

TECHNICAL SPECIFICATION FOR SPARE PARTS SUPPLY AND SERVICES OF ESP ON UNIT 6

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Actual specification includes **6** pages

1 OBJECTIVE

This specification includes the minimal requirements for the supply of spare parts and services for the Electrostatic precipitator (ESP) on Unit 6 of the Šoštanj thermal power plant.

2 BACKGROUND

The ESP type FPA 4x48M-2x124-160-A2, used for cleaning of flue gases from fossil fuel boilers, is designed for highest performance with a low energy consumption and low maintenance costs.

The purpose of the electrostatic precipitator is to remove solid particles (fly ash) contained in the flue gases from the lignite-fired boiler. Flue gases from the boiler are drawn through the precipitators by fans. In the electrostatic precipitators the dust particles become electrically charged by a high voltage system and attracted to collecting electrodes, by means of which they are separated from the flue gases. The purified flue gases are then emitted through the stack. The separated dust particles are dislodged from the collecting electrodes and the discharge electrodes by tumbling hammer systems and fall down into the bottom hoppers. On top of the ESP there are also insulator chambers for the support insulators to the high voltage frame, which is isolated from the grounded collecting system.

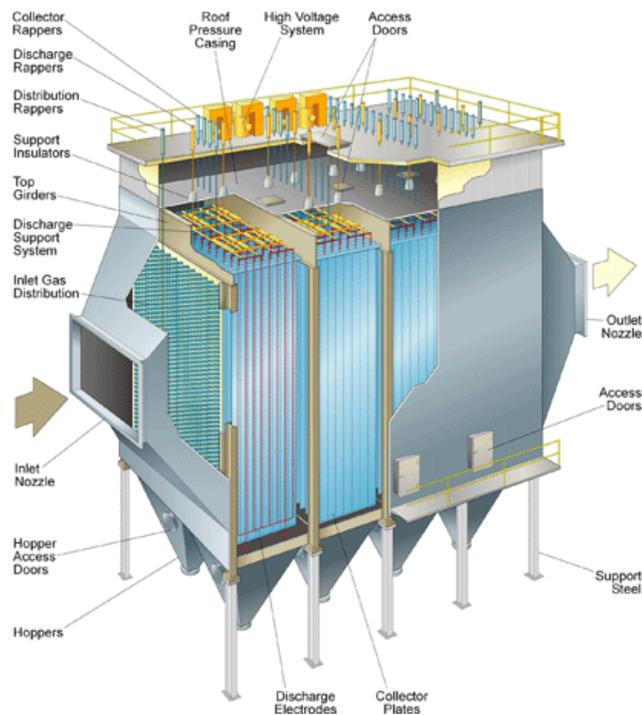


Figure 1: ESP type FPA 4x48M-2x124-160-A2

To warrant the safety and operational capability of the plant revision is required. The purpose of the revision is to satisfy:

- The requirements for efficient purification set forth by the authorities.
- The company's demand for industrial economics and high availability.

The tender comprises two separate lots:

LOT 1: Spare parts for ESP.

LOT 2: Service for revision.

3 SCOPE OF SUPPLY

Spare parts for ESP (LOT 1)

- Inner arm for rapping mechanism drawing nr. V3100490 (20 pcs)
- Outer arm for rapping mechanism drawing nr. V3100500-2700 (20 pcs)
- Outer arm for rapping mechanism drawing nr. V3100500-2600 (20 pcs)
- Outer arm for rapping mechanism drawing nr. 71p00109-1025-MEFAB-0002 (5 pcs)
- Slide bearings drawing nr. V360150 (20 pcs)
- Gas distribution screens for inlet funnel drawings:
 - 71P0109-1008-MEFAB-0002 (1 pc)
 - 71P0109-1008-MEFAB-0003 (1 pc)
 - 71P0109-1008-MEFAB-0005 (1 pc)
 - 71P0109-1008-MEFAB-0006 (1 pc)
 - 71P0109-1008-MEFAB-00012 (1 pc)
 - 71P0109-1008-MEFAB-00013 (1 pc)

(the exact scope will be defined on inspection)

- Teflon gaskets for support insulators for discharge electrode frames (20 pcs)

4 SCOPE OF SERVICES

Service for inspection (LOT 2)

The contractor must provide the personnel with a supervisor to perform all services described below. The exact scope of the inspection will be defined after the inspection of the contractor's service engineer. Inspection must be performed during an outage before the overhaul of the unit 6 in 2021.

a) Housing and hoppers (approx. 700 working hours)

- Repair/replace damaged covers, doors and frames. Replace sealings as required.
- Repair/replace damaged walls and roof of the precipitator. Verify that the heating elements are in working order.
- Repair/replace damaged components that may leak heat, and surfaces that are not continually exposed to the flow of gas, for example inner corners and brackets for inlet and outlet funnels.
- All damaged gas screens in hoppers must be repaired or replaced. Leakages must be repaired.

b) Rapping mechanism (approx. 1200 working hours)

- Change the oil in the gear motors.
- Inspect the rapping shaft guides for play. Repair or replace damaged parts.
- The tumbling hammers: Ensure that the hammers can move freely. Also check the hammers for wear. Replace damaged parts.
- Check the impact rods and their anvils for wear. Replace as required.
- Ensure that the insulation shafts of the rapping mechanism of the discharge systems are free from dust and cracks. Clean and replace insulation shaft as required.

c) Gas distribution screens (approx. 700 working hours)

- Check the screens for unusual accumulation of dust. All damaged screens must be replaced.

d) Discharge electrodes (approx. 700 working hours)

- Check discharge electrodes and framework for unusual accumulation of dust.
- Ensure that the framework attachments to the impact beam are intact. Repair (weld) as required.

- Check the discharge electrodes for mechanical damage, deformation and tension (should not be below 6 kg/spiral).

e) Collecting electrodes (approx. 600 working hours)

- Check the collecting electrodes and suspension irons for unusual accumulation of dust. Clean as required.
- Check the collecting electrodes and suspension irons for mechanical damage and deformation. The distance between the rows should be 400 mm \pm 10 mm. Repair and straighten as required.

f) Insulators (approx. 600 working hours)

Clean the support insulators inside and outside. Also clean the insulation shafts of the discharge rapping mechanisms.

- Check the compartments for dust and moisture. Wipe and clean as required.
- Check the support insulators for cracks. Replace insulators as required.
- Check the lead-through insulators for cracks. Replace as required.

5 PROVIDER REFERENCES

The client requires two inspections of ESP in the last three (3) years. Each reference must be verified by the provider's client.

6 WARRANTY

In the case of deviation from guaranteed performance, poor quality and application of inadequate material, the manufacturer or distributor must immediately take appropriate action to remedy the deficiencies or deliver adequate new part of the relevant material (within 2 months). The cost of correcting shortcomings shall be borne by the manufacturer or distributor.

All assembled parts must ensure designed operation of the ESP according to the original operation and maintenance manual.

For the parts which will be replaced during the warranty period the new warranty period has to be at least 36 months after the original equipment delivery date.

7 ATTACHMENTS

- ESP drawings