

## Synopsis

This paper looks at the evolution of gas turbine compressor cleaning, and relates it to the various technical advances in the development of gas turbines. It starts with a reminder of how fouling affects the aerodynamics of the compressor and hence the necessity for compressor washing.

The early days of cleaning compressors with very basic materials and methods are described, as used on the relatively unsophisticated types of gas turbines of the time. Moving on through the 60s and 70s and the introduction of single crystal blades and super-alloys, it goes into the move from hand cleaning to cleaning at crank speeds, and so on to the latest cleaning technology employed today.

The development of wash fluids is also presented, from tap water up to the latest sophisticated blends of chemicals.

Evolving nozzle design and positions in the intake plenum is examined in some detail. Increasing air flows, and developments in compressor blade design, have influenced the importance of droplet formation and hence nozzle design.

Environmental legislation is covered briefly, with its influence on gas turbine development and hence cleaning methods.

The degree of automating wash systems is discussed as the efficiency demands on the industry become greater.

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Qualified as an engineering designer, Russ has worked for many years in the compressor industry. Since 1994 he has worked with R-MC Power recovery, initially in sales for their range of wash fluid injection systems, then moving into the project department and since 2001 as their Technical Manager. Russ also does guest lectures on compressor efficiency and washing at Cranfield University.