

Engineering of Flue Gas Duct

Project Details

Project	Presbyterian Hospital
Client	Energistics LCC (CA, USA)
Built	New York City, NY
Year	2006

Presbyterian Hospital on Manhattan NYC, NY needed more power and a new gas-turbine and HRSG-boiler should be installed. The exciting boiler installation including flue gas ducts and stack made of bricks was installed/built in 1932. The flue gas from the new gas-turbine/HRSG boiler should go through the exciting stack and the goal was to have as low back pressure for the gas-turbine as possible.

The exciting ductwork consisted of a header duct prepared for inlet of 5 industrial boilers. Only 4 of the 5 inlets were in use.

PlantWare made site inspection of the exciting installation to find the best routing for the new duct and how it should be attached to the exciting header. Afterward CFD modelling and calculations was performed in over to determine what internal guide vanes and other modifications was needed.

Several different configurations was tested. However, reducing the back pressure was not possible and furthermore, Presbyterian Hospital would not allow the plant to be shut down for modifications.

The conclusion based on CFD calculations was, that is was not possible to reduce the back pressure for the new gas turbine to an acceptable level with the given geometry and demand for up-time. A new flue gas duct was routed from the gas-turbine/HRSG boiler above the roof and directly into the exciting stack.

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