COMMENTS OF THE ELECTRIC POWER RESEARCH INSTITUTE ON

ENVIRONMENTAL PROTECTION AGENCY

[EPA–HQ–OAR–2018–0794; FRL–6716.2–01–OAR]

National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units - Revocation of the 2020 Reconsideration, and Affirmation of the Appropriate and Necessary Supplemental Finding

April 8, 2022

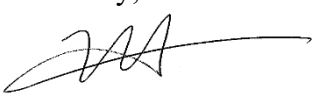
The Electric Power Research Institute, Inc. (EPRI) respectfully submits the enclosed comments on the U.S. Environmental Protection Agency's (EPA's or the Agency's) *National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units - Revocation of the 2020 Reconsideration, and Affirmation of the Appropriate and Necessary Supplemental Finding*. EPRI appreciates the opportunity to comment on this Notice of Proposed Rulemaking.

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These comments on the Notice of Proposed Rulemaking reflect EPRI's opinions derived from its research and development experience related to the study of air toxics risk assessment. These comments reflect EPRI's research activities in that they are technical rather than legal in nature. The enclosed comments reflect only EPRI's opinion and expertise and do not necessarily reflect the opinions of those supporting and working with EPRI to conduct collaborative research and development.

EPRI hopes its comments and technical feedback will be valuable to EPA.

Sincerely,



Neva Espinoza
Vice President, Energy Supply and Low-Carbon Resources

COMMENTS

ENVIRONMENTAL PROTECTION AGENCY

[EPA–HQ–OAR–2018–0794; FRL–6716.2–01–OAR]

National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units - Revocation of the 2020 Reconsideration, and Affirmation of the Appropriate and Necessary Supplemental Finding

Submitted by:

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April 8, 2022

The Electric Power Research Institute, Inc. (EPRI) respectfully submits the enclosed comments on the U.S. Environmental Protection Agency's (EPA's or the Agency's) *National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units - Revocation of the 2020 Reconsideration, and Affirmation of the Appropriate and Necessary Supplemental Finding*. EPRI appreciates the opportunity to comment on this Notice of Proposed Rulemaking.

On February 9, 2022, the EPA posted a Notice of Proposed Rulemaking[1] which proposes to revoke the May 22, 2020, Supplemental Finding and reaffirm the 2016 finding that it is appropriate and necessary to regulate Hazardous Air Pollutants (HAPs) from coal- and oil-fired utility electric generating units (EGUs). In addition, EPA is initiating a review of the residual risk and technology review (RTR) for the Mercury and Air Toxics Standards (MATS) which was conducted in support of the 2020 Final Rule[2]. EPRI is providing comments related to the MATS residual risk review that EPA is initiating. In addition, EPRI is providing comments on the supplemental Technical Support Document[3], dated September 2, 2021, which discusses an analysis to further characterize human health risks from the source category. This document focuses on risk of myocardial infarction (MI) deaths, risk of IQ point loss for children, and the potential for increased MI mortality for the subsistence fisher population.

[1] Docket ID No. EPA–HQ–OAR–2018–0794, https://www.regulations.gov/docket/EPA-HQ-OAR-2018-0794.
[2] *Residual Risk Assessment for the Coal- and Oil-Fired EGU Source Category in Support of the 2020 Risk and Technology Review Final Rule, September 2019*. Posted May 22, 2020. https://www.regulations.gov/document/EPA-HQ-OAR-2018-0794-4553.
[3] EPA-HQ-OAR-2018-0794-4605, https://www.regulations.gov/document/EPA-HQ-OAR-2018-0794-4605.

Comments on Residual Risk Review

In 2018, EPRI published two reports summarizing EPRI's study of post-MATS HAPs emissions and health risk assessment for coal-fired power plants.

1. *Hazardous Air Pollutants (HAPs) Emission Estimates and Inhalation Human Health Risk Assessment for U.S. Coal-Fired Electric Generating Units: 2017 Base Year Post-MATS Evaluation.* EPRI, Palo Alto, CA: 2018. 3002013577. https://www.epri.com/research/products/000000003002013577
2. *Multi-Pathway Human Health Risk Assessment for Coal-Fired Power Plants.* EPRI, Palo Alto, CA: 2018. 3002013523. https://www.epri.com/research/products/000000003002013523

In the above studies, EPRI generally followed EPA guidance to characterize human health risk due to inhalation and multi-pathway exposure, however there were substantive differences between EPRI and EPA in the approach to developing emissions data relied upon to estimate risk.

Both the EPA residual risk assessment and the EPRI study concluded that inhalation and multi-pathway carcinogenic and non-carcinogenic risks for coal-fired EGUs (oil-fired EGUs were not assessed in the EPRI study) were all below EPA risk thresholds of 1 in a million for cancer risk and 1 for the chronic hazard index. The multi-pathway human health risk estimates also led to similar conclusions, with EPA and EPRI concluding that multi-pathway risks were below EPA risk thresholds. EPA assessed carcinogenic and non-carcinogenic risks in a multi-pathway screening analysis and concluded that all except mercury-related risks were within levels that the EPA deemed acceptable. EPA then conducted a refined multi-pathway assessment and determined a maximum chronic hazard index of 0.06 for mercury. This value is very similar to the maximum chronic hazard index of 0.05 from EPRI's study. EPRI also assessed carcinogenic risks in a refined multi-pathway assessment of five high-risk potential sites and calculated a maximum cancer risk of 0.2 in a million, below EPA's acceptable risk thresholds.

EPRI has previously commented[4] on the EPA RTR proposed residual risk review which was published on February 9, 2019. EPRI is now commenting on the finalized version of the residual risk review, dated September 2019, which EPA is initiating a review of as part of the Proposed Rulemaking. As detailed in the previous comments and discussed below, there are several key areas in which EPRI is proposing that EPA implement revisions to the methodology used to estimate risks associated with coal- and oil-fired EGUs.

[4] EPRI 2019. EPRI Comments on the Coal- and Oil-Fired Electric Utility Steam Generating Units—Reconsideration of Supplemental Finding and Residual Risk and Technology Review; EPA-HQ-OAR-2018-0794-1646.

Propose to Remove Contaminated Testing Data Biases for Chromium, Manganese and Nickel Emissions

EPRI has previously reviewed the 2010 Information Collection Request (ICR) test results and found that chromium, manganese, and nickel compounds were abnormally elevated in some stack gas samples. EPRI concluded that these results were due to metallic contamination introduced during sampling. Subsequent retests at seven units support this conclusion, as described in three previous sets of EPRI comments to EPA.[4,5,6]

The documentation regarding the development of emission factors and the metal emissions to filterable particulate matter (EF/FPM) ratios used in the MATS RTR for trace metal species[7] (subsequently referred to as "EPA's EF development memo") was reviewed by EPRI, and the information suggests that data used by EPA are still affected by metallic contamination.

In the following cases, EPA has used only the retest values and did not retain the original values that were skewed by metallic contamination:

- Conesville (ORIS 2840) for chromium emissions
- James River (ORIS 2161) and Gallatin (ORIS 3403) for nickel emissions
- James River (ORIS 2161) and Gallatin (ORIS 3403) for manganese emissions.

In the case of chromium, for James River Units 4 and 5 (ORIS 2161) and Gallatin Unit 2 (ORIS 3403), both the retest values and the contaminated test values were used for EF development. In other cases, the retest values were not included at all, such as for manganese at Gibson Unit 1 and Unit 2 (ORIS 6113), even though it was noted in the comment fields for the test runs in the 2010 ICR submittal that there was method blank contamination. We are noting that the retest values were implemented inconsistently. It is recommended that EPA only use the retest results, as the original 2010 ICR results that have been determined to contain metallic contamination are not appropriate for use in estimating risk.

In addition, EPA used an arithmetic average approach when calculating emission factors and emission/FPM ratios for metals and control class groups. As described in Appendix A of the previous comments to EPA on the MATS rulemaking[6], the use of median values, as opposed to the arithmetic average, is more appropriate when developing factors to estimate emissions from an untested unit when evaluating health risk at an individual unit or station is the end use.

Lastly, as previously commented on[4], there appears to be data transcription errors in the Appendix F2 table of EPA's EF development memo. As shown in the table below, for Valley Units (ORIS 4042), the arsenic emission retest values from Table 1 of the EF development memo appear to have been transcribed incorrectly to Appendix F2, resulting in incorrect

[5] EPRI 2011. EPRI Comments on Proposed HAPS MACT Rule; EPA-HQ-OAR-2009-0234-17621

[6] EPRI 2016. EPRI Comments on the Supplemental Finding That It is Appropriate and Necessary to Regulate Hazardous Air Pollutants From Coal and Oil-Fired Electric Utility Steam Generating Units; EPA-HQ-OAR-2009-0234-20554.

[7] EPA 2018. EPA Memorandum dated July 2018 to Docket ID No: EPA-HQ-OAR-2018-0794. Subject: "Emission Factor Development for RTR Risk Modeling Dataset for Coal- and Oil-Fired EGUs."

emission values for all four units at Valley. If confirmed, these errors create high bias in EPA's calculated average arsenic emission factor and average emission/FPM ratio value for the "Fabric Filter only" control device category. In addition, the nickel "735 retest" value (ORIS 4042) in Appendix F9 is 2.58E-5 lb/MMBtu. However, Table 1 of EPA's EF development memo has a value of 2.58E-4 lb/MMBtu. In the response to comments in EPA's 2020 final rule, the Agency acknowledged that "making data corrections suggested by commenters would potentially reduce risk further but would not change the determinations under the risk review". EPRI recommends that EPA correct these noted discrepancies and check for other possible discrepancies between Appendix F table metals datasets and Table 1 retest data.

Table 1. Valley Units: Inconsistencies Between Appendix F2 and Table 1 Retest Arsenic Values

ORIS	Unit	Submittal ID	Appendix F2		Table 1 Retest Values	
			EF (lb/MMBtu)	FPM (lb/MMBtu)	EF (lb/MMBtu)	FPM (lb/MMBtu)
4042	U4	736 retest	8.73E-06	4.00E-04	8.73E-07	4.00E-04
4042	U3	735 retest	1.20E-06	1.10E-03	1.12E-06	1.10E-03
4042	U2	734	4.96E-06	7.50E-04	9.97E-07	7.50E-04
4042	U1	1244	4.96E-06	7.50E-04	9.97E-07	7.50E-04

Propose to Use Emission Correlation for Non-Mercury Metals in Coal

As described in previous comments to EPA on the MATS rulemaking process[4,5,6], EPRI continues to recommend its predictive correlation methodology for estimating emissions of non-mercury HAP metals as a robust and technically sound approach. In 1995, EPRI developed emission factors that employed a predictive correlation for particulate phase metal emissions (referred to as the non-mercury HAP metals in the MATS rule)[8]. EPRI provided these approaches to EPA, which incorporated the correlations into EPA's AP-42, Vol. 1, Chapter 1.1, Bituminous and Subbituminous Coal Combustion (Table 1.1-16).

This equation states that the emission of a metallic substance is proportional to both the amount in the fuel and the amount of ash that is emitted. EPRI has updated these correlations twice since 1995. The latest update in 2014 incorporated the 2010 ICR test data.[9] These updated correlations

[8] EPRI 1995. *Emission Factors Handbook: Guidelines for Estimating Trace Substance Emissions from Fossil Fuel Steam Electric Plants*, EPRI, Palo Alto, CA: 1995. TR-105611.

[9] EPRI 2014. *Emission Factors Handbook: Guidelines for Estimating Trace Substance Emissions from Fossil-Fuel-Fired Steam Electric Power Plants.* EPRI, Palo Alto, CA: 2014. 3002003848. https://www.epri.com/research/products/000000003002003848

from 2014 were subsequently used by EPRI to estimate post-MATS emissions for the 2017 base year case and develop EPRI's post-MATS health risk assessment[10].

Propose to Update Filterable Particulate Matter (FPM) Data

FPM is a key variable for both EPRI's study and EPA's RTR analyses for coal- and oil-fired EGUs. EPRI conducted its post-MATS emission modeling and risk assessment prior to 2017, using data available at the time of the study for selected modeling input parameters[10]. FPM values used as inputs to EPRI metals emission correlations were based on 2014 FPM data as reported on EIA Form-860, or when unavailable, from EPA's WebFire database and/or FPM values from previous EPRI emission modeling efforts. If these reported values exceeded the MATS limit for FPM, the values used in the modeling analyses were set to the MATS FPM limit. This resulted in a general trend to over-predict FPM emissions by EPRI in comparison to the values used by EPA[4]. As EPRI's FPM emission estimates were predictive rather than actual, it is recommended that EPA use the latest available actual FPM emissions data to estimate residual risk, such as from the 2017 National Emissions Inventory (NEI) database.

Propose to Use a lb/TBu Emission Rate to Estimate Mass Emission Rates

EPRI observed that for HCl, EPA used EPRI's annual mass emissions as reported in the EPRI Post MATS emissions and inhalation risk study without adjustment for difference in annual heat input values between the EPRI study (based on 2015 heat input data) and actual 2017 heat input values. EPA may have used EPRI "lb/year" emissions values for other species as well. EPRI recommends calculating a unit-specific lb/TBtu heat input-based emission factors using the reported annual mass rates and annual heat input from the EPRI study and applying these factors to the 2017 annual heat input values per unit to obtain more representative estimates of 2017 emissions.

Propose to Continue Exclusion of Retired Units from the RTR

EPA's EF development memo states that retired plants were excluded from the datasets used to develop emission factors and EF/FPM ratios. It is recommended that the EF development memo be updated to exclude units which have retired since the development of the memo and that the memo be corrected to exclude units at the James River plant (ORIS 2161, retired in October 2015). It should also be emphasized that there have been a number of coal- and oil-fired EGUs which have been converted to gas-fired units or permanently shutdown since the development of the RTR, and in re-evaluating residual risk EPA should exclude these units.

Comment on Supplemental Human Health Risk Characterization Document

As stated within the EPA document[3], the purpose of the analysis is to further characterize human health risks present without the emission reductions associated with MATS compliance. EPRI therefore understands why the 2016 base year was chosen by EPA for this analysis, as it is after

[10] EPRI 2018. *Hazardous Air Pollutants (HAPs) Emission Estimates and Inhalation Human Health Risk Assessment for U.S. Coal-Fired Electric Generating Units: 2017 Base Year Post-MATS Evaluation*. EPRI, Palo Alto, CA: 2018. 3002013577. https://www.epri.com/research/products/000000003002013577

implementation of other relevant federal regulations but prior to implementation of MATS. However, it must be emphasized that the 2016 base case emissions data is not representative of current EGU operations. According to EPA, mercury emissions from EGUs in 2017 were approximately 86% lower, dropping from a total of 29 tons per year to approximately 4 tons per year[1]. Nonetheless, the study estimates that EGUs contribute only 0.48-1.8% of the risk from mercury associated with fish consumption using the 2016 base case emissions.