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Plant ID: Insert Plant ID
Plant Name: Insert Plant Name



Steam Electric Questionnaire

PART E - WASTES FROM CLEANING METAL PROCESS EQUIPMENT

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Plant ID: Insert Plant ID
Plant Name: Insert Plant Name

PART E. WASTES FROM CLEANING METAL PROCESS EQUIPMENT

INSTRUCTIONS

Complete Part E of the questionnaire for your plant. As you are completing the electronic form, note the following: When you enter your plant name and plant ID on the Part E TOC tab, all name and ID fields throughout Part E will automatically populate. Refer to the overall questionnaire instructions, the glossary, and the acronym list for assistance with completing Part E.

Please provide all free response answers in the highlighted yellow areas. Throughout Part E, you may need to make copies of certain sections/questions. Instructions are provided throughout Part E regarding making copies. Note that steam electric generating unit or metal cleaning operation names must be populated on the copied tab or section, located in the upper right corner under "Plant ID" and "Plant Name", in order to correlate the requested information with the steam electric generating unit or metal cleaning operation.

Use the Comments page at the end of Part E to do the following: provide additional information as requested in certain questions within Part E; indicate atypical data (e.g., if 2009 information is not representative of normal operations); and note methods used to make best engineering estimates in the event that exact data are not available.

Plant Name: Insert Plant ID
Plant ID: Insert Plant Name

Part: E**Section Title:** 1. Metal Cleaning Operations

Instructions: Complete Part E of the questionnaire for your plant. This part collects information on operations that produce metal cleaning wastes at the plant. Metal cleaning wastes include any *process wastewaters* resulting from cleaning [with or without chemical cleaning compounds] any metal process equipment, including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air heater cleaning. This part also collects information on combined cycle combustion turbine and air compressor cleaning, and soot blowing. For Part E of the questionnaire, report all soot blowing operations that use water or steam during the cleaning event.

CBI? Yes

E1-1. Has the plant generated any wastes from cleaning metal process equipment associated with fossil- or nuclear-fueled steam electric generating units since January 1, 2000?

 Yes

(Continue)

 No

(Skip to next Questionnaire Part)

Plant Name: Insert Plant ID
 Plant ID: Insert Plant Name
 SE Unit ID: Insert Unit ID

Part: E

Section Title: 2. Generating Unit Cleaning Data

Instructions: Complete Section 2 (Questions E2-1 and E2-2) for each fossil- or nuclear-fueled steam electric generating unit for which the plant has performed at least one cleaning operation on metal process equipment since January 1, 2000. See Part A Section 8 for unit classifications. Enter the steam electric generating unit ID under the section heading above (use steam electric generating unit IDs assigned in Table A-8). Make a copy of Section 2 for each steam electric generating unit identified in Table A-8 using the "Copy Section 2" button below. Please provide all free response answers in the highlighted yellow areas.

NOTE: Combined cycle systems are considered steam electric generating units and, therefore, any cleaning operations performed on ANY portion of a combined cycle system, including cleaning operations associated with the combustion turbine portion of the system should be reported in this part. When responding to these questions, provide answers that describe the typical cleaning operation for the steam electric generating unit.

Copy Section 2

CBI?

Yes

E2-1. In Table E-1, provide information about a typical cleaning event for each type of cleaning operation that uses chemical compounds on metal process equipment associated with fossil- or nuclear-fueled steam electric generating units. In addition, please note whether or not each type of cleaning operation occurs at the plant.

NOTE: "Typical Dose Concentration" refers to the average concentration of the chemical within the cleaning water and "cleaning event" refers to one instance in which the plant performs a cleaning operation on metal process equipment.

Table E-1. Metal Process Equipment Cleaning Operations Using Chemicals Performed on Steam Electric Generating Units

Operation ID	Type of Metal Cleaning Operation	Does Type of Cleaning Occur at the Plant?	Chemical Addition			Type of Water Used in Cleaning Operation	Typical Volume of Metal Cleaning Waste Generated per Cleaning Event (Gallons)	Typical Frequency of Cleaning Events (e.g., 1 time every 3 years)	
			Type of Chemical Used in Operation	Typical Dose Concentration for Each Chemical (Grams per Liter)	Typical Amount Added for Each Cleaning Event (Gallons)				
TUBE_CHEM	Boiler tube cleaning	<input type="radio"/> Yes <input type="radio"/> No	Process Equipment Cleaning Chemical			Type of Water		time(s) every	yrs
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
FIRE_CHEM	Boiler fireside cleaning	<input type="radio"/> Yes <input type="radio"/> No	Process Equipment Cleaning Chemical			Type of Water		time(s) every	yrs
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			

AIR_CHEM	Air heater cleaning	<input type="radio"/> Yes <input type="radio"/> No	Process Equipment Cleaning Chemical			Type of Water		time(s) every	
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
SOOT_CHEM	Soot blowing	<input type="radio"/> Yes <input type="radio"/> No	Process Equipment Cleaning Chemical			Type of Water		time(s) every	
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
ST-TURB_CHEM	Steam turbine cleaning	<input type="radio"/> Yes <input type="radio"/> No	Process Equipment Cleaning Chemical			Type of Water		time(s) every	
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			
			Other (specify):			Other (specify):			
			Process Equipment Cleaning Chemical			Type of Water			

CT-COMB_CHEM	Combustion turbine cleaning (combustion portion of turbine)	<input type="radio"/> Yes <input type="radio"/> No	Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify):		Type of Water Other (specify): Type of Water Other (specify): Type of Water Other (specify):		time(s) every	yrs
CT-COMPR_CHEM	Combustion turbine cleaning (compressor portion of combustion turbine)	<input type="radio"/> Yes <input type="radio"/> No	Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify):		Type of Water Other (specify): Type of Water Other (specify): Type of Water Other (specify):		time(s) every	yrs
Other	Other:	<input type="radio"/> Yes <input type="radio"/> No	Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify):		Type of Water Other (specify): Type of Water Other (specify): Type of Water Other (specify):		time(s) every	yrs
Other	Other:	<input type="radio"/> Yes <input type="radio"/> No	Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify): Process Equipment Cleaning Chemical Other (specify):		Type of Water Other (specify): Type of Water Other (specify): Type of Water Other (specify):		time(s) every	yrs

CBI?

Yes

E2-2. In Table E-2, provide information about a typical cleaning event for each type of cleaning operation that does not use chemical compounds on metal process equipment associated with fossil- or nuclear- fueled steam electric generating units. In addition, please note whether or not each type of cleaning operation occurs at the plant.

NOTE: "Typical Dose Concentration" refers to the average concentration of the chemical within the cleaning water and "cleaning event" refers to one instance in which the plant performs a cleaning operation on metal process equipment.

Table E-2. Metal Process Equipment Cleaning Operations Without Chemicals Performed on Steam Electric Generating Units

Operation ID	Type of Metal Cleaning Operation	Does Type of Cleaning Occur at the Plant?	Type of Water Used in Cleaning Operation	Typical Volume of Metal Cleaning Waste Generated per Cleaning Event (Gallons)	Typical Frequency of Cleaning Events (e.g., 1 time every 3 years)
TUBE_NO_CHEM	Boiler tube cleaning	<input type="radio"/> Yes <input type="radio"/> No	Type of Water Other (specify): <input type="text"/>	<input type="text"/>	<input type="text"/> time(s) every <input type="text"/> yrs
			Type of Water Other (specify): <input type="text"/>	<input type="text"/>	
			Type of Water Other (specify): <input type="text"/>	<input type="text"/>	
FIRE_NO_CHEM	Boiler fireside cleaning	<input type="radio"/> Yes <input type="radio"/> No	Type of Water Other (specify): <input type="text"/>	<input type="text"/>	<input type="text"/> time(s) every <input type="text"/> yrs
			Type of Water Other (specify): <input type="text"/>	<input type="text"/>	
			Type of Water Other (specify): <input type="text"/>	<input type="text"/>	
AIR_NO_CHEM	Air heater cleaning	<input type="radio"/> Yes <input type="radio"/> No	Type of Water Other (specify): <input type="text"/>	<input type="text"/>	<input type="text"/> time(s) every <input type="text"/> yrs
			Type of Water Other (specify): <input type="text"/>	<input type="text"/>	
			Type of Water Other (specify): <input type="text"/>	<input type="text"/>	

SOOT_NO_CHEM	Soot blowing	<input type="radio"/> Yes <input type="radio"/> No	Type of Water Other (specify):	time(s) every	yrs
ST-TURB_NO_CHEM	Steam turbine cleaning	<input type="radio"/> Yes <input type="radio"/> No	Type of Water Other (specify):	time(s) every	yrs
CT-COMB_NO_CHEM	Combustion turbine cleaning (combustion portion of turbine)	<input type="radio"/> Yes <input type="radio"/> No	Type of Water Other (specify):	time(s) every	yrs
CT-COMPR_NO_CHEM	Combustion turbine cleaning (compressor portion of combustion turbine)	<input type="radio"/> Yes <input type="radio"/> No	Type of Water Other (specify):	time(s) every	yrs
Other	Other:	<input type="radio"/> Yes <input type="radio"/> No	Type of Water Other (specify):	time(s) every	yrs
Other	Other:	<input type="radio"/> Yes <input type="radio"/> No	Type of Water Other (specify):	time(s) every	yrs

Plant Name: Insert Plant ID

Plant ID: Insert Plant Name

SE Unit ID: Insert Unit ID

Metal Cleaning Operation ID: Insert Operation ID

Part: E

Section Title: 3. Cleaning Operation Data

Instructions: Complete Section 3 (Questions E3-1 through E3-8) for each type of metal cleaning operation performed on the steam electric generating unit, which is identified in Tables E-1 and E-2 of Section 2. Make a copy of Section 3 using the "Copy Section 3" button below. Enter the steam electric generating unit ID under the section heading above (use steam electric generating unit IDs assigned in Table A-8). In addition, enter the metal cleaning operation ID performed on the steam electric generating unit (use the IDs from Tables E-1 and E-2). Please provide all free response answers in the highlighted yellow areas.

Copy Section 3

CBI?

Yes

E3-1. In the space below, provide a description of the process equipment cleaning operation. Include the type of equipment and metal cleaned, any chemical preparation steps (e.g., diluting the chemical prior to use), and a short description of the cleaning operation. An example is provided below.

Example: *The plant uses citric acid to remove copper deposits and iron oxides from the steel tube surfaces of the boiler. The citric acid is diluted to a pH of 3.5 and then used for cleaning in a two-stage process. In the first stage, the citric acid dissolves iron oxides. In the second stage anhydrous ammonia is added to raise the pH of the cleaning solution between 9 and 10 and air is bubbled through the solution to dissolve copper deposits.*

[Yellow highlighted response area]

CBI? **E3-2.** Is the cleaning waste commingled with other *process wastewaters*? If yes, indicate the process wastewaters with which the metal cleaning waste is commingled. [Check all boxes that apply.]

Yes

Yes

Fly ash transport water

Cooling tower blowdown

Bottom ash transport water

Once through cooling water

FGD scrubber purge

Other:

No

CBI? **E3-3.** What is the destination(s) of the cleaning waste? If the plant *recycles* the waste, indicate the plant process to which this waste is recycled. [Check all boxes that apply.]

Yes

Immediately recycled back to plant process. Please describe how the cleaning waste is reused:

Transferred to on-site treatment system. Identify the type of treatment system below. [Check all boxes that apply.]

Settling Pond

Constructed wetlands

pH adjustment

Other, specify:

Chemical precipitation

Discharged to surface water. Provide NPDES permitted outfall number (from Part A Section 2.2):

Indirect discharge to a publicly or privately owned treatment works

Evaporated during a cleaning operation

Other, explain:

CBI? **E3-4.** Are *residues* or other solid by-products generated from the cleaning operation?

Yes

Yes (Continue)

No (Skip to next Questionnaire Part)

CBI? **E3-5.** If residues are generated, indicate if they are considered always hazardous, sometimes hazardous, or non-hazardous waste.

Yes

Always hazardous (Continue)

Sometimes hazardous (Continue)

Always non-hazardous (Skip to Question E3-7)

Unknown (Skip to Question E3-7)

CBI? **E3-6.** Indicate what characteristic(s) make the waste hazardous.

Yes

[Redacted area]

CBI? **E3-7.** Indicate how the plant handles the residue or other solid by-products and provide the tons per cleaning event for each type of storage handling technique. If the solid by-products are stored in a *landfill* or *pond/impoundment*, indicate whether the solid by-products are stored permanently or temporarily. [Check all boxes that apply.]

Yes

Landfilled

Stored permanently [Redacted] tons per cleaning event

Stored temporarily (later hauled off-site) [Redacted] tons per cleaning event

Sent to a pond/impoundment

Stored permanently [Redacted] tons per cleaning event

Stored temporarily (later hauled off-site) [Redacted] tons per cleaning event

Hauled off-site for disposal [Redacted] tons per cleaning event

Other (specify): [Redacted] [Redacted] tons per cleaning event

CBI?

Yes

E3-8. If the plant stores the residues or other solid by-products from cleaning operations in a landfill or pond/impoundment, are they combined with other solid by-products generated at the plant? If yes, indicate which. [Check all boxes that apply.]

Yes

Fly ash

Bottom ash

FGD solids

Mill rejects

Other:



No (residues/solid by-products transferred to landfill but not combined with other wastes)

NA (residues/solid by-products not transferred to landfill or pond/impoundment)

CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	

Part E Drop Downs

Process Equipment Cleaning Chemical
Process Equipment Cleaning Chemical
Select
A-120 Inhibitor
A-300 Inhibitor
Ammoniated EDTA
Ammonium Bicarbonate
Ammonium Bifluoride
Ammonium Hydroxide
Ammonium Persulfate
Anti Foam
Aqua Ammonia
Bromate
Citric Acid
F082 Surfactant
F085 Foam agent
Formic Acid
Hydrazine
Hydrochloric Acid
Hydrogen Peroxide
Hydroxyacetic Acid
Nitrogen
Oxygen
Phosphate - DSP disodium
Phosphate - TSP Trisodium
Phosphoric Acid
Rodine 213
Rodine 214
Rodine 31A
Sodium Bromate
Sodium Hydroxide
Sodium Nitrite
Sodium Sulfite
Sulfuric Acid
Thiourea
Other

Type of Water
Type of Water
Select
Potable (city) water
Raw plant intake water
Steam
Treated plant intake water
Other