, Tulsa.

#### DEFINITIONS

- A. AIRCRAFT is any machine designed to travel through the earth's atmosphere. This group includes but is not limited to: airplanes, balloons, dirigibles, drones, helicopters, missiles, and rockets.
- B. AIRCRAFT EXTERIOR is the aircraft surface which is exposed to ambient environmental conditions on the

earth's surface or in flight.

- C. **ADHESIVE BONDING PRIMER** is a coating applied in a very thin film that provides corrosion protection and prepares surfaces for adhesive bonding.
- D. **COATING** is a material decorative or protective which covers a surface with a film which may alter the surface characteristics and from which volatile organic solvents can be emitted during the application and/or curing process.
- E. **FLIGHT-TEST COATING** is a coating other than a standard production coating which is applied to an aircraft prior to flight testing to protect the aircraft from corrosion and to provide required markings during flight test evaluation.
- F. **FUEL-TANK COATING** is the coating applied to the interior of a fuel tank of an aircraft to prevent corrosion.
- G. **CHEMICAL MILLING MASKANT** is a temporary production coating applied directly to an aerospace metal part to protect surface areas from any damage (including mechanical and environmental) during manufacturing operations such as chemical milling, anodizing, plating, etching, aging, bonding or riveting.
- H. **PRIMER** is a surface coating applied for the purposes of adhesion of subsequent coatings.
- I. **PHOSPHATE ESTER RESISTANT COATING** is a coating which is resistant to phosphate ester-based hydraulic oil.
- J. **SOLID FILM LUBRICANT** is a coating consisting of a binder system containing as its chief material one or more of the following: molybdenum disulfide, graphite, polytetrafluoroethylene, lauric acid, cetyl alcohol, waxes or other solids that act as a dry lubricant between faying surfaces.
- K. **SPACE-VEHICLE** is a vehicle designed to travel and function beyond the earth's atmosphere.
- L. **SPACE-VEHICLE COATINGS** are coatings applied to space-vehicles.
- M. **SPECIALTY COATINGS** are coatings having specific, highly functional uses. They include reflective coatings, infrared absorbent coatings, EMI shield coatings, electric or radiation effect and other low observable coatings, fire retardant coatings, impact resistant coatings, temperature sensitive coatings, and rain erosion coatings.



- N. **TEMPORARY PROTECTIVE COATING** is a coating applied to an aerospace component to protect it from mechanical damage during handling, transportation or assembly.
- O. **TOPCOAT** is a coating applied for purposes of appearance, identification or protection. Coatings which are sandwiched between a primer and a topcoat are considered to be topcoats. A coating which is not formulated as a primer, and which is applied directly to a part as both an initial and final coating is considered as a topcoat. Pigmented topcoats contain materials to give the coating a final color. Clear topcoats contain no pigments.
- P. **VOLATILE ORGANIC SOLVENTS (VOS)** are any organic compounds which participate in atmospheric photochemical reactions; that is, any organic compound other than those which the EPA Administrator designates as having negligible photochemical reactivity. VOS may be measured by the VOC reference method, an equivalent method, an alternate method or by procedures specified under 40 CFR Part 60.

**STANDARD**

The maximum amount (pounds) of VOS per gallon of coating (minus water and exempt solvents) as discharged to the atmosphere while coating parts, is as follows:

COATING	JAN 1991	JAN 1993
Primers	3.0	
Phosphate Ester Resistant Primer	3.0	
<b>Topcoats</b>		
All except DPM 110	3.5	
DPM 110	5.8	3.5
Adhesive Bond Primer	6.8	
Flight Test Coatings	7.0	
Fuel Tank Coatings	6.1	
Chem-Mill Maskants	8.4	3.5
Solid Film Lubricants	7.3	
Space-Vehicle Coatings	8.3	

Specialty Coatings	6.8	
Temporary Protective Coatings	2.5	
Lacquer	6.7	3.5
Clear Coating	4.3	3.5

#### **CLEAN UP SOLVENTS**

Solvent containing materials used for the cleanup of coating equipment shall be considered when determining compliance with the emissions limits, unless:

- (1) The solvent containing materials are maintained in a closed container when not in use;
- (2) Closed containers are used for the disposal of cloth or paper or other materials used for surface preparation and cleanup;
- (3) The application equipment is disassembled and cleaned in a solvent vat and the vat is closed when not in use; or,
- (4) Solvent containing materials sprayed through the application equipment are collected and placed in a closed container.

#### **ALTERNATE STANDARD**

In lieu of complying with the individual coating limits set forth in the standard, Mc Donnell Douglas, Tulsa, may comply through the use of add-on control equipment. The use of add-on control equipment will be contingent upon the equipment chosen demonstrating that it is at a minimum equivalent to the level of control achieved by the use coatings which meet standard of 3.5 pounds VOS per gallon (less water and exempt solvents) and meet an overall control efficiency of at least 85%. Companies may use individual coating formulations, which when aggregated, do not exceed 55 gallons per year per facility.

New coatings, are required to meet the permitting requirements of the State. New coatings used in quantities less than 55 gallons per coating per facility per year are exempt from the ARACT plan requirements. New coatings which meet at least a 3.5 pound per gallon VOS limit or have control equipment which is equivalent to at least a 3.5 pound VOS per gallon (less water and exempt solvents) and meet an overall control efficiency of at least 85 percent control are

not required to be reported as a part of the ARACT Plan for the facility.

#### EXEMPTIONS

1. Coatings applied by swabs on subassembly and assembly operations are exempt.
2. Coatings applied by aerosol spray cans in subassembly and assembly operations are exempt.

#### REPORTING AND RECORD-KEEPING

McDonnell Douglas has chosen to maintain its records in the following manner as allowed by 3.7.5-4(h)(5)(B). McDonnell Douglas Tulsa shall maintain the following:

- (1) A material data sheet which documents the volatile organic solvent content, composition, solids content, solvent density, and other relevant information detailing the operational parameters of the coating process sufficient to determine CONTINUOUS compliance with the applicable control limits;
- (2) Records of coating and solvent distributed to coating departments. At McDonnell Douglas, Tulsa, coatings and solvent materials are distributed by Paint Stores. When materials are issued, the type and quantity issued and the receiving department are recorded. These daily records are stored on computer. Each month a report detailing daily coating and solvent usage is automatically generated. This report lists each material, the coating department, the date issued and the quantity;
- (3) Records shall be maintained of any testing conducted at an affected facility in accordance with the provisions specified in 3.7.5-4(h)(6);
- (4) Records shall be maintained to adequately demonstrate compliance with the provisions of 3.7.5-4(h)(1)(A) and 3.7.5-4(h)(1)(C)(ii);
- (5) Records required by Sections (1) through (4) of this order shall be maintained for at least two years and shall be made available upon written request by representatives of the Air Quality Service, the U.S. Environmental Protection Agency or the Tulsa City-County Health Department.

#### TESTING AND MONITORING

- (A) McDonnell Douglas shall, upon a determination by the Air Quality Service that testing is required to establish

emissions from any particular source or sources, conduct such tests at their expense. Test methods may include 1-4, 18, 24, 24A, 25A, 25B found in Appendix A of 40 CFR Part 60, including the procedures found at 40 CFR 60.444.

- (B) Monitoring shall be required of McDonnell Douglas if it chooses add-on control equipment as the method for compliance. Such monitoring shall include:
- (1) Installation and maintenance of monitors to accurately measure and record operational parameters of all required control devices to ensure the proper functioning of those devices in accordance with design specifications, including:
    - (a) the exhaust temperature of direct flame incinerators and/or gas temperature immediately upstream and downstream of any catalyst bed,
    - (b) the total amount of volatile organic substances recovered by carbon adsorption or other solvent recovery system during a calendar month, and,
    - (c) the dates and reasons for any maintenance and repair of the required control devices and the estimated quantity and duration of volatile organic substance emissions during such activities,
  - (2) Maintenance of records of any testing conducted at an affected facility in accordance with the provisions specified in Subsection (A) above; and,
  - (3) Maintenance of all records at the affected facility for at least two years and make such records available to representatives of the State or local air pollution control agencies upon request.

6560.50

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52  
[FR 37000]

APPROVAL AND PROMULGATION OF AIR QUALITY IMPLEMENTATION PLANS;  
OKLAHOMA; TULSA COUNTY OZONE PLAN

AGENCY: Environmental Protection Agency (EPA).

ACTION: Direct Final Rulemaking.

SUMMARY: This notice approves a revision to the Oklahoma ozone State Implementation Plan (SIP) for Tulsa County. This revision; 1) establishes a regulation allowing the State to issue an alternate reasonably available control technology (RACT) determination for the aerospace industries located in Tulsa County, Oklahoma and 2) approves four source specific RACT determinations for Rockwell International, McDonnell Douglas-Tulsa, American Airlines, and Nordam. This SIP revision was submitted by the Governor on March 9, 1990, in response to EPA's SIP call of May 26, 1988. The intended effect of this action is to establish legally enforceable Volatile Organic Compound (VOC) emission limits for new and existing facilities in Tulsa County.

These limits are being determined by EPA to represent RACT for each of the Tulsa aerospace facilities. These alternate RACT determinations are approvable because the four industries have demonstrated that it is not cost effective to control their VOC emissions to the presumptive norm set forth in EPA's Control Technique Guideline document (EPA 450/2-78-015).

EFFECTIVE DATE: This action will become effective on (insert 60 days from date of publication) unless notice is received by (insert 30 days from date of publication) that someone wishes to submit adverse or critical comments.

If the effective date is delayed, timely notice will be published in the Federal Register.

VR

**ADDRESSES:** Written comments on this action should be addressed to Mr. Thomas H. Diggs, Chief, Planning Section of the EPA Region 6, Air Programs Branch (address below). Copies of the documents relevant to this action are available for public inspection during normal business hours at the following locations:

U.S. Environmental Protection Agency  
Region 6, Air Programs Branch (6T-AP)  
1445 Ross Avenue  
Dallas, Texas 75202

Public Information Reference Unit  
Environmental Protection Agency  
401 M Street, S.W  
Washington, D.C. 20460

Oklahoma State Department of Health  
Air Quality Service  
1000 Northeast 10th Street  
Oklahoma City, Oklahoma 73152

**FOR FURTHER INFORMATION CONTACT:** Gregg Guthrie, telephone (214) 655-7214 or (FTS) 255-7214.

**SUPPLEMENTARY INFORMATION:**

**Background**

Part D of the Clean Air Act requires ozone nonattainment plans to include regulations providing for VOC emission reductions from existing sources through the adoption of RACT. For 1979 plans that demonstrated attainment of the ozone National Ambient Air Quality Standard (NAAQS) by December 31, 1982, RACT regulations are required for major sources (i.e., those emitting greater than 100 tons per year) of VOC that are covered by a Control Technique Guideline (CTG) Document. The 1979 ozone SIP

for Tulsa County was conditionally approved by EPA on February 13, 1980, at 45 FR 9733. After additional submittals by the State, EPA removed the conditions on November 11, 1980, at 45 FR 79051.

On February 24, 1984, EPA notified the Governor of Oklahoma that Tulsa County had failed to attain the ozone NAAQS by December 31, 1982. For the areas that failed to meet the December 31, 1982, deadline, EPA also required plan revisions that establish RACT for both major and minor sources of VOC that are covered by a CTG Document.

On October 23, 1987, EPA Region 6 notified the Oklahoma State Department of Health (OSDH), Air Quality Service (AQS) that their existing surface coating regulation for miscellaneous metal parts and products no longer met RACT since it did not control major and minor sources to the level recommended by EPA. The State was directed to the EPA CTG document "Surface Coating of Miscellaneous Metal Parts and Products" (EPA-450/2-78-015) for guidance on how to develop an acceptable regulation.

On May 26, 1988, EPA further notified the Governor of Oklahoma that the Tulsa ozone SIP had failed to attain the NAAQS (based on 1985-1987 data) by December 31, 1987, and therefore, required further revision. In response to this notification, one item the State was requested to amend was its miscellaneous metal parts and products surface coating regulation. However, since the existing regulation applied statewide the OSDH chose to write a new regulation that is specific to Tulsa County.

During the rulemaking process, the OSDH considered several proposed regulations for the miscellaneous metal parts and products coating operations in Tulsa. After analysis of comments and discussions with all affected parties, including the Tulsa aerospace industries and EPA, the State chose to determine RACT on an individual basis for each of the four aerospace companies in Tulsa County.

EPA defined RACT in a September 17, 1979, Federal Register notice (44 FR 53762) as:

"The lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."

Through the publication of CTG documents, EPA has identified pollution control levels that EPA presumes to constitute RACT for various categories of sources. Where the State finds the presumptive norm applicable to an individual source or group of sources, the State typically adopts requirements consistent with the presumptive norm. However, States may develop case-by-case RACT determinations. EPA will approve these RACT determinations as long as the State demonstrates they will satisfy the Clean Air Act's RACT requirements based on adequate documentation of the technical and economic circumstances of the particular source being regulated.

EPA Region 6 developed a guidance document titled "Guidance for Developing an Alternate Reasonably Available Control



Technology (RACT) Demonstration for the Tulsa Aerospace Industry." This document was issued for the State and industries to follow in developing documents to justify deviation from the recommended CTG approach.

#### **Tulsa Air Quality and Reasonable Further Progress**

Even though EPA determined that Tulsa County had failed to attain the ozone NAAQS by December 31, 1987, (based on 1985-1987 data) current air quality data (1987-1989) indicate that Tulsa County has attained the NAAQS for ozone. EPA examined the 1987-1989 air quality data and found that they were collected in accordance with all EPA requirements. Monitoring sites have indicated a calculated maximum annual average expected number of exceedances of 0.37. The data collected reveal the area has monitored attainment since EPA requires a 1.0 or lower value for an annual average expected exceedance to demonstrate attainment.

The Reasonable Further Progress (RFP) curve submitted with the Tulsa Post 82 ozone SIP predicted sufficient reductions would be achieved consistently with the implementation of the State regulations and the continuation of the Federal Motor Vehicle Control Program to attain the ozone NAAQS. The curve shows that a decrease of 19.7 percent was to occur in Tulsa County between 1984 and 1986. This was without the reductions from regulating the aerospace industries. The OSDH demonstrated that a 12 percent decrease of VOCs was required to attain the ozone standard. The RFP curve projected an attainment date of December 31, 1986. Since December 31, 1987, no violations of

the ozone NAAQS have occurred in Tulsa County. Therefore, the added VOC reductions from the alternate RACT determinations for the Tulsa aerospace industries will provide continued assurance of maintenance of the ozone NAAQS.

EPA intends to act on the Tulsa Post-82 SIP in the near future. Currently, EPA is expecting to propose approval of both the SIP and a redesignation request for the Tulsa area. Should maintenance of the ozone NAAQS become a problem in the future, the State regulation will require revisitation of the determinations discussed in this notice.

The remainder of this notice discusses the Oklahoma Air Pollution Control Regulation (OAPCR) 3.7.5-4(h) "Control of VOS Emissions from Aerospace Industries Coatings Operations" and its accompanying Oklahoma Commissioner of Health Orders adopted for each of the four Tulsa companies.

#### Definition of Volatile Organic Compound

One EPA requirement for developing an approvable surface coating regulation is properly defining the term Volatile Organic Compound (VOC). Oklahoma's regulation for controlling organic substances that lead to ozone formation is structured somewhat differently than EPA had originally envisioned. The State regulates "Organic Materials" through OAPCR 3.7 "Control of Emissions of Organic Materials." The State's definition of organic materials includes all compounds containing carbon atoms with the exception of carbon monoxides, carbon dioxide, carbonic acid, metallic carbides, metal carbonates and ammonium

carbonates. Organic materials is subdivided into specific categories defined by the terms VOC, organic solvents, petroleum liquid and volatile organic solvent (VOS).

Oklahoma's existing definition of VOC was originally written specifically for the petroleum marketing industry. EPA notified the State that if VOC was to be used in surface coating regulations it would require revising their definition to be consistent with EPA guidance. Oklahoma informed EPA that redefining VOC in the OAPCR 3.7 would require substantial restructuring of the entire OAPCR 3.7. The State chose to define a new term "VOS" to be used in surface coating regulations. The State's definition of VOS is consistent with EPA's definition of VOC. Throughout the remainder of this notice the reader should note that the term VOS is consistent with EPA's definition of VOC.

#### **Oklahoma's Aerospace Regulation**

OAPCR 3.7.5-4(h) is written as a directional tool for those aerospace industries in Tulsa that wish to obtain permission to deviate from the recommended CTG miscellaneous metal parts and products regulation. OAPCR 3.7.5-4(h) reads very similar to the Region 6 guidance document for Tulsa in that it requires sources to go through an extensive review of available options for reducing emissions. Sources are required to investigate the availability and economic and technical feasibility of reformulation, add-on control equipment, facility redesign and improved application techniques. OAPCR 3.7.5-4(h) applies to all

new and existing aerospace facilities in Tulsa County. Those sources with the potential to emit less than ten tons per year are exempt.

Individual coatings may be exempt provided their total volume for the facility does not exceed 55 gallons per year. Additionally, new coatings that are not included in the source specific RACT determination may be exempt on one of two conditions. First the new coating must contain a VOS content less than or equal to 3.5 pounds of VOS per gallon of coating (less water and exempt solvents), or second, the total usage of the new coating does not exceed 55 gallons per year per facility. Those coatings that do not meet either of the above two conditions are required to obtain permits through the State's permitting regulation (OAPCR 1.4). These permits will then be submitted to EPA for approval as source specific SIP revisions.

Compliance with the Orders issued pursuant to OAPCR 3.7.5-4(h) is determined on a coating by coating basis. The Orders require the sources to keep material data sheets for each coating and daily records of coatings issued to each coating operation within the facility. The material data sheets are required to list formulation data such as the VOS content, composition, solids content, and solvent density. These data sheets will be used for normal compliance purposes, however, should EPA or the State determine the need for closer scrutiny, sources will be required to perform the New Source Performance Standard (NSPS) test Method 24 found at 40 CFR Part 60, Appendix A. If an NSPS

Method 24 test is performed, the legally binding compliance determination will be based on the Method 24 test results, not the material data sheets. No averaging of coating limitations is allowed.

No averaging is allowed for those sources wishing to comply through the installation of control equipment. Sources will calculate the maximum VOS content that a coating may contain based on the efficiency of the control device. This calculation will be performed on a solids basis and will represent a reduction of emissions that is equivalent to the emissions that would result from the use of coatings that meet the applicable limit of the source specific Order.

#### **Alternate RACT Analysis**

Each company investigated the options available for reducing emissions from its surface coating operations. Among those were coating reformulation, enhanced application techniques that would improve transfer efficiency, facility redesign and add-on control equipment to reduce VOC emissions.

All four companies investigated the use of low-solvent coating technologies. Among those were high-solids coatings, water-borne coatings, and powder coatings. The companies contacted many of the leading coating manufacturers to determine if such coatings were either currently available or could be expected to become available in the near future.

Those low VOC coatings that were identified to be currently available or soon to be available, mainly primers and topcoats,

are regulated in the source specific Order for each company. Please refer to EPA's technical support document for a copy of each order which contains a precise listing of those coatings.

Each company investigated the use of add-on control equipment in its operations. The companies contacted vendors to determine if such equipment could be suitable for its particular operation.

#### **Cost Effectiveness of Add-on Control Equipment**

Cost estimates for add-on control equipment were prepared using methodology presented in the EPA document "EAB Control Cost Manual", third edition, February 1987, (EPA-450/5-87-001A). Each company developed cost estimates for tons of VOC removed. The aircraft industry in general typically designs its coating booths to accommodate the largest part requiring coating. The larger the booth the greater the airflow through the booth, and therefore the lower the VOC concentration. The actual concentration of VOC in the exhaust stream and the total volume of air to be treated are primary factors in determining cost effectiveness. Typically the industry not only coats parts in the booths, but also uses the booths as a flash off and/or cure area. This intermittent use of the booths leads to low VOC concentrations in the exhaust streams. While EPA strongly believes that these problems can be overcome by measures such as spray booth air recirculation, facility redesign, and product scheduling, the particular application of these measures to the Tulsa facilities is not cost effective. This is due to the low

total VOC emissions from the coating operations from each of the four Tulsa industries. EPA reviewed the information developed by the four companies and, with the exception of McDonnell Douglas' chemical mill maskant operation, EPA agrees that these costs should not be considered cost effective in this situation relative to the cost effectiveness assumed in the CTG for miscellaneous metal parts and products.

#### **Source Specific RACT Determinations**

Oklahoma uses the term Volatile Organic Solvent (VOS) in their surface coating regulation. This term is identical to EPA's definition of VOC.

Individual coating limits have been established for each type of coating in use. The majority of limits have compliance dates of January 1991, although some coating limits are further reduced to lower limits that have a compliance date of January 1993.

In an effort to obtain reductions similar to those that would be obtained through adoption of a regulation as suggested in EPA's CTG document for miscellaneous metal parts and products, the OSDH has regulated the coating of both metal and non-metal parts and products (i.e., plastics and composites). The OSDH regulates all surface coatings used at each particular facility.

#### **Rockwell International**

This section discusses the determination made for Rockwell International - Tulsa (Rockwell). Rockwell operations occupy three contiguous sites in Tulsa County. The company is a

contractor fabricating aerostructures for the commercial and military markets. Rockwell emits roughly 70 TPY of VOCs from its coating operations, which include approximately 20 separate spray booths. No one booth emits greater than 15 TPY and most are below 5 TPY.

Coating limits are set in the Rockwell Order for 22 coating types of which 7 are at or below the 3.5 pounds VOS per gallon of coating (less water and exempt solvents) recommended by the CTG document. Specifically, coating limits for primers are specified at 3.0 pounds of VOS per gallon of coating (less water and exempt solvents) and topcoats are specified at 3.5 pounds of VOS per gallon of coating (less water and exempt solvents) with the exception of those discussed in the following paragraphs.

Rockwell's source specific Order specifies two categories of primers, domestic commercial and foreign commercial. Domestic commercial primers are limited to 3.0 pounds of VOS per gallon of coating (less water and exempt solvents) and foreign commercial primers limited to 5.4 pounds of VOS per gallon of coating (less water and exempt solvents). The company explained that they were actively bidding on aerostructures work for foreign airplane manufacturers in Europe, Canada, and Asia. The manufacturing specifications for aircraft coatings in these countries is based on formulations developed in the late 1940s. Rockwell expressed that for foreign manufacturers coating substitution would require full recertification of the airframe. Rockwell felt that it was necessary to either furnish coatings as specified or be excluded



from the bidding process. EPA neither agrees nor disagrees with this justification, but is raising it to the attention of any interested parties.

Rockwell's source specific alternate RACT also specifies two categories of topcoats, commercial and military, with phase-in reductions occurring two years after initial compliance. For January 1, 1991, pigmented topcoats are limited to 5.2 pounds of VOS per gallon of coating and clear topcoats are limited to 5.7 pounds of VOS per gallon. For January 1, 1993, commercial topcoats, both clear and pigmented, are limited to 3.5 pounds VOS per gallon and military topcoats remain at 1991 levels. The company explained that the commercial aircraft industry is further in the stages of evaluating low VOS coatings than the military, and therefore more willing to allow their use. In addition the company currently has military contracts in place that require the use of the higher VOS content coatings. EPA neither agrees nor disagrees with this justification, but is raising it to the attention of interested parties. EPA staff is in contact with the Department of Defense (DOD) and is discussing the issues associated with military specification modifications to allow the use of low VOC coatings.

#### **McDonnell Douglas-Tulsa**

This section discusses the determination made for McDonnell Douglas - Tulsa (McDonnell Douglas). McDonnell Douglas' operations occupy a portion of Air Force Plant number three in Tulsa County. The company is a contractor fabricating

aerostructures for the commercial and military markets. McDonnell Douglas emits roughly 60 TPY of VOCs from three separate spray booths.

Coating limits are set in the Order for 14 coating types of which 8 are at or below the 3.5 pounds VOS per gallon (less water and exempt compounds) recommended by the CTG document. Specifically, January 1991 coating limits for primers are specified at 3.0 pounds of VOS per gallon (less water and exempt compounds) and topcoats are specified at 3.5 pounds VOS per gallon (less water and exempt compounds), with the exception of the topcoat DPM 110 which is specified at 3.5 pounds of VOS per gallon (less water and exempt compounds) in January 1993.

McDonnell Douglas' largest source of coating emissions is its chemical mill maskant operation. McDonnell Douglas agreed to a phased-in emission limit strategy for this operation. By January 1, 1993, McDonnell Douglas will either 1) reformulate its maskant to meet a 3.5 pounds of VOS per gallon of coating (less water and exempt solvents) limit, or 2) install add-on control equipment to obtain a minimum of 85 percent overall control and sufficient VOS reductions so that emissions are equivalent to what would result from use of a maskant which contains 3.5 pounds of VOS per gallon (less water and exempt solvents). McDonnell Douglas expects their reformulated maskant to contain a 1.0 pound per gallon VOS (less water and exempt solvents) content. Since this coating is still in the developmental stages, the State chose a 3.5 limit rather than a 1.0 limit.

**American Airlines**

This section discusses the determination made for American Airlines' Tulsa facility (American). American's Tulsa facility is the maintenance and repair center for the company's fleet of commercial aircraft. As the company's maintenance facility, it is required to perform recoating and touch up coating of various parts of the aircraft. American emits roughly 60 TPY of VOCs from its coating operations.

The facility operates approximately 10 separate spray booths where parts are removed from the aircraft and recoated. No one booth emits greater than 10 TPY and most are below 5 TPY.

The primary maintenance activities are performed in large hangers. Each hanger has several docks at which aircraft are serviced. This activity is the largest source of coating emissions at the facility (27 TPY) and is attributable to the fugitives from touch up coating of fully assembled aircraft during the maintenance activities.

Coating limits are set forth in the Order for 10 coating types of which 8 are at or below the 3.5 pounds VOS per gallon of coating (less water and exempt solvents) recommended by the CTG document. The remaining two coatings, adhesive bond primer and fuel tank coating, are set at 6.8 and 6.1 pounds of VOS per gallon of coating (less water and exempt solvents), respectively.

**NORDAM**

This section discusses the determination made for Nordam's Lansing Street facility. Nordam operates three separate sites in

Tulsa County. All three facilities are located several miles apart and are operated under separate management. Two of the facilities have potential emissions of less than 10 TPY and are therefore not subject to OAPCR 3.7.5-4(h). The third facility, located on Lansing Street, is operated by a contractor fabricating and repairing aerostructures for the commercial and military markets. The Lansing Street facility emits roughly 10 TPY of VOCs from its coating operations.

Nordam's source specific alternate RACT Order specifies two categories of topcoats, epoxy and polyurethane, with phase-in reductions occurring two years after initial compliance for the epoxy topcoats. For January 1, 1991, epoxy topcoats are limited to 4.0 pounds of VOS per gallon of coating (less water and exempt solvents) and polyurethane topcoats are limited to 3.5 pounds of VOS per gallon of coating (less water and exempt solvents). For January 1, 1993, epoxy topcoats are further limited to 3.5 pounds VOS per gallon of coating (less water and exempt solvents). The company explained that they currently have military contracts in place that require the use of the epoxy topcoats. EPA neither agrees nor disagrees with this justification, but is raising it to the attention of any interested parties.

The remaining regulated surface coatings in use by Nordam are primers, adhesive bond primer and a special heat insulation coating. Limits set forth in Nordam's Order for the above mentioned coatings are 3.0, 6.6 and 4.8 pounds of VOS per gallon of coating (less water and exempt solvents), respectively.

**SUMMARY**

EPA's review of the information submitted by the four companies indicates that, at this time, low VOC coatings for certain applications and processes are not commercially available for Rockwell International, McDonnell Douglas, American Airlines, and Nordam, located in Tulsa County. Furthermore, the cost effectiveness of controls on emissions from certain processes at these facilities are inconsistent with the presumptive norm for cost effectiveness assumed in the CTG for miscellaneous metal parts and products. EPA finds that the requirements in the recommended CTG are not reasonable for certain processes and that the proposed source specific Alternate RACT determinations in the Oklahoma Commissioner of Health Orders should be considered RACT in these cases. EPA, therefore, approves OAPCR 3.7.5-4(h) and the corresponding Oklahoma Commissioner of Health Orders for each of the four facilities.

EPA is publishing this action without prior proposal because the Agency views this as a noncontroversial amendment and anticipates no adverse comments. This action will be effective (insert 60 days from the date of publication) unless, within 30 days of its publication, notice is received that adverse or critical comments will be submitted.

If such notice is received, this action will be withdrawn before the effective date by publishing two subsequent notices. One notice will withdraw the final action and another will begin a new rulemaking by announcing a proposal of the action and

establishing a comment period. If no such comments are received, the public is advised that this action will be effective (insert 60 days from date of publication).

#### Final Action

The EPA is today approving OAPCR 3.7.5-4(h) which allows for source specific RACT determinations as adopted December 5, 1989, by the Oklahoma Air Quality Council and February 8, 1990, by the Oklahoma Board of Health. OAPCR 3.7.5-4(h) was signed as an emergency rule by the Governor of Oklahoma on February 12, 1990, and submitted to EPA as a SIP revision on March 9, 1990.

EPA is also today approving Oklahoma's source specific RACT determination Orders issued by the Oklahoma Commissioner of Health on February 21, 1990, for the Rockwell International, McDonnell Douglas-Tulsa, American Airlines, and Nordan facilities in Tulsa.

Nothing in this action should be construed as permitting or allowing or establishing a precedent for any future request for revision to any SIP. Each request for revision to the SIP shall be considered separately in light of specific technical, economic, and environmental factors and in relation to relevant statutory and regulatory requirements.

Under 5 U.S.C. Section 605(b), I certify that this SIP revision will not have a significant economic impact on a substantial number of small entities. (See 46 FR 8709)

This action has been classified as a Table 3 action by the Regional Administrator under the procedures published in the

Federal Register on January 19, 1989 (54 FR 2214-2225). On January 6, 1989, the Office of Management and Budget (OMB) waived Table 2 and 3 SIP revisions (54 FR 2222) from the requirements of Section 3 of Executive Order 12291 for a period of two years.

Under Section 307(b)(1) of the Act, petitions for judicial review of this action must be filed in the United States Court of Appeals for the appropriate circuit by (60 days from date of publication). This action may not be challenged later in proceedings to enforce its requirements (See 307(b)(2)).

List of Subjects in 40 CFR Part 52:

Air pollution control, Hydrocarbons, Incorporation by reference, Intergovernmental relations, Ozone, Reporting and recordkeeping requirements.

~~AUTHORITY:~~ 42 U.S.C. 7401-7642 <sup>R</sup>

"NOTE: Incorporation by reference of the State Implementation Plan for the State of Oklahoma was approved by the Director of the Federal Register on July 1, 1982."

MAY 9 1990

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Date

*Robert E. Layton Jr.*  
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Robert E. Layton Jr., P.E.  
Regional Administrator

VR

40 CFR Part 52, Subpart LL, is amended as follows:

SUBPART LL - OKLAHOMA

1. The Authority citation for Part 52 continues to read as follows:

AUTHORITY: 42 U.S.C. 7401-7642

2. Section 52.1920 is amended by adding paragraph (c)(36) to read as follows:

\* \* \* \* \*

(c) \* \* \*

(36) On March 9, 1990, the Governor submitted Oklahoma Air Pollution Control Regulation 3.7.5-4(h) "Control of VOS Emissions from Aerospace Industries Coatings Operations". This regulation was adopted by the Oklahoma Air Quality Council on December 5, 1989, and by the Oklahoma Board of Health on February 8, 1990. The regulation became effective when it was signed by the Governor as an emergency rule on February 12, 1990. Also on March 9, 1990, the Governor of Oklahoma submitted four source specific alternate RACT determination Orders issued by the Oklahoma Commissioner of Health for the Rockwell International, McDonnell Douglas-Tulsa, American Airlines and Nordam facilities in Tulsa County.

(i) Incorporation by reference

(A) Oklahoma Air Pollution Control Regulation 3.7.5-4(h) "Control of VOS Emissions from Aerospace Industries Coatings Operations" as adopted by the Oklahoma Air Quality Council on December 5, 1989, and the Oklahoma Board of Health on February 8, 1990, and approved by



the Governor on February 12, 1990.

- (B) Oklahoma Commissioner of Health Order issued and effective February 21, 1990, for Rockwell International, Tulsa approving an Alternate Reasonably Available Control Technology (ARACT).
- (C) Oklahoma Commissioner of Health Order issued and effective February 21, 1990, for McDonnell Douglas-Tulsa approving an Alternate Reasonably Available Control Technology (ARACT).
- (D) Oklahoma Commissioner of Health Order issued and effective February 21, 1990, for American Airlines approving an Alternate Reasonably Available Control Technology (ARACT).
- (E) Oklahoma Commissioner of Health Order issued and effective February 21, 1990, for Nordam's Lansing Street facility approving an Alternate Reasonably Available Control Technology (ARACT).

(ii) Additional material

- (A) Rockwell International Tulsa
  - (1) The document prepared by Rockwell International titled "Rockwell International NAA-Tulsa Alternate RACT Determination" dated October 30, 1989.
  - (2) The document prepared by Rockwell titled "Rockwell International NAA-Tulsa Alternate RACT Determination Supplemental Submittal" dated November 22, 1989.
- (B) McDonnell Douglas
  - (1) The document prepared by McDonnell Douglas-Tulsa

titled "Source Specific RACT Determination" dated October 30, 1989.

(2) The document prepared by McDonnell Douglas-Tulsa titled "ARACT/Follow-up Submission" dated November 20, 1989.

(C) American Airlines

(1) The document prepared by American Airlines titled "American Airlines Tulsa Alternate RACT" dated October 30, 1989.

(2) The document prepared by American Airlines titled "ARACT/Follow-up Submission" dated November 22, 1989.

(D) Nordam

(1) The document prepared by Nordam titled "Source Specific RACT Determination" dated November 29, 1989.

(2) The document prepared by Nordam titled "ARACT/Follow-up Submission" dated January 10, 1990.