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Nooter/Eriksen
Aftermarket Services

LP Economizer Alterations
November 2009 – Massachusetts

A power producer with a **Nooter/ Eriksen** HRSG which had been operating for over 10 years had experienced unacceptable backpressure levels in their unit over the past few years. The backpressure increase was caused by fouling of the finned tubes, primarily in the LP Economizer coils in the "cold" end of the HRSG. These coils in some operating cases fall below the dew point temperature of certain compounds that condense out of the exhaust gas. The fouling in this case had been found to primarily consist of ammonia bisulfate, formed when the sulfur in the exhaust is converted by the CO catalyst to SO3 and combines with excess ammonia from the SCR system. Compounding this problem was the plant's change from their original design for base-load operation to frequent cycling and partial load cases where the LP Economizer coils operate more frequently below the acid dew point. Cleaning of the coils was only marginally effective due to tight coil spacing driven by original EPC design specifications.

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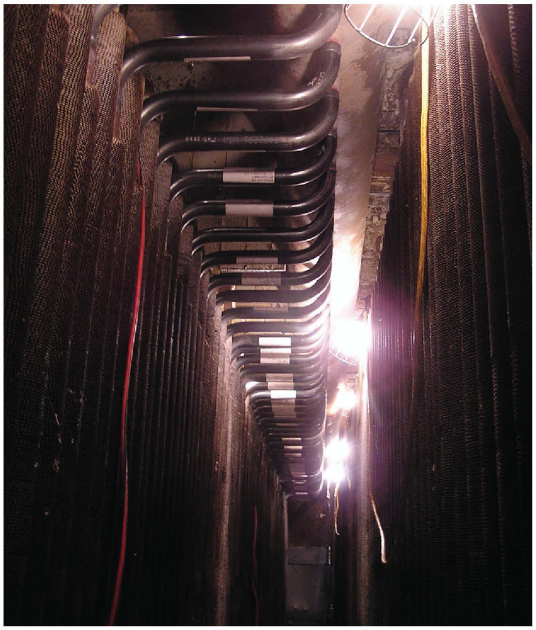

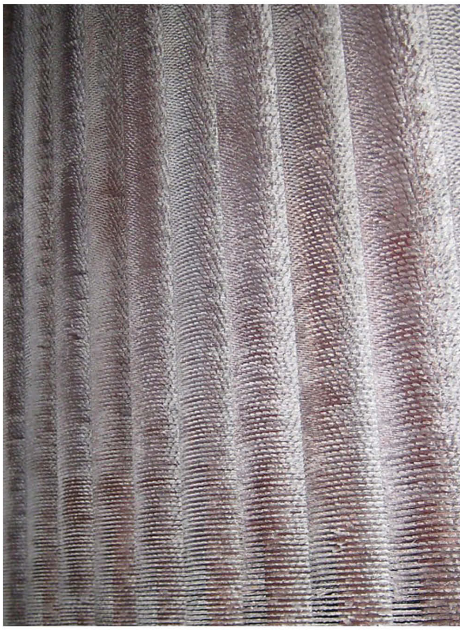

Nooter/Eriksen had previously assisted the plant with the backpressure issues by evaluating and modifying the HRSG casing for a higher allowable backpressure. As backpressure continued to rise, it reached a point where the gas turbine could not reach base-load operation in the cold winter months. A unique solution was proposed to remove four tube rows from the LP Economizer to immediately reduce backpressure and also create a new cleaning lane to further reduce backpressure utilizing CO2 blasting.

Nooter/Eriksen assisted with this project by determining expected HRSG performance after the alteration. This was done with an engineering study that first collected site data to determine current HRSG performance. The current HRSG performance with the fouling was compared to **Nooter/Eriksen's** original thermal design and the performance model was adjusted accordingly. The alteration was found to have minimal effect on overall HRSG performance and the minor loss of steam was acceptable to the plant given the expected increase in gas turbine performance. **Nooter/Eriksen** further assisted with the engineering for the ASME calculations for the alteration and also provided a detailed procedure for the field work to meet a short outage window. A Field Technical Advisor was present during the work and the alteration was successfully performed in November of 2010. The backpressure decreased as predicted.

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