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Online Compressor Washing for Gas Turbine Power Output

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Abstract : The privatization of utilities has brought about very strong competition in industries such as petrochemical and gas distribution among others, considering the continuous increase in cost of fuel. This has brought about the intense reason for gas turbine owners and operators to reduce and control performance degradation of the engine in other to minimize cost. The most common and very crucial problem of the gas turbine is the fouling of compressor, which is mostly caused by a reduction in flow capacity, compressor efficiency, and pressure ratio, this, in turn, lead to the engine compressor re-matching and output power and thermal efficiency reduction. The content of this paper encompasses a detailed presentation of the major causes, effects and control mechanism of fouling. The major emphasis is on compressor water washing to enable power augmentation. A modelled gas turbine similar to that of GE LM6000 is modelled for the current study, based on TURBOMATCH which is a Cranfield University software specifically made for gas turbine performance simulation and fouling detection. The compounded and intricate challenges of compressor online water washing of large output gas turbine are carried out. The treatment is applied to axial compressor used in the petrochemical and hydrocarbon industry.

Keywords : gas turbine, fouling, degradation, compressor washing
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