OPERATION AND MAINTENANCE FOR PARTICULATE CONTROL

I. E.U. 001, UNIT NO. 1

A. Process System Performance Parameters:

1. Design fuel consumption rate at maximum continuous rating: 183.5 tons fuel/hour at 11,126 Btu/lb
2. Operating pressure: 2,600 psi
3. Operating temperature: 1,000 °F
4. Maximum design steam capacity: 3,119,000 lbs/hr

B. Particulate Control Equipment Data:

1. Control equipment designator: electrostatic precipitator
2. Electrostatic precipitator manufacturer: Joy Western
3. Design flow rate: 1,408,000 ACFM
4. Primary voltage: 400 volts
5. Primary current: 245 amps
6. Secondary voltage: 55 kilovolts
7. Secondary current: 1,250 milliamps
8. Design efficiency: 99.7 percent
9. Pressure drop: < 1.0 inches H_2O (average)
10. Rapper frequency: 1/1.5 min. – ¼.0 min. (average)
11. Rapper duration: impact
12. Gas temperature: 330± 55°F (average)

OPERATION AND MAINTENANCE FOR PARTICULATE CONTROL

II. E.U. 002, UNIT NO. 2

A. Process System Performance Parameters:

1. Design fuel consumption rate at maximum continuous rating: 183.5 tons fuel/hour at 11,126 Btu/lb
2. Operating pressure: 2,600 psi
3. Operating temperature: 1,000 °F
4. Maximum design steam capacity: 3,119,000 lbs/hr

B. Particulate Control Equipment Data:

1. Control equipment designator: electrostatic precipitator
2. Electrostatic precipitator manufacturer: Joy Western
3. Design flow rate: 1,312,000 ACFM
4. Primary voltage: 400 volts
5. Primary current: 257 amps
6. Secondary voltage: 45 kilovolts
7. Secondary current: 1,600 milliamps
8. Design efficiency: 99.7 percent
9. Pressure drop: < 1.0 inches H_2O (average)
10. Rapper frequency: 1/1.5 min. – ¼.0 min. (average)
11. Rapper duration: impact
12. Gas temperature: 330± 55°F (average)

OPERATION AND MAINTENANCE FOR PARTICULATE CONTROL

III. E.U. 003, UNIT NO. 3

A. Process System Performance Parameters:

1. Design fuel consumption rate at maximum continuous rating: 190.3 tons fuel/hour at 10,810 Btu/lb
2. Operating pressure: 2,600 psi
3. Operating temperature: 1,000 °F
4. Maximum design steam capacity: 3,115,600 lbs/hr

B. Particulate Control Equipment Data:

1. Control equipment designator: electrostatic precipitator
2. Electrostatic precipitator manufacturer: Joy Western
3. Design flow rate: 1,420,000 ACFM
4. Primary voltage: 400 volts
5. Primary current: 241 amps
6. Secondary voltage: 45 kilovolts
7. Secondary current: 1,500 milliamps
8. Design efficiency: 99.7 percent
9. Pressure drop: < 1.0 inches H_2O (average)
10. Rapper frequency: 1/1.5 min. – ¼.0 min. (average)
11. Rapper duration: impact
12. Gas temperature: 291± 55°F (average)

OPERATION AND MAINTENANCE FOR PARTICULATE CONTROL

IV. E.U. 004, UNIT NO. 4

A. Process System Performance Parameters:

1. Design fuel consumption rate at maximum continuous rating: 206.5 tons fuel/hour at 10,495 Btu/lb
2. Operating pressure: 2,600 psi
3. Operating temperature: 1,005 °F
4. Maximum design steam capacity: 3,300,000 lbs/hr

B. Particulate Control Equipment Data:

1. Control equipment designator: electrostatic precipitator
2. Electrostatic precipitator manufacturer: Belco
3. Design flow rate: 2,200,000 ACFM
4. Primary voltage: 480 volts
5. Primary current: 193 amps
6. Secondary voltage: 45 kilovolts
7. Secondary current: 1,200 milliamps
8. Design efficiency: 99.7 percent
9. Pressure drop: < 0.5 inches H_2O (average)
10. Rapper frequency: 60 sec. (average)
11. Rapper duration: cast steel hammer
12. Gas temperature: 340°F (average)

OPERATION AND MAINTENANCE FOR PARTICULATE CONTROL

V. E.U. 001 - 004, UNIT NOS. 1 – 4

A. Operating Requirements Summary

Operating activities are the activities that are conducted every day or on a weekly basis to ensure continuous, optimum ESP performance. These activities are identified in Table N-1 below. Table N-2 identifies data that are to be recorded on a regular basis.

Table N-1. Summary of Operating Practices for Each Unit

Daily Activities

1.	Check TR set power levels once per day.
2.	Check function of ash removal system.
3.	Check Hopper Level Indication.
4.	Verify proper MIGI rapper operating control fault indicator.
5.	Inspect/service motors
6.	Inspect feed gates
7.	Daily ESP controls check

Table N-2. Operational Data to be Recorded on a Regular Basis

Item Recorded	Frequency
Full Load Steady State Operating Points	Daily
Condition of Rapping Equipment	Daily/Outage
Ash Hopper Operational Problems	Daily/Fuel Sys. Out.
Operational Voltage vs. Current Curves (As Allowable)	Monthly
Transformer Dielectric Fluid Level, Temp. and Pressure	Maj. Outage
Calibration Values for Power Supply Meters	Fuel Sys. Out.
Coal Consumption Rate	W/Elect. Op.
Hopper Level Indicator Operation	Maj. Outage

B. Maintenance Requirement Summary

The activities listed in this section are to take place at intervals that are greater than one week. Table N-3 identifies these activities.

OPERATION AND MAINTENANCE FOR PARTICULATE CONTROL

Table N-3. Summary of Maintenance Practices

Monthly Requirements

1.	Check insulator compartment fans.
2.	Change air filters in sir purge systems.
3.	Verify operation of rapping system.
4.	Inspect/repair ash removal system
5.	Inspect, clean & calibrate pressure transducers
6.	Service transformer-rectifiers/linear reactors

Fuel System Outage Requirements

1.	Inspect discharge electrodes
2.	Inspect collecting electrodes
3.	Inspect ductwork and expansion joints
4.	Inspect casings and hoppers
5.	Inspect/service motors.
6.	Inspect & service rappers & vibrators
7.	Inspect/service high voltage components.
8.	Service key interlock system
9.	Service control equipment & verify calibration of control sensors
10.	Inspect & service auxiliary equipment controls.
11.	Inspect/service insulator compartment heating & ventilation system.
12.	Inspect/repair sliding bearings

Major Outage Requirements

1.	Inspect/align discharge electrodes
2	Inspect/align/repair collecting electrodes
3.	Inspect/service/repair ductwork & expansion joints
4.	Inspect/service/repair casing, hoppers & gate valve assemblies
5.	Inspect/service/calibrate hopper level indicators
6.	Inspect/repair thermal insulation & lagging
7.	Inspect/verify operation of grounding system
8.	Evaluate/test dielectric strength of transformer fluid
9.	Inspect/service/test transformer/rectifier sets
10.	Inspect/replace seals & gaskets on access doors
11.	Inspect/straighten/repair/replace electrode supports
12.	Inspect/repair sliding bearings

OPERATION AND MAINTENANCE FOR PARTICULATE CONTROL

In addition to the data identified in Table N-3 that are recorded on a regular basis, the following information gathered during inspections is also recorded in the ESP log.

Table N-4. Inspection Records

1.	Electrical grounds with location – each occurrence
2.	Discharge electrode failures with location – each occurrence
3.	Ash accumulations on discharge and collecting electrodes with location – each inspection
4.	Ash accumulation on gas distribution devices with location – each inspection
5.	Hopper pluggage with location – each occurrence
6.	Insulator cleanliness – each inspection
7.	Insulator failures with location – each occurrence
8.	Degree of misalignment with location – each inspection
9.	Rapping system problems with location – each occurrence
10.	Corrosion problems with location – each occurrence
11.	Miscellaneous component failures with location and type – each occurrence