

Case Study

# Exotic and Breeder Fuels Programmes, Dounreay Site Restoration Limited

Under Amentum's leadership, the highly prioritised Exotics and Out of Reactor Breeder Fuels Programmes were successfully delivered from the Dounreay Site in Scotland. The task was to transport over 50 tonnes of 'exotic' and 'breeder' fuel material from Dounreay to Sellafield and other domestic and international locations for reprocessing and/or repurposing. This in turn lowered the security level required at the Dounreay site and ultimately advanced the decommissioning and clean-up mission. The Programme was valued at £329 million and was delivered from 2012-2019.

The material was located in purpose-built stores at Dounreay for many decades under full special nuclear material (SNM) security and safeguard controls. The material inventory included highly enriched uranium (HEU) (>20% enrichment) in various forms including oxide, metal, alloy and uranium hexafluoride (UF<sub>6</sub>); as well as plutonium in various forms, including oxide and carbide. The majority of the plutonium and HEU material was stored in cans of various sizes.

The critical material was shipped under full Category 1 security arrangements in Type B flasks using road, sea, rail and air transport, depending on the destination. The Breeder scope included management of the shipment of irradiated out of reactor breeder fuel from Dounreay to Sellafield for reprocessing.

The Programme included:

- The provision and regulatory licensing of multiple Type B flasks, including: Safkeg, ES3100 and M4/12.
- Managing the creation of a first-of-a-kind UK nuclear transport multi-water barrier licence for the M4/12 and unique non insulating 4085A Safkeg.

Under this Programme, Amentum's Programme Director, Andy Beckwith, and Deputy Director Stuart Thornton led an integrated team to deliver these critical government programmes three years ahead of their projected schedule. The team's work was highly successful, and saw:

- No safety or security incidents or any non-compliances recorded against the programme.
- An initial idea and an empty space evolve through design completion, construction, commissioning and processing for the HEU Gloveboxes within just three years.
- Over 1,645 days worked (circa 150,000 person hours) without a lost time injury while moved over 2500 items to multiple locations within the world.
- The workforce increase from 80 to 220 people within four months.

This high-profile programme required significant engagement with the Office for Nuclear Regulation (ONR) regarding nuclear safety, radioactive material transport, civil nuclear security and safeguards. It included internal and external stakeholders such as Scottish Environmental Protection Agency (SEPA) and Euratom, as well as our customer – the NDA, government departments and consignee partners at Sellafield and in internationally, to ensure that DSRL was fully compliant with the consignee facility's conditions for acceptance.

Danny Gregory, representative from Office of Nuclear Regulation (ONR), applauded the Programme's success in the *Annual Review of Safety* in 2017 as, "The programme that was set up to violate every management rule for a successful project – including pressure, un-risk assessed programme, extreme reporting requirements, diversity in organisations, split accountabilities between the site licence companies and the government owned risk. It was a credit to the management team that all this work has been completed safely and within the law."

Our work at Dounreay is a clear display of Amentum's values and expertise – we're passionate about providing the best value solutions for our clients, on time and within budget, every time.

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Image 1: The Dounreay coastline showing extent of the full site.



Image 2: Glovebox facility designed, manufactured, commissioned and operated under the programme.





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