

Power Plant Duct Support Analysis and Structural Reinforcement

Description

Industry: Energy & Power | **Service:** Structural & Mechanical Engineering

The Challenge

A power plant was planning to address substantial wear in its exhaust system flue ducts by lining them with new protective liner plates. Before proceeding, the plant needed to understand the structural impact of the added liner weight on the existing support steel and to design reinforcement that would negate any overstress conditions identified.

Two specific challenges had to be resolved:

1. Determine the stress impact on existing support steel after the flue ducts are reinforced with new liner plates.
2. Design reinforcement to effectively negate the impact of the added liner weight.

The Solution

DSE identified the loads of the existing flue ducts and calculated the added weight of the proposed liner plates. The load path to the building's main columns was traced, and all structural members along that path were systematically analyzed.

For each affected beam, DSE determined an acceptable increase in bending stress attributable to the added load. Where the added stress exceeded acceptable limits, DSE determined the extent and locations of reinforcement needed to increase each beam's moment capacity effectively restoring the structural margin that the liner weight would otherwise consume.

Reinforcement schemes were developed for every affected member and successfully implemented without interfering with existing walkways, pipe hangers, or other supported utilities.

Result

The liner plate installation proceeded on schedule with full structural confidence. The plant's flue duct exhaust system was protected against further wear while the structural integrity of the existing support steel was maintained within allowable limits.

Contact DSE to discuss structural analysis and reinforcement engineering for your facility.

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Author

marcdossantos

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