E-Enterprise for the Environment
Combined Air Emissions Reporting (CAER)

Research and Development Project :
Quality Assurance/Quality Control Procedures
Phase 1

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QA/QC Project – Purpose and Scope

Purpose = Why

- Reduce the burden associated with the point-source emissions data QA/QC process, to the extent practical, in the context of a <u>common emissions reporting approach.</u>

Scope = How

- Compile a comprehensive table of QA/QC checks related to point source emissions data, that are currently in use by State, Local, Tribal (SLT) and EPA emissions reporting programs.

- Evaluate the extent to which such checks could be automated within an electronic reporting system, and develop recommendations for potential use specifically within the framework of a shared, common emissions reporting platform.

Team Members

- States (WY, NC, GA, SC and VA)

- EPA, Office of Air Quality, Planning and Standards

QA/QC Project – Background

January 2016 – CAER Strategy Workshop event
- Included four state and four EPA program representatives
- Improving QA/QC procedures ranked as high priority for CAER proposed future state
  - How can we establish standardized or uniform QA/QC procedures for emissions reporting?
  - How can we move more QA/QC to the front-end on industry data entry and submittal?
  - How can we incorporate QA/QC routines into a standalone service available to SLTs ?
  - Goals to avoid duplicative QA/QC, address data quality earlier, and improve data.

September 2016 – CAER "Quick Start" event
- Four states (diff. from Jan workshop) and four EPA program representatives
- Improving QA/QC procedures was recommended as high priority research area for CAER
- Priorities similar to Jan. workshop: address more QA/QC upfront; automate where possible; establish shared, uniform set of QA/QC procedures
  - Discussed using shared services or applications to implement the QA/QC routines.
  - Discussed the possible inclusion of automated QA/QC checks and standardized protocols as part of a "common emission form" (CEF)-based workflow under CAER.
  - Suggested initial steps to include research on what QA/QC is currently being used; compile list of common procedures and canvass for other recommendations.

QA/QC Project – Research & Analysis Steps

Starting-point tables of QA/QC procedures compiled from team member states and EPA programs – Automated vs. Manual checks

- One table included what are typically seen as automated, electronic checks as part of existing emission inventory systems
- Other table included checks that are often not typically automated at this point, and referred to sometimes as "manual checks" or "engineering review" checks

State members distributed a national survey to SLT reporting programs

- Asked for any unique additions to the "starting point" tables
- Six questions related to QA/QC procedures and emission reporting systems
- Total of 33 responses from SLT programs

Compilation and summary of survey results

- Additions /edits to starting point tables
- Characterization of QA/QC and reporting systems being used
- Collection of comments on specific aspects of QA/QC

Prepare recommendations for next phase of project

QA/QC Project – Results and Findings

Key Takeaways from Survey

Automation of QA/QC procedures

- Nearly all participants indicated that they believe there is potential value in integrating, or further integrating, automated QA/QC checks into their emissions reporting systems.
- About 30% of respondents indicated that more than half of their QA/QC procedures are automated.

### Completeness of 'starting point' list of common QA/QC procedures and checks

- About 30% of respondents added additional checks to our starting point tables, while others indicated that the tables covered the checks in their system.

Characteristics of reporting systems (indicates ability to accommodate different types of QA/QC checks)
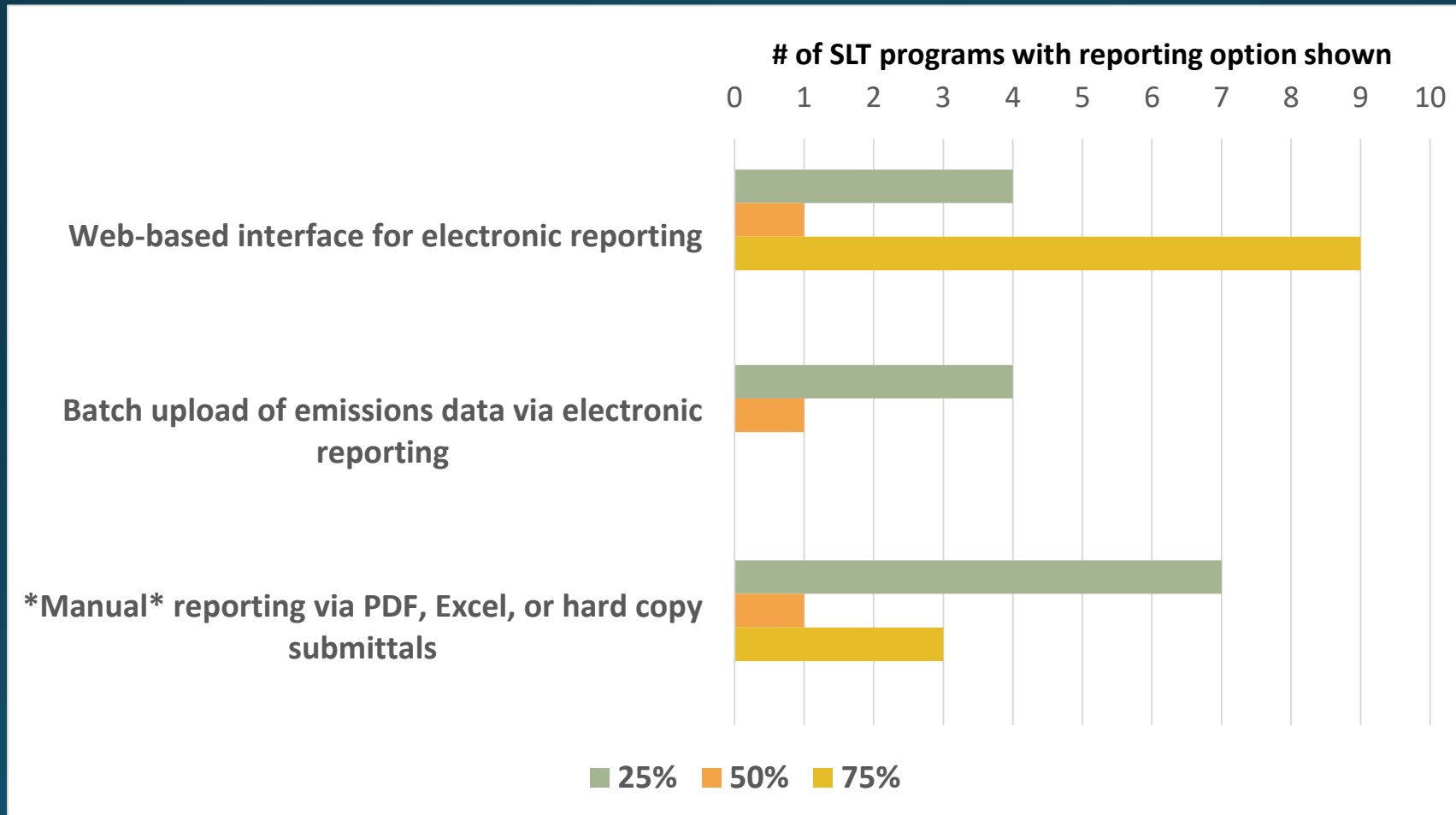
- Almost 60% of respondents indicated that at least 75% of their reporting facilities used a web-based interface for reporting.
- Approximately 30% indicated that at least 75% of their reporting facilities used a 'manual' reporting system via PDF, Excel, or hard-copy submittals.
- 85% of respondents indicated that their emissions inventory and permitting systems are not integrated.

### Following slides show detailed breakdowns by individual questions

Survey Question: Indicate what percentage of your facilities use the following reporting methods

Percentage of programs to which facilities report by the following method *exclusively*
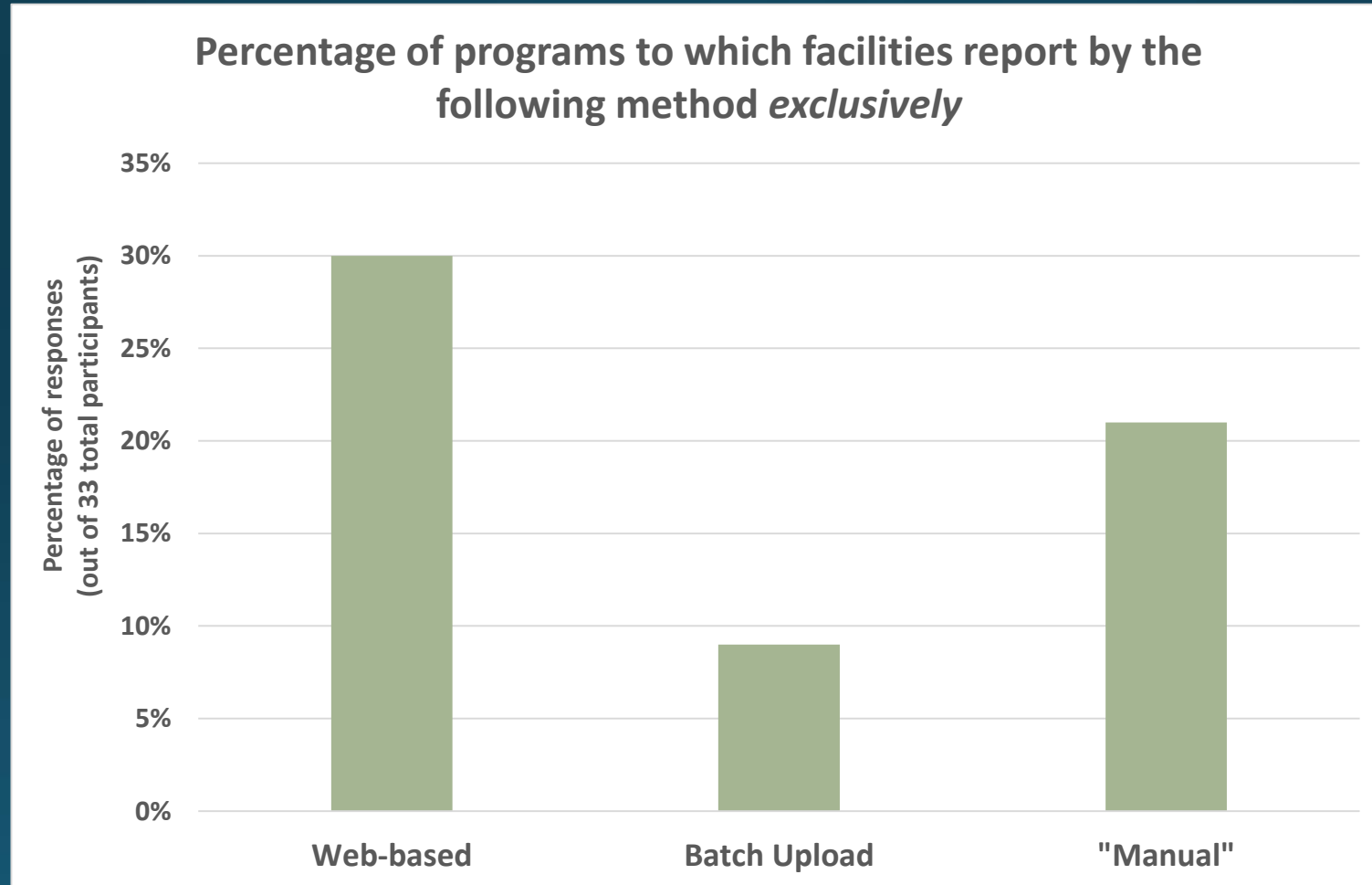
Survey Question: Indicate what percentage of your facilities use the following reporting methods (for programs where more than one type of reporting is used):

# of SLT programs with reporting option shown

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Web-based interface for electronic reporting
- 25%: 4
- 50%: 1
- 75%: 9

Batch upload of emissions data via electronic reporting
- 25%: 4
- 50%: 1

***Manual* reporting via PDF, Excel, or hard copy submittals**
- 25%: 7
- 50%: 1
- 75%: 3

Legend: ■ 25% ■ 50% ■ 75%

Survey Question: In your estimation, to what extent are QA/QC procedures automated in your reporting system (0-100%)?
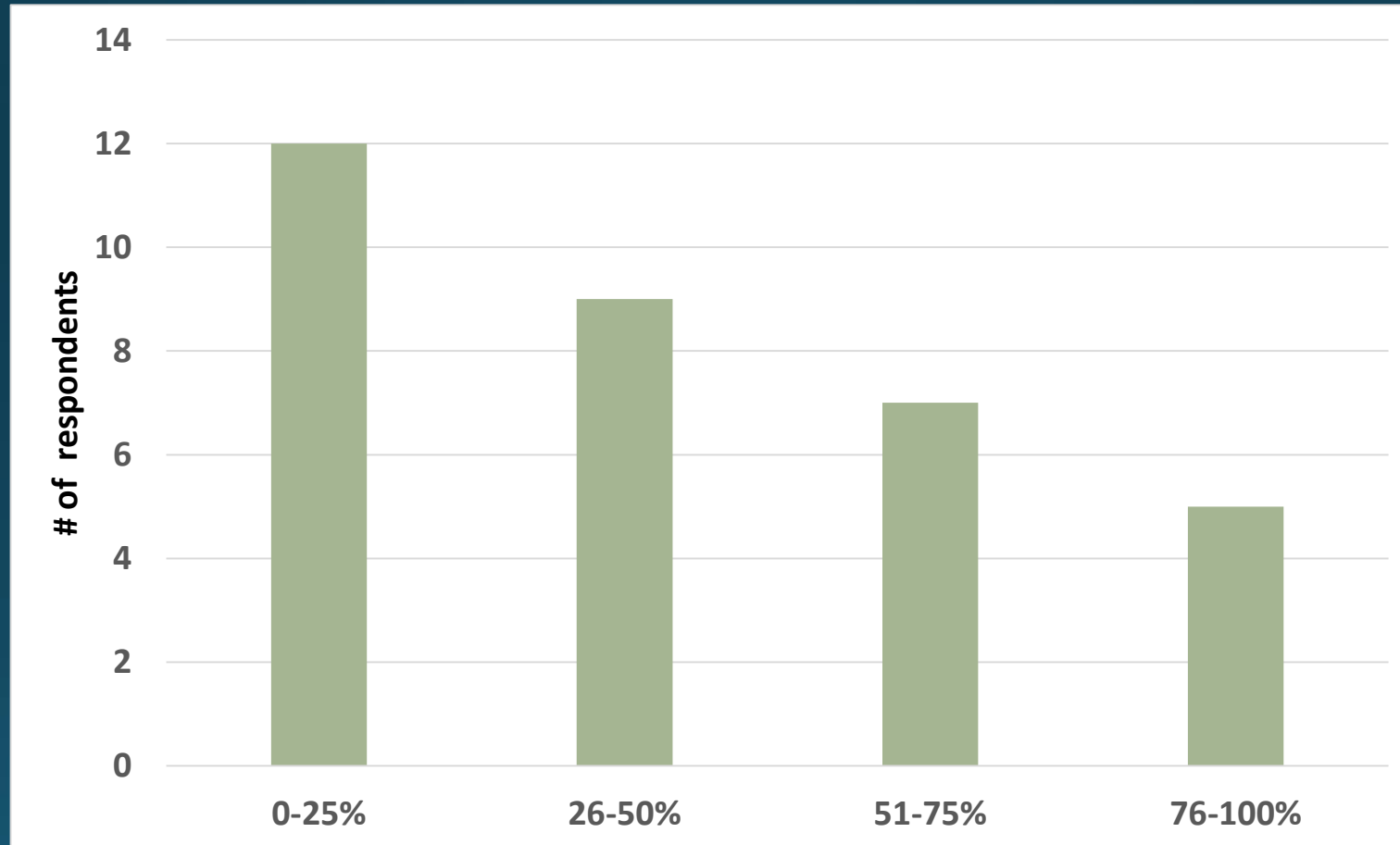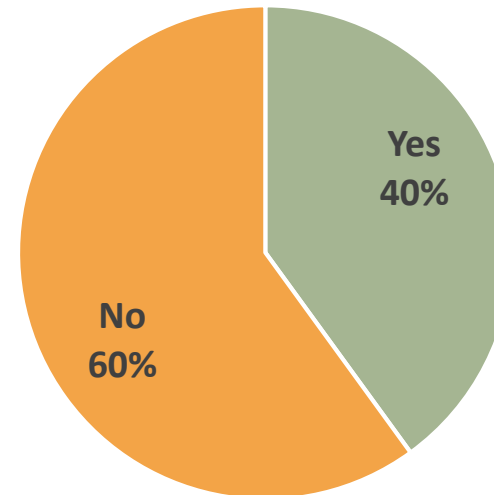
Survey Question: In your QA/QC system, are your EI and permitting systems integrated? If so, are there QA/QC checks that rely on this integration?

In your QA/QC system, are your EI and permitting systems integrated?

Yes
15%

No
85%
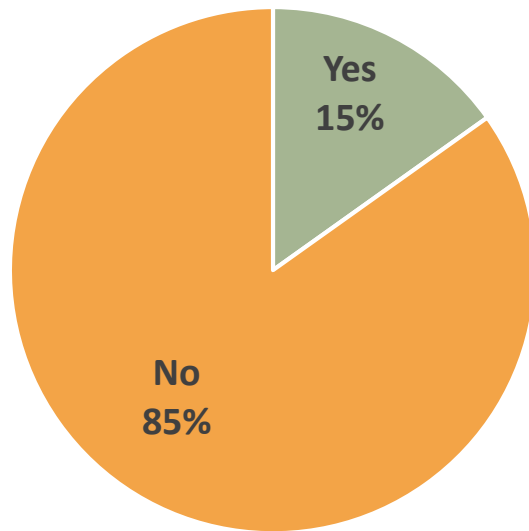
If your EI and permitting systems are integrated, are there QA/QC checks that rely on this integration?

Yes
40%

No
60%

QA/QC Project – Results and Findings

Additions to starting-point tables of QA/QC checks

- Twelve SLT programs provided unique, additional QA/QC checks to the starting-point tables provided in the survey:
    - About 34 checks were added for a total of 148 checks
    - Many of the additions reflected valuable extensions or variants of starting point checks
        - E.g., checking <u>emission factor</u> deviation for outliers in addition to simply *emissions* deviations

- Based on the additions and comments received, the team believes the revised compilation reflects a fairly comprehensive set of the most commonly applied QA/QC checks and procedures in use by SLTs and EPA emissions reporting programs.

- The compilation is not intended to reflect every possible check or procedure in use by different programs, particularly ones that are specifically unique to a certain process flow or functionality of a program's reporting system.

QA/QC Project – Results and Findings

Survey Respondents' Comments Received

- Provide and document as many QA/QC checks as possible *up-front* in the work-flow to reduce the likelihood of duplicative QA/QC work by downstream reviewers.
  - o Important to differentiate between those checks/procedures exposed to reporters while submitting data and those available to regulators.
- Recognition of the value in – but also costs associated with – adopting or modifying an electronic reporting system to implement certain automated checks.
  - o E.g., many recognized potential value in checking emissions data against permitting information. Relatively few data management systems, however, have fully integrated emissions reporting and permitting info systems.
- Need to look at cost/benefit of attempting to automate what are normally run as 'manual type' checks.
- Beware of increasing the number of "false warnings" resulting from some automated checks.
- Checks dependent on cross-walking source classification codes (SCCs) and pollutant emission factors will require up-to-date and accurate reference data tables that can be readily accessed.

QA/QC Project – Next Steps

Draft Phase 1 Project Report was completed in July

- Currently under review by CAER Project Design Team (PDT); finalization by end of Aug 2017
- Summary of research, survey results and findings
- Finalize the comprehensive list of collected 'common' QA/QC checks and procedures (dedupe, follow up for clarification, etc.)
- Recommendations for next phase of project
- Final report will be made available via the CAER public website:
  - https://www.epa.gov/e-enterprise/e-enterprise-combined-air-emissions-reporting-caer
  - Comments can be submitted to CAER mailbox at: CAER@epa.gov

Project Team recommendations for second phase of the QA/QC Project will be considered by the CAER PDT in September timeframe.

QA/QC Project – Next Steps

Recommended Next Steps for the QA/QC Project

- Distribute the compiled QA/QC checks and survey results to all SLTs to make program comparisons:
  - Opportunity for programs to see if there are additional QA/QC checks that might help to improve their current QA/QC process.
  - Opportunity for SLTs to submit additional suggestions to supplement the listing.
  - Consider posting and maintaining the QA/QC checks list on website as an inventory reference source for SLTs.

- Use the common set of QA/QC procedures as part of a Common Emissions Form (CEF) approach within CAER:
  - Explore aligning or customizing 'standard' sets of QA/QC procedures with the different CAER CEF workflow scenarios.
  - Match-up recommended set of automated QA/QC checks to CEF data fields resulting from emissions data model team.
  - Pilot demonstration to incorporate QA/QC checks as part of a CEF.

QA/QC Project Team

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