



## COMPLETE ESP REBUILD (CONVERSION FROM EUROPEAN “BOTTOM RAPPED” TO AMERICAN “TOP RAPPED” DESIGN)

FOR A MAJOR OHIO UTILITY  
PECO CASE HISTORY



### Plant Data:

Company: Major Ohio Utility  
Unit: 650 MW Unit

Additional Data: Precipitator Unit #8 is comprised of 2 separate casings (8-1 & 8-2) set in parallel. The boiler is operating on low sulfur coal. Flow is approximately 2,070,000 ACFM through the precipitator casings.

O.E.M.: Pollution Control - Walther

### Scope of Supply:

PECO was responsible for the design, manufacturing, and delivery of the precipitator components. PECO's design responsibilities included performing a structural analysis of the precipitator.

- 756 Collecting Plates
- 4,752 Rigid Discharge Electrodes
- 480 Electromagnetic Impact Rappers
- 48 Upper & Lower High Voltage Frames
- 96 High Voltage T-Hanger and Insulator Assemblies
- 24 Inline Disconnect Switches
- Entire Hot Roof
- Entire Cold Roof
- Penthouse Walls
- Variable Porosity Perforated Plates

### Existing ESP Arrangement:

- 2 ESP's on the Approximate 600 MW Unit
- (3) - 15' Mechanical Electrical Fields
- 2 Chambers per ESP
- No access above collecting plates
- High Voltage frames located at inlet & outlet of each plate field
- Tumbling Hammers for cleaning ESP components
- Bed frame with wire discharge electrode design
- Poor gas flow distribution
- Difficult to maintain due to limited access to components.

### PECO ESP Retrofit Arrangement:

- (6) – 9' Mechanical Fields
- (12) – 4 ½' Electrical Fields
- 2 Chambers per ESP
- Additional 5' access added above collecting plates
- High Voltage frames located above and below collecting plates.
- Gravity Impact Rappers mounted on top.
- New internal walkways for access to components.
- Penthouse addition houses high voltage support equipment.
- Rigid Discharge Electrodes eliminate wire failures.
- 9' x 50' Collecting Plates increase collecting area.
- Turning vanes and Variable Porosity Perforated Plate added for even distribution of gas flow per CFD Modeling.
- Additional T/R Sets for improved sectionalizing.

### Result:

PECO successfully performed the retrofit of a PC Walther Electrostatic Precipitator to a standard American Design top rapped Electrostatic Precipitator. In addition to exceeding the performance guarantee of 12% opacity and 0.06 lb. / mmBTU, PECO improved the reliability and performance, and increased the collection area of the unit without affecting the footprint, all while reusing the existing ESP shell, hoppers, and structure. All engineering and material were supplied within the allotted 24 week timeframe. Following a successful startup and operation, the unit presently continues to operate in single digit opacity with minimal maintenance requirements.



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