

A NON-THERMAL PLASMA APPLICATION FOR THE ROYAL NAVY

Lt. Cdr. D. E. Hughes (CF – Canadian Forces)

U.K. Ministry of Defence

The worldwide travel of the British Royal Navy provides for a varied environment that naval vessels are accustomed and presents numerous challenges. Environmental legislation has become increasingly stringent for the marine industry and navies worldwide. The NO_x and particulate emissions reduction from diesel engines continues to be of importance to the U.K. Ministry of Defence (MOD). Evaluation of the feasibility of exhaust control technologies suitable for NO_x reduction is constantly being monitored. The Accentus plc proprietary and patented non-thermal plasma (NTP) system is presently in stage 2 development with U.K. MOD and is being applied to the naval environment. A stage 1 feasibility and analysis study has been completed, and a 1/10-scale demonstrator is a deliverable for stage 2. NTP compared to selective catalytic reduction (SCR) has the potential to offer significantly improved low load and shock performance over the conventional SCR without the inconvenience of using an ammonia-based reductant.

The primary objective of the paper is to discuss the Accentus NTP system application to a broad range of operational naval diesels and the recent engine trials conducted at MAN B&W. The secondary objective is to discuss U.K. policy and naval environmental strategy and to monitor, evaluate, develop, and advise future capital projects.

The NO_x reduction through primary means is preferred in U.K. MOD vessels. However, the vast array of engine types and imminent emission level change has focused the Royal Navy on secondary treatment such as NTP and SCR. Investment appraisal in secondary fits will increasingly support new technology engine after-treatment retrofit. The uncertain nature of NO_x and particulate level legislation has reinforced the Royal Navy commitment to remaining an informed customer on “green” issues.