



## Daring Class Type 45 Destroyers

### WR21 Naval Gas Turbine Packaging and Integration

Cullum were approached by Rolls-Royce Naval Marine (RRNM) and requested to provide support with delivery issues they were experiencing with the WR21 Propulsion unit for the Type 45 Destroyer.

Ultimately late delivery would have impacted on BAE systems delivery of the 1st of Class to the Royal Navy.

Cullum Marine undertook to manufacture, integrate and install the Gas Turbine and Alternator package including site working at the Glasgow facility. The project was a complete success, demonstrating the abilities and skills of Cullum Marine.

Cullum Scope Included:

- **Manufacture of the WR21 Gas Turbine Baseplate**
- **Manufacture of the WR21 Gas Turbine Acoustic Enclosure**
- **Manufacture of the Ventilation Housing Enclosure**
- **Manufacture of the Alternator Baseplate**
- **Manufacture of the GTA Package Lifting Equipment**
- **Installation of the Exhaust Collector**
- **Integration of the Fluid Systems and Pipework**
- **Integration of the Electrical Harnesses**
- **Integration of the Fire and Gas Detection System**
- **Integration of the Fire Suppression System**
- **Integration of the Ventilation System**
- **Installation of the Recuperator**
- **Alignment of the WR21 and Alternator Drive Train**
- **Testing and Commissioning**
- **Loading out the Completed GTA Package to the Docks**