

Noise from 400 MW Power Station

A detailed acoustic study was required for a proposed 400MW combined cycle gas fired turbine power station near Galway in the west of Ireland. The plant permit condition issued by the Irish Environmental Protection Agency specified noise limits at the nearest receptors. The assessment therefore needed to advise the client on the most cost-effective way of ensuring compliance.

Noise levels were predicted around the plant using a complex computer model. Noise source assumptions were based on 1/3rd octave data, provided by GE Energy and from measurements at similar sites. The computer model considered the complex terrain around the site, including a detailed site survey and contour information from the Ordnance Survey.

The computer model predictions confirmed that the main sources were the condensers, the powerhouse walls and roof, the air intake, fin fan coolers, transformers, the stack exhaust, the HRSG, roller doors and ventilation fans.

A number of detailed computer model iterations were conducted to reduce noise from critical noisy elements.

The dominant noise sources off-site were the condenser fans and the transformers. Simple measures were introduced to the design to reduce noise at the nearest receptors. This helped reduce the predicted noise overall by a factor of 3dBA at little additional cost.

Three different wall and roof panel options were modelled, enabling the design team to select a lighter panel without compromising the overall acoustic performance.

A full model sensitivity analysis was conducted for the project to ensure that the predictions were sufficiently conservative. This included predictions using two different prediction methods (ISO 9613 and CONCAWE) for a wide range of weather conditions and corrections for potential measurement errors.

The assessment also included advice on controlling noise from start up and shut down operations.

