

46ESS-04: Compressor Cleaning Systems for Industrial Gas Turbines

SRIYALLAPA RAJU ALAPATI

Compressor cleaning is required to restore the performance of fouled compressors. Ingression of air borne particles into the gas turbine compressor is unavoidable, despite the highly-sophisticated air filtration systems available today. As a result, fouling of airfoil and air-path surfaces in the gas turbine compressor occur, leading to performance loss and increased fuel consumption. Worldwide industrial field experience has clearly indicated that axial flow compressor deterioration during operation accounts for 70-85% loss of performance from the new and clean condition. Fouling of axial flow compressor blades are caused by adherence of particular contaminants in the sub-micron to 10-micron size range and this will be the major source of fouling. Another possible source of compressor fouling is leakage of oil from the compressor rotor inlet bearing.

Compressor fouling is a recoverable form of degradation, with the help of good compressor cleaning method it is possible to recover power close to the original level. This paper deals with various methods of compressor cleaning techniques, their benefits, drawbacks, historical developments over the recent years, effect of compressor cleaning on gas turbine engine performance and finally, the paper discusses the future developments in compressor cleaning systems for Industrial Gas Turbines.