



ENVIRONMENTAL TECHNOLOGY

## Full steam ahead for refinery after change to STS seals

An oil and gas refinery in northern England was experiencing poor reliability of its steam turbine resulting from the failure of its existing seal system.

The company was employing segmented carbon bushes as a sealing device on its steam turbines, but their tendency to wear out over time led to an excessive leakage of steam. The increasing steam leakage and the waste of energy resulting from the loss of steam is now costing the company around £90 a metric tonne.

In addition, the steam was leaking into the turbine bearing housing, further reducing the life of the bearing seal, and causing health and safety concerns because of the danger from the high-pressure steam.

To remedy the situation, AESSEAL® recommended the use of its STS™ mechanical seal and LabTecta® IP66 Steam Turbine bearing protector. The STS™ seal has been developed specifically to replace the carbon ring seals normally fitted to steam turbines. The STS™ seals were installed in August 2016 and operated without failure until they were swapped out as part of a general maintenance programme over five and a half years later in March 2022...



## ‘Saving over £1 Million (\$1.2M) each year’

Industry:	Oil & Gas
Product:	STS™ and LabTecta®66ST
Application:	Steam Turbines
CO2e Savings:	1200 tonnes
Savings:	>£1 Million / \$1.2 Million per year
Reference N.O:	TD3081032



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Steam leakages rates for new segmented carbon bushings were estimated to be 16kg (35lbs) an hour. During operation these bushings wear and leakage progressively increases. The steam leakage rate for worn carbon bushes approaching the end of their serviceable life exceeds 30kg (65lbs) an hour. Most steam turbines have two seals, the steam savings resulting from the use of one STS™ seal are estimated to be 170 metric tonnes a year.

The result for the client company has been to eliminate the leakage of steam into the turbine bearing housing, extending the life of the turbines from less than five years to more than eight years, and greatly reducing the time and cost of maintenance.

The user has now converted 35 turbines (70 AESSEAL® STS™ installed) and resulting in a total saving of over £1 million per year.

The process of generation steam involves the combustion of fossil fuels thus avoiding steam losses impacts a refineries scope 1 or 2 GHG emissions. The upgraded fleet of steam turbines have prevented an estimated 1200 tonnes CO2e emissions from the refinery.



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