

Electrostatic Precipitator

ESP System Retrofits and Upgrades

Enhance ESP Performance and Efficiency

The rehabilitation of existing Electrostatic Precipitators (ESP) is a cost-effective means of improving the performance and restoring efficiency of aging equipment as well as achieving compliance in meeting particulate emission levels.

Retrofits to ESP systems have several benefits:

- Minimizes capital expenditures
- Eliminates risks from new equipment start up
- Simpler integration into the balance of plant
- Decreases equipment downtime by keeping outage requirements as short as possible

Fuel Tech Experience

Fuel Tech's team of air pollution control professionals have more than twenty years of experience and technical expertise on both industrial and utility ESP applications. These experts can assist in operational audits/inspections of existing ESPs as well as specification development, equipment recommendations/supply, and construction services.

The strength of the team is the ability to evaluate existing ESP configurations, starting with analysis of the operating and historical data. After gathering the applicable process information, numerical performance modeling is used to evaluate different equipment scenarios to determine the ideal configuration.

The result is a detailed, comprehensive retrofit plan that accounts for environmental and operational goals. The plan will include process and mechanical improvements that contribute to operational efficiency, minimizing installation costs, and overall reliability.



ESP System retrofits improve efficiency, performance, and equipment longevity

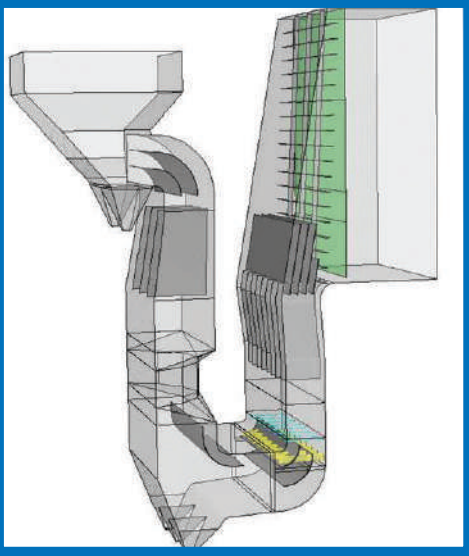
Experience & Capabilities

- Turnkey retrofits and rebuilds
- Project specification and development
- Engineering studies
- Numerical Performance Modeling
- Project Management
- Construction Services
- Precipitator inspections
- More than 35,000 MW of experience

In addition to precipitator internals, projects may include integration of auxiliary equipment such as rappers, controls, ductwork, expansion joints, and structural steel



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As an established single-source supplier, Fuel Tech combines the best equipment concepts to develop an ESP system that is both cost effective and reliable.

The designed system generally matches the physical layout of the existing ESP shell. In most cases, the original equipment can be enhanced with improved mechanical and electrical systems, including:

- Collecting plates
- Discharge electrodes
- Electrical sectionalization
- Power supplies and controls
- Rapping systems

Unique ESP Capabilities and Approach

Additionally, configurations utilizing wide plate spacing (12"-16") with rigid discharge electrodes (RDE) have been very successful in both partial and complete retrofits. The addition of a flue gas conditioning (FGC) system may also be considered to further improve ESP performance guarantees in the case of high flyash resistivity.

Expertise in physical and computational fluid dynamic (CFD) modeling capabilities complement Fuel Tech's proprietary, numerical based ESP performance modeling, which is the basis for determining performance guarantees. This includes ESPs where DSI systems for SO₂, HCl or mercury control may require improved performance or where low-rank fuels create particulate emissions challenges.



ESP Upgrades

- Plate replacement
- Retrofit wires with Rigid Discharge Electrodes (RDE)
- Improved Power and Sectionalization of HV Systems
- Improved rapping systems
- Hot-to-Cold ESP conversion design
- Improved flow distribution
- Guaranteed performance

ESP Retrofits

- Components custom designed to fit each application
- Custom components are installed in all OEM designs
- Guaranteed performance
- Typical retrofit includes wide plate spacing with assembled panel plates and rigid discharge electrodes
- Retrofits successfully performed on both hot-side and cold-side ESPs