

Modular Exhaust Silencer Replacement for UK CHP Plant

AAF International has been supplying acoustic solutions across the world for over 30 years and is a global leader in gas turbine air filtration and exhaust acoustic systems.

We operate in the oil and gas and power generation industries.

Our OEM Division supply systems to all the leading gas turbine manufacturers whilst our Aftermarket Division carry out system repairs and upgrades throughout the world.

From this business we have established our Manufacturing Services Group where we design and manufacture high quality systems in our own state of the art fabrication and manufacturing facilities.

- BSI ISO 9001 Quality Assurance
- BS EN ISO 14001 Environmental Management System
- BS OHSAS 18001 Occupational Health & Safety Management System



Scope

A UK CHP Operator deemed after periodic inspection had highlighted the requirement that the silencer installed in a gas turbine exhaust duct on a CHP installation needed replacement. The silencer had been installed for over nine years during which time it had been subjected to continuous exposure to hot exhaust gas at temperatures up to 550°C and velocities up to 46m/s from a large GE Frame 6 Combustion Gas Turbine MS6001B. The silencer was unavoidably located within a lined exhaust duct approximately 3 metres from the exhaust volute and was exposed to the full force of the hot turbulent exhaust gas.

It had begun to show signs of deterioration due to constant cyclic material fatigue. This had been caused by the need to continuously modulate the flow of exhaust gases between two waste heat recovery boilers and a bypass stack.

The plant is relied upon to supply both steam and electrical power to an adjacent continuous operation manufacturing plant, where interruption in supply would result in serious financial losses. Surplus power is supplied to the Grid, meaning further loss of revenue to the plant owner should there be an interruption in supply.

Solution

As a recognised market leader of retrofit solutions in gas turbine hot gas exhaust systems, AAF was approached to quote for the design and installation of a new silencer. Taking into account the extreme conditions under which the silencer was expected to operate, AAF designed and quoted for a design of silencer which had been previously developed for high velocity exhaust systems.

The new equipment incorporates several key design modifications which will enable the silencer to perform under the arduous conditions as previously described. These include laminar air flow, reduced silencer length and reduced pressure loss resulting in increased efficiency and power output.

This proposal was accepted by the client and AAF was commissioned to design, manufacture and install the new silencer.

After signing of contracts, the new silencer was built in one of our own manufacturing facilities from where it was shipped to site in modular form and delivered on time.

Supplying the new silencer in modular form allowed the installation to be performed utilising a small access hatch on the top of the silencer duct, assembling the unit inside the duct. This caused minimum disruption to the plant and allowed work to be carried out alongside major outage works that were being undertaken on the gas turbine itself. The destruction of the old unit and installation of the new one was carried out within a planned 3 week outage.

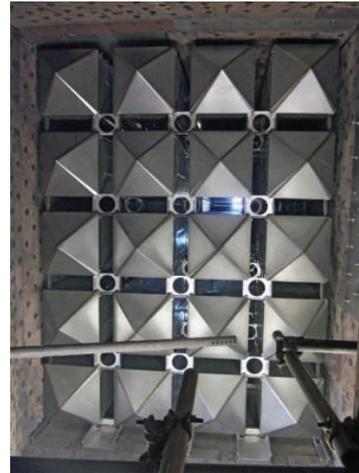
The work was undertaken by AAF Site Services working round the clock to ensure that it was completed 3 days ahead of schedule and within budget.

The Successful Outcome

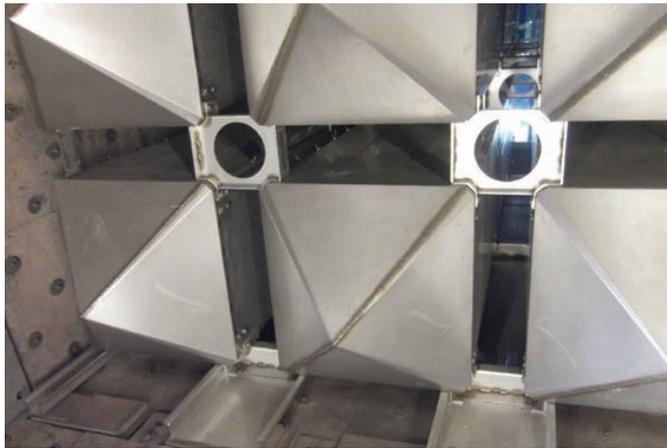
Following re commissioning of the plant the client reports that all the design parameters of the unit are being met in regard to acoustic performance and system pressure loss etc, with improved gas turbine performance. The client can confidently expect the silencer to perform for many years with no loss of revenue thanks to the unique AAF design.

AAF the solutions provider for Gas Turbine auxiliary equipment repair, refurbishment, upgrade, retrofit and noise abatement solutions to meet your assets specific requirements:

Air Intake Filtration Systems / Intake Systems / Hot Gas Exhaust Systems / Waste Heat Recovery Units (WHRU) / GT and AC Generator Acoustic Enclosures / Ventilation Systems / Taylor Made Acoustic Screens, Barriers, and Enclosures for Noise Suppression.



View on front of new silencer



Enlarged view of new silencer

Quality, expertise and innovation

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