Reducing emissions from the aviation sector is recognised as a major challenge for both government and industry. As an aero engine manufacturer, Rolls-Royce is looking to technical innovation in order to achieve a 12% cut in fuel consumption and a 60% reduction in NOx (40% in ANTLE programme), compared with the best available technology in the mid 1990s. Rolls-Royce is also working to meet goals set by ACARE (Advisory Council for Aerospace Research in Europe), which include a halving of current noise levels and an 80 per cent reduction in NOx, by 2020.

This poster describes the functionality and testing of the novel control strategy developed to regulate the staged combustion system of the Affordable Near-Term Low Emissions (ANTLE) demonstrator engine. ANTLE is part of the European Commission funded Efficient and Environmentally Friendly Aero Engine (EEFAE) project, aimed at maintaining European industry's competitive position as a supplier of advanced turbofan engines.

Staged combustion, in which sets of burners are fuelled at different parts of the flight cycle, is one of the technologies being investigated as a means of reducing engine emissions. Effective control of this system, in terms of achieving correct burner activation times and fuel split ratios between active burners is required.

The development of the ANTLE engine software-based control system is described. Initially within a simulation environment, and subsequently via engine testing, in Madrid, Spain during 2005. Results showed that the staged combustion control system was capable of providing the necessary control across the whole power range, including steady state running and engine transients. It was concluded that the control system developed here was effective and is being further developed. The ANTLE engine achieved the 40% NO\textsubscript{x} reduction target.