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SECTOR POLICIES AND PROGRAMS DIVISION
OFFICE OF AIR QUALITY PLANNING AND STANDARDS
OFFICE OF AIR AND RADIATION

DATE: November 30, 2016

SUBJECT: Electronic Reporting for Subpart MM Excess Emission Reports

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TO: EPA-HQ-OAR-2014-0741

I. Introduction

The U.S. EPA is reviewing the National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semicemical Pulp Mills, (40 CFR part 63, subpart MM) originally promulgated on January 12, 2001 to fulfil the residual risk and technology review (RTR) requirements under Clean Air Act (CAA) sections 112(f)(2) and 112(d)(6). As part of the RTR, the EPA is proposing additional amendments to subpart MM, including requiring electronic reporting of excess emission reports.

The purpose of this memorandum is to provide background on electronic reporting requirements, and to present examples of the electronic reporting forms and a spreadsheet template that could be used by pulp and paper facilities to submit electronic excess emissions reports.

II. General Electronic Reporting Information

A. Background

In 2011, in response to Executive Order 13563 (Improving Regulation and Regulatory Review), the EPA developed a plan to periodically review its regulations to determine if they should be modified, streamlined, expanded, or repealed in an effort to make regulations more effective and less burdensome. The plan, titled *Improving Our Regulations: Final Plan for Periodic Retrospective Reviews of Existing Regulations*,¹ includes replacing outdated paper reporting with electronic reporting. In keeping with this plan and the White House's Digital Government Strategy (titled, *Digital Government: Building a 21st Century Platform to Better*

¹ Available at: https://www.epa.gov/sites/production/files/2015-09/documents/eparetroreviewplan-aug2011_0.pdf.

Serve the American People),² in 2013 the EPA issued an agency-wide policy specifying that new regulations will require reports to be electronic to the maximum extent possible.

In recent years, the EPA has added electronic reporting requirements to 40 CFR part 63 NESHAP as the RTR of each rule is completed. Similarly, electronic reporting requirements have been added to NSPS under 40 CFR part 60 as technology reviews are completed. On March 20, 2015 (80 FR 15100), the EPA proposed to expand electronic reporting requirements to require industrial sources to electronically submit to the EPA specific air emissions data reports required under the NSPS program (40 CFR part 60). The proposal would require summary reports, excess emission reports, performance test reports, performance evaluation reports, and other similar reports required by specific rules in 40 CFR part 60 to be submitted electronically. These reports are already submitted in hard copy or electronically to the delegated authority. As explained in rulemaking proposals, electronic reporting is intended to improve access to air emissions reports for state, local, and tribal pollution control agencies and the public. Data from these reports would be readily available through WebFIRE, an EPA maintained website.

B. Electronic Reporting Systems

The Central Data Exchange (CDX) is the EPA's electronic reporting site and is located at <https://cdx.epa.gov/>. The CDX is the point of access for electronic data submittal to EPA reporting systems such as the Compliance and Emissions Data Reporting Interface (CEDRI). As shown in Figure 1, the following types of reports are submitted through CEDRI:

- Performance test and performance evaluation data such as stack testing and relative accuracy test audit (RATA) data as created with the Electronic Reporting Tool (ERT);
- Compliance status reports (or Notification reports) are submitted through a portable document format (PDF) upload; and
- Air emission reports, such excess emission reports, are submitted through the CEDRI using either fillable web forms in CEDRI (if available) or a file upload (e.g., spreadsheet template if no web form is available).

In order to submit data electronically through the CDX, users must register with CDX. An Online Registration User Guide is available at <https://cdx.epa.gov/About/UserGuide>. If a user has previously registered with CDX but has forgotten the account password, the user can use the "Forgot Password" link accessible from the CDX homepage. The user will have to provide the email address and username for the account, and answer a security question in order to receive an email with instructions on how to reset the password.

² Available at: <https://www.whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government-strategy.pdf>.

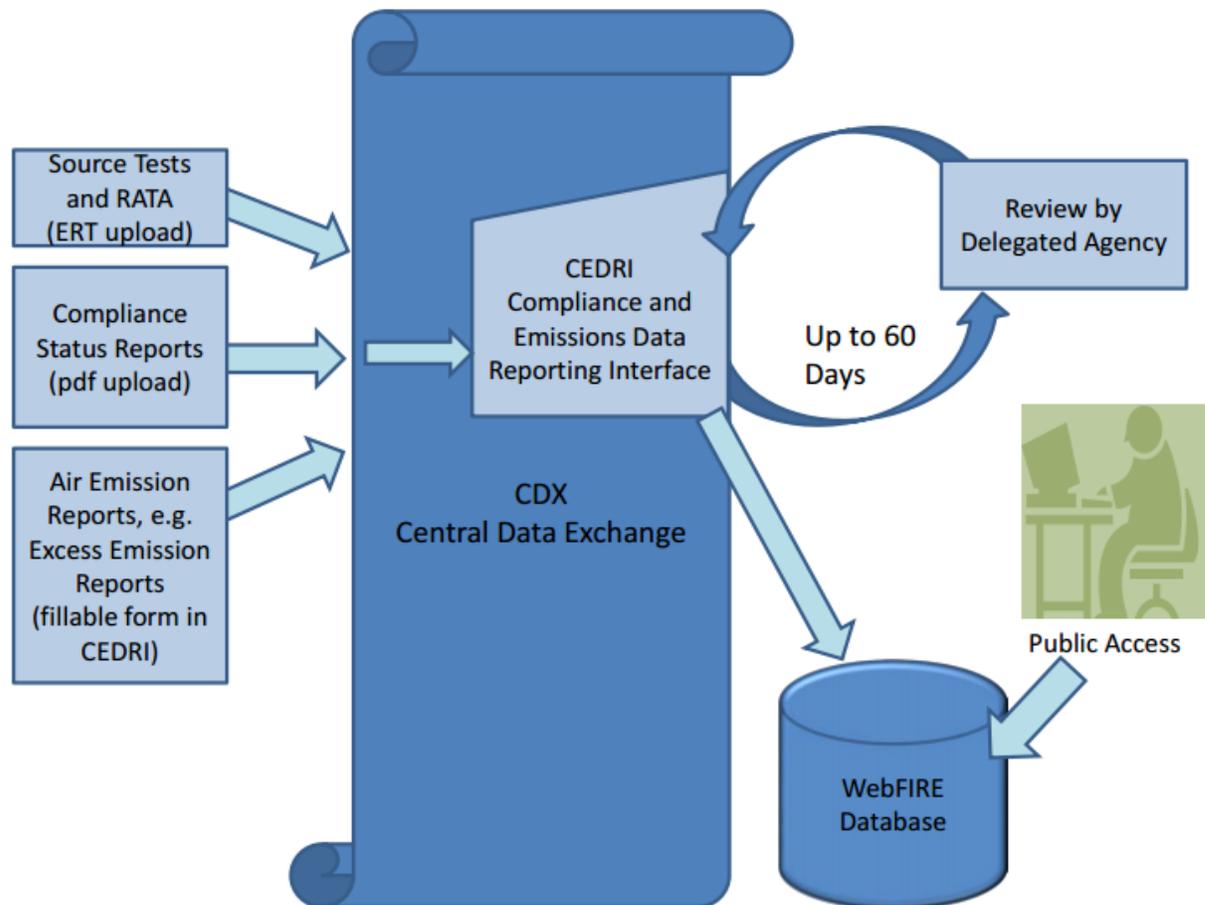


Figure 1: EPA's Electronic Reporting Schema

The CEDRI program service supports the submittal of three types of reporting: performance test reports, notification reports, and air emission reports. Performance test reports use the ERT in Microsoft Access to generate files containing emissions source test data. Facilities upload these files to CDX using CEDRI. Notification reports or Notification of Compliance Status (NOCS) reports are typically submitted by a regulated facility that notifies the designated authority that the facility has achieved compliance with an applicable regulation. Most of these reports will be uploaded through CEDRI in PDF format. Air emission reports are periodic reports submitted to the delegated authority after the facility achieves initial compliance that demonstrate that the facility has maintained continuous compliance with an applicable regulation over the reporting period. The electronic submittal of air emissions reports (specifically, semiannual excess emissions reports) is proposed in the subpart MM RTR.

There are different roles located within CEDRI. For reporting facilities, a user can be a Preparer, a Certifier, or a Delegated Certifier. The Preparer is the person responsible for the preparation of reports for signature. The Preparer may not sign and submit the report(s) and the Preparer only has access to packages which they have prepared. The Certifier is authorized to modify the package a Preparer has assembled, and sign and submit the package to CDX. The Certifier may also perform the same tasks as the Preparer. Finally, the Delegated Certifier is a

person granted authority by a registered Certifier to sign and submit packages on behalf of the Certifier. The Delegated Certifier is authorized to modify the package a Preparer has assembled, and sign and submit the package to CDX. This memo focuses on the tasks performed by the preparer.

The EPA has developed a CEDRI User’s Guide to explain system requirements, help users register and use the system, as well as develop profiles for their facilities. The User’s Guide is available online at <https://www3.epa.gov/ttn/chief/cedri/UserGuide.pdf>. The User’s guide also provides guidance on creating and preparing a new submission package, submitting a package, viewing previous submissions, and how to use the Air Emission Report Forms.

III. Electronic Reporting for Subpart MM

A. Proposed Reporting Requirements

As discussed in the preamble to the proposed amendments to subpart MM, the EPA is proposing to require facilities subject to subpart MM to submit compliance reports electronically. Table 1 lists the compliance reports required under §63.867 of subpart MM and the format for submittal of the reports. Specifically, the EPA is proposing that owners and operators submit ERT-generated performance test reports along with notifications and semiannual reports through CEDRI. Under current requirements, paper reports are often stored in filing cabinets or boxes, which make the reports more difficult to obtain and use for data analysis and sharing. Electronic storage of such reports would make data more accessible for review, analysis, and sharing. Electronic reporting can also eliminate paper-based, manual processes, thereby saving time and resources, simplifying data entry, eliminating redundancies, minimize data reporting errors and providing data quickly and accurately to the affected facilities, air agencies, the EPA, and the public. The EPA is proposing to reduce reporting frequency in subpart MM from quarterly to semiannually because the data will be more readily available to regulatory authorities.

Table 1. Reports Required Under 40 CFR Part 63, Subpart MM

| Reports in §63.867 | Formats for report submittal in CEDRI specified in §63.867(d) |
|---|--|
| (a) Notifications | User PDF upload |
| (b) Reporting for HAP metals standards (PM bubble calculation notifications) | User PDF upload |
| (c) Excess emissions report (1) Summary report (2) <i>Reserved</i> (3) Detail report (4) Failures | CEDRI web forms or XML, OR Spreadsheet template or XML |
| (d)(1) Performance test reports | ERT Access data base format or XML for ERT methods, OR Uploaded PDF of reports containing non-ERT test methods (e.g., Method 308 methanol tests) |

The EPA is proposing that subpart MM performance test reports be prepared through the ERT and submitted in CEDRI. All of the test methods listed under the subpart are currently supported by the ERT, with the exception of Method 308 in 40 CFR part 63, appendix A. The proposal requires that performance test results collected using test methods not supported by the ERT at the time of the test be submitted to the EPA via CEDRI in PDF using the attachment module in the ERT.

In addition to electronically reporting the results of performance tests, the EPA is proposing the requirement to electronically submit notifications and the semiannual excess emissions reports and/or summary reports required in §63.867. The proposal would require the owner or operator use the appropriate electronic web form or spreadsheet template in CEDRI for the subpart or an alternate electronic file format consistent with the extensible markup language (XML) schema. The owner or operator would begin submitting reports electronically using the CEDRI form or spreadsheet template with the next report that is due, once the electronic form has been available for at least 90 days.

Several changes to the recordkeeping and reporting requirements are being proposed for subpart MM to address startup, shutdown and malfunction (SSM) and to clarify the requirements for purposes of electronic reporting. Rationale for these changes is provided in the preamble to the proposed rule. A separate memorandum titled, *Redline Version of 40 CFR Part 63, Subpart MM Showing Proposed Changes*, in docket EPA-HQ-OAR-2014-0741 presents a redline-strikeout version of subpart MM showing the specific changes proposed.

B. Example Electronic Semiannual Excess Emissions Reports

The Agency reviewed the subpart MM reporting requirements, the General Provisions reporting requirements, and the format of excess emissions reports submitted by industry to determine reporting formats and contents. Facilities could be provided three options for submitting the reports electronically: CEDRI fillable web forms, a spreadsheet template, and corresponding XML schema. The EPA is interested in comments on which of these methods would be preferred by subpart MM report preparers and users. The EPA is also interested in comments regarding utility of electronic reports for demonstrating both NSPS and NESHAP subpart MM compliance, and suggestions for streamlining report content across multiple rules. This section will discuss the CEDRI fillable web forms and the spreadsheet template. It will not discuss XML schema as these would be developed in conjunction with the CEDRI fillable web forms or spreadsheet template.

1. CEDRI Fillable Web Forms

A fillable form through CEDRI could be made available for facilities to submit both the summary report and the excess emissions report. These fillable forms have not yet been developed for subpart MM, but could be developed pending public comment on the draft spreadsheet template presented with this memo. Web forms would be available on the “Use Selected Report(s)” dropdown menu after selecting the subpart for which the report is being submitted. Figure 1 shows an example for subpart ZZZZ, Stationary Reciprocating Internal

Combustion Engines. First, the user would select “Part 63” in the dropdown menu next to “Sort By.” In the example, the user has selected “Part 63 – Subpart ZZZZ.” Once selected, the available reports show up in the next dropdown menu. For subpart ZZZZ, report options are the annual report under section 63.6650(h)(3), a bulk upload of the annual report, a notification report, and a performance report. Similar report options that will be available under subpart MM.

4. For each of the subparts below, use the drop-down list to select the reports you wish to submit for that subpart, then click the “Use Selected Report(s)” button to create those reports.

Sort By Collapse All

Part 63 – National Emission Standards for Hazardous Air Pollutants for Source Categories
Subpart ZZZZ – ✖

Subpart ZZZZ - Stationary Reciprocating Internal Combustion Engines

Note: Under federal regulation for this subpart, you must electronically submit:

- 63.6650(h)(3) Annual Report

Your Permitting Authority may require you to electronically submit reports identified as (Optional).

1 selected

Check all Uncheck all ✖

- 63.6650(h)(3) Annual Report
- Bulk Upload of 63.6650(h)(3) Annual Report
- Notification Report (Optional)
- Performance Report (Optional)

Figure 1: Report Selection

After selecting the “Annual Report” from the drop down menu in Figure 1 and clicking the “Use Selected Report(s)” button, the screen in Figure 2 appears. From this page, facilities are able to fill out the existing form using the “Create/Edit Form(s)” link, upload XML data using the “Upload XML Data” link, or download templates using the “Click here to access templates and schemas” link. The spreadsheet template discussed in the next section would be available through the last link.

▼
Part 63 – National Emission Standards for Hazardous Air Pollutants for Source Categories
✕

Subpart ZZZZ – In Progress
⚠

Subpart ZZZZ - Stationary Reciprocating Internal Combustion Engines

Note: Under federal regulation for this subpart, you must electronically submit:
 • 63.6650(h)(3) Annual Report
 Your Permitting Authority may require you to electronically submit reports identified as (Optional).

Select Reports ▼

Use Selected Report(s)

63.6650(h)(3) Annual Report
✕

| | |
|---------------------|--|
| Report Status | In Progress ⚠ |
| Status Date | Mon Oct 17 13:59:52 EDT 2016 |
| Form ID | |
| Reporting Utilities | Click here to access templates and schemas |

[Create/Edit Form\(s\)](#) ✎
[Upload XML Data](#) 📄

Save And Complete Later

Notify Certifier(s)

Figure 2: Selected Annual Report

Selecting the “Create/Edit Form(s)” link results in a new window containing the form to appear, as shown in Figure 3. This welcome page for the form explains who should fill out the report, how to navigate the report, and how to submit the package. The navigation on the left of the welcome page allows the user to switch between different parts of the report. These menu options will be similar to the spreadsheet tabs of the spreadsheet template discussed in the following section.

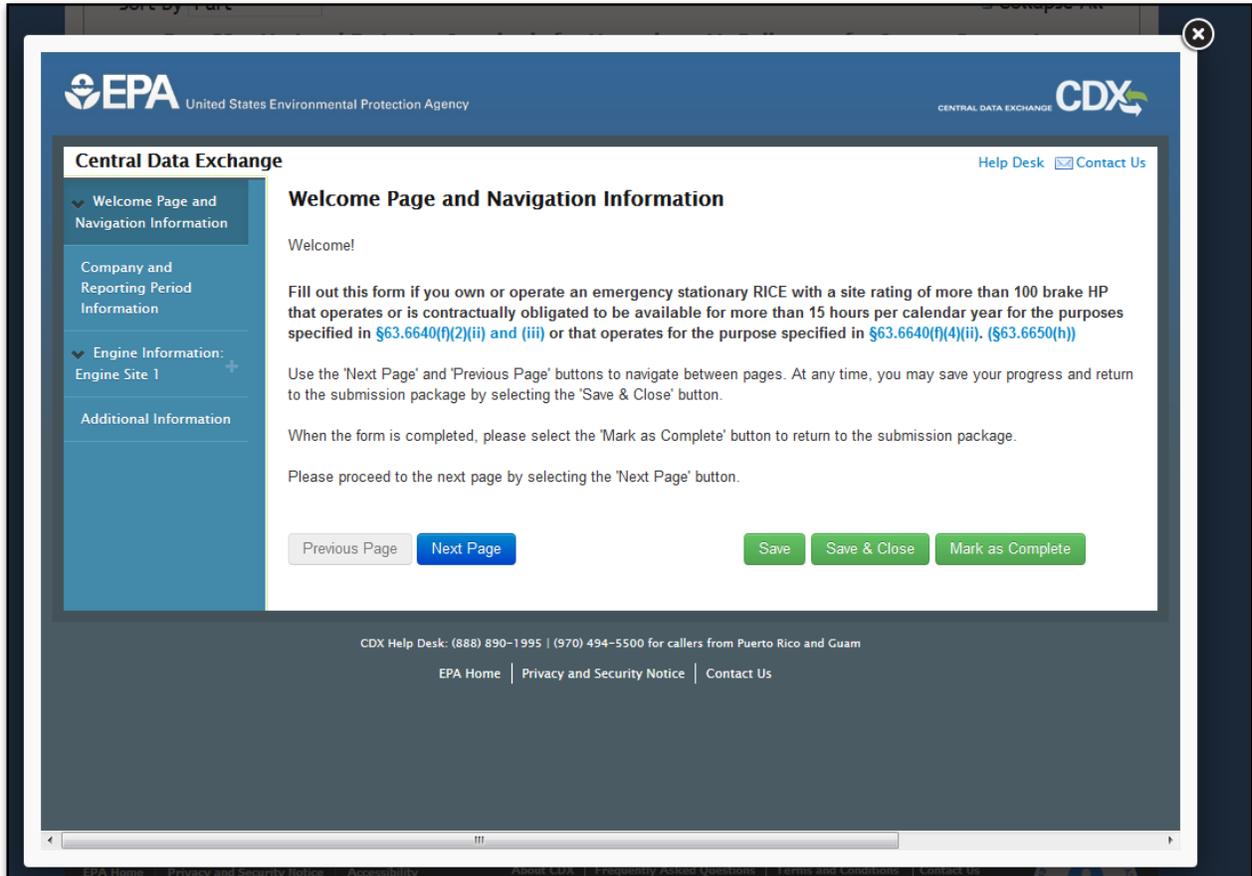


Figure 3: Report Welcome Page

The “Company and Reporting Period Information” page (Figure 4) appears after clicking “next” or the link in the navigation pane. This information is prepopulated based on the details in the Create/Edit Submission Package page. You must return to the Create/Edit Submission Package page and select Edit Details to change this information, if it needs to be updated. The reporting period section automatically fills the date the report is started in CEDRI and the user enters the beginning and ending date of the report.

Company and Reporting Period Information
The asterisk (*) next to each field indicates that the corresponding field is required. (§63.6650(h)(1)(i))

Company Information

Provide your company name and address where the engine is located. (§63.6650(h)(1)(i))

Company Name
US EPA RESEARCH TRIANGLE P

Address where the Engine is located
86 TW ALEXANDER DRIVE

Address 2
null

City
DURHAM

County
DURHAM COUNTY

State
NC

Zip Code
27711

Note: If you wish to edit your Company details, you may save your progress and return to the submission package by selecting the 'Save & Close' button. Your Company details are available within the Submission Package and can be modified under step 2.

Reporting Period Information

Provide the date of the report and beginning and ending dates of the reporting period. (§63.6650(h)(1)(ii))

Date of Report
2016-10-17

Beginning Date of Reporting Period *
[Empty]

Ending Date of Reporting Period *
[Empty]

Previous Page Next Page Save Save & Close Mark as Complete

Figure 4: Company and Reporting Period Information Page

After checking the company information and adding the reporting period dates, the user will go to the rule specific data elements in the form. In the ZZZZ example in Figure 5, engine information specified in the subpart is required. The subpart MM required data elements will be available here once the forms are developed. The “Additional Information” link in the navigation pane has space for any additional information the user would like to provide for the report.

Welcome Page and Navigation Information

Company and Reporting Period Information

Engine Information: Engine Site 1

Additional Information

Engine Information:

The asterisk (*) next to each field indicates that the corresponding field is required.

Provide the engine site rating and model year. (§63.6650(h)(1)(iii))

| | | |
|--|---|---|
| Engine Description <input type="text" value="Engine Site 1"/> | Engine Site Rating (Brake Horsepower) * <input type="text"/> | Engine Model Year * <input type="text"/> |
|--|---|---|

Provide the latitude and longitude of the engine in decimal degrees reported to the fifth decimal place. (§63.6650(h)(1)(iv))

| | |
|--|---|
| Latitude of the Engine * <input type="text"/> | Longitude of the Engine * <input type="text"/> |
|--|---|

Provide the hours operated for the purposes specified in §63.6640(f)(2)(ii) and (iii), including the date, start time, and end time for engine operation for the purposes specified in §63.6640(f)(2)(ii) and (iii). (§63.6650(h)(1)(v))

Did you use this engine for the purpose specified in §63.6640(f)(2)(ii): Energy Emergency Level 2?

Please select: *

Yes
 No

Did you use this engine for the purpose specified in §63.6440(f)(2)(iii): Voltage deviation or frequency of 5% or greater below standard voltage or frequency?

Please select: *

Yes
 No

Provide number of hours the engine is contractually obligated to be available for the purposes specified in §63.6640(f)(2)(ii) and (iii). (§63.6650(h)(1)(vi))

Hours the engine is contractually obligated to be available for the purpose specified in §63.6640(f)(2)(ii):
Number of Hours *

Hours the engine is contractually obligated to be available for the purpose specified in §63.6640(f)(2)(iii):
Number of Hours *

Provide hours spent for operation for the purpose specified in §63.6640(f)(4)(ii), including the date, start time, and end time for engine operation for the purposes specified in §63.6640(f)(4)(ii). Also, identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine. (§63.6650(h)(1)(vii))

Did you use this engine for the purpose specified in §63.6640(f)(4)(ii): 50 hours per year for non-emergency situations?

Please select: *

Yes
 No

If there were deviations from the fuel requirements in §63.6604 that apply to the engine (if any), provide the information on the number, duration, and cause of deviations, and the corrective action taken. (§63.6650(h)(1)(ix))

Were there deviations from the fuel requirements in §63.6604?

Please select: *

Yes
 No

Note: If you are providing reporting information for multiple engines within this Company please click the (+) icon within the Engine Information tab on the left navigation bar. An additional "Engine Information" page will be displayed and you may provide related information as necessary.

Previous Page
Next Page
Save
Save & Close
Mark as Complete

Figure 5: Subpart Specific Requirements Page

2. Spreadsheet Template

A spreadsheet template was developed in Microsoft Excel® 2016 to facilitate semiannual excess emissions reporting under 40 CFR part 63, subpart MM. The draft spreadsheet template and a populated example of the template have been placed in docket EPA-HQ-OAR-2014-0741 accompanying this memorandum. Completion and submission of the spreadsheet through CEDRI would fulfill the reporting requirements in §63.867(c) and (d).

The spreadsheet template workbook contains multiple worksheets or “tabs.” Each tab is configured with pull-down menu choices (where appropriate) and instructions. Gray and green tabs are included for the summary report titled, *Summary Report - Gaseous and Opacity Excess Emissions and Continuous Monitoring Systems Performance Report* required under §63.867(c)(1). Orange tabs are included for the detailed excess emissions report required under §63.867(c)(3), titled *Excess Emissions and Continuous Monitoring System Performance Report*. The detailed report tabs are required for process units if:

- Total CMS downtime is greater than 5 percent of the total source operating time during the reporting period, or
- The CMS shows excess emissions for more than 1 percent of the operating time in the reporting period, or
- There was a violation according to §63.864(k)(2) of subpart MM.

Tables 2A and 2B provide a brief description of the purpose of each spreadsheet tab. All semiannual excess emissions reports would include information in the gray tabs. The gray tabs include facility, process unit, and monitoring equipment information that varies very little from one semiannual reporting period to the next. Report preparers could complete the gray tabs once and save the workbook for subsequent reporting periods. Preparers would only need to review the data provided and update it if needed (e.g., if there was a change in process units, air pollution controls, or monitoring equipment).

As shown in Table 2A, the green summary report tabs would be completed in addition to the gray tabs. The green tabs include the summary report information for each process unit. One green tab would be completed for each process unit at the facility such as a recovery furnace, lime kiln, SDT, semichemical combustion unit, or sulfite combustion unit. Each green template tab could be copied to create the required tabs for each process unit at the facility the first time the reporting template is used. Preparers could save a copy of the spreadsheet with facility information and the proper number of tabs for each process unit set up and partially populated for subsequent reporting periods.

Once populated, the green tabs contain conditional formatting and formulas to highlight when a corresponding detailed report is needed for the process unit. The detail-report orange tabs are required for a process unit monitored parameter when excess emissions exceed 1%, when CMS downtime exceeds 5%, or a violation according to §63.864(k)(2) is triggered. Table 2B lists the detail report tabs. The detail-report orange tabs must be completed in addition to the gray and green tabs if the detailed excess emissions report is required for a process unit. Reporting monitoring exceedances in the detail-report orange tabs does not necessarily constitute a violation of the applicable standard unless the criteria in §63.864(k)(2) are reached. Table 3

summarizes the violation criteria from §63.864(k)(2). Both the CMS Performance Detail and Excess Emissions Detail tabs are required for any process unit monitoring parameter that triggers detailed reporting. The orange “Failures” tab is required if a violation of an emission limit or operating limit occurred during the reporting period. Failures include violations of the emission limits or operating limits under subpart MM.

Table 2A. Contents of the 40 CFR Part 63, Subpart MM Reporting Spreadsheet Template – Summary Report

| Spreadsheet Tab | Notes | Subpart MM references |
|---|--|--------------------------------------|
| Gray tabs to be completed by all reporters as part of the semiannual summary report | | |
| Welcome | Overview instructions page. | |
| Facility_Info | Company name, address/location, FRS ID, and reporting period dates. | §63.867(c)(1)(i)-(ii) |
| Unit_Info | List of process units included in the report, APCD, and applicable subpart MM emission limits. | §63.867(c)(1)(iii)-(iv) |
| Monitoring_Info | List of monitoring equipment used for each process unit, including monitoring equipment description, manufacturer, model number and date of last CMS certification or audit. | §63.867(c)(1)(v) and (vi) |
| Green tabs to be completed by all reporters as part of the semiannual summary report | | |
| COMS | To be completed for ESP-controlled recovery furnaces and lime kilns with COMS. Multiple emission points can be specified. Requests the duration (minutes) and the number of averaging periods excess emissions are recorded. | §63.867(c)(1)(iv), (vii), and (viii) |
| ESP-Semiannual | Semiannual ESP parameter averages for recovery furnaces or lime kilns with COMS. | §63.867(c)(1)(iv), (vii), and (viii) |
| CPMS | To be completed for wet scrubber parameters, RTO temperature, combined ESP/scrubber parameters, and alternative parameters. Multiple parameters can be specified for the same process unit. Requests the duration (hours) and the number of averaging periods excess emissions are recorded. | §63.867(c)(1)(iv), (vii), and (viii) |
| CPMS-Process-Control_Changes | Includes description of CMS, process, or control changes since the last reporting period. | §63.867(c)(1)(ix) |
| Certification | Responsible official contact information and certification. | §63.867(c)(1)(x) |

Table 2B. Contents of the 40 CFR Part 63, Subpart MM Reporting Spreadsheet Template – Detailed Report

| Spreadsheet Tab | Notes | Subpart MM references |
|--|---|--|
| Orange tabs required for parameters requiring detailed excess emissions reporting | | |
| CMS Performance Detail | To be completed for each parameter monitor requiring a detailed report. Includes date/time, duration, and type of CMS inoperative or out of control periods, nature and cause of monitoring malfunctions and the corrective action, CMS repair or adjustment. | §63.867(c)(3)(i)-(ii), (iv)-(vi) and 63.867(c)(1)(viii) |
| Excess Emissions Detail | To be completed for each parameter monitor requiring a detailed report. The duration, cause of the exceedance or malfunction, and corrective action are noted. Data to be excluded from averages are flagged. | §63.867(c)(3)(iii)(A)(5), (B)(5), (C)(3), (D)(3);* and §63.867(c)(3)(iv)-(v); and §63.867 (c)(4) |
| Failures | To be completed for process unit emission limit or operating limit violations. Includes duration of the violation and estimated emissions associated with the violation. | §63.867(c)(4) |

*The requirements for §63.867(c)(3)(iii)(A)(1)-(4), (B)(1)-(4), (C)(1)-(2), and (D)(1)-(2) are covered in the summary reporting tabs and need not be repeated in the detailed reporting tabs.

Table 3. Summary of Violation Levels Under Specified in 40 CFR Part 63, Subpart MM

| Parameters | Violation levels: Number of averaging periods during times when spent liquor or lime mud is fired within the semiannual reporting period according to §63.864(k)(2) |
|---|---|
| ESP-Controlled Kraft/Soda Recovery Furnaces and Lime Kilns Measuring Opacity | |
| Recovery furnace opacity | Opacity greater than 20% for 2% or more of operating time* |
| Lime kiln opacity | Opacity greater than 20% for 1% or more of operating time* |
| ESP secondary voltage | Semiannual average is below minimum limit |
| ESP secondary current | Semiannual average is below minimum limit |
| ESP total secondary power | Semiannual average is below minimum limit |
| Other CPMS | |
| ESP secondary voltage ¹ | 6 or more 3-hour averages are below the minimum limit |
| ESP secondary current ¹ | 6 or more 3-hour averages are below the minimum limit except during S/S |
| ESP total secondary power ¹ | 6 or more 3-hour averages are below the minimum limit except during S/S |
| Scrubber liquid flow | 6 or more 3-hour averages are below the minimum limit |
| Scrubber pressure drop | 6 or more 3-hour averages are below the minimum limit except during S/S |
| SDT scrubber fan amperage | 6 or more 3-hour averages are below the minimum limit |
| RTO temperature (3-hr) | Any 3-hour average falls below the minimum limit |
| RTO temperature (1-hr) | Not applicable. The 1-hr value triggers corrective action only; violations are based on the 3-hr average. |
| Alternative parameter (3-hr) | 6 or more 3-hour averages do not meet the limit |
| Hog fuel dryer at Cosmopolis, WA mill ² | Corrective action is not initiated within 1 hour of alarm and the alarm is engaged for more than 5% of total operating time |

¹ESP parameter monitoring required when an ESP is used in conjunction with a wet scrubber.

²Bag leak detection reporting is not included in the spreadsheet template for the Cosmopolis, WA mill. Semiannual reports in an alternative format will need to be provided by this mill.