



Marine, Air, Land Fuel Capability Investigation

Conducted in-depth analysis of UK Royal Navy oil fuel depots and associated infrastructure options to assess potential operational impacts. This process identified capital investment savings of £166 million while still delivering the desired capability.

Executive Summary

UK Defence operates six Oil Fuel Depots (OFDs) around the UK in support of warships and naval auxiliaries. The aim of the OFD system is to provide an assured supply of sufficient, suitable fuel to meet the routine and contingent requirements of Defence. The objectives of the OFD system are to receive, store, husband, issue and recover fuel, to the volumes, timelines and quality required by Defence. However the OFDs have been configured and installed over a number of decades to support a range of vessels, vehicles, aircraft and ground fuel use, and may not be optimum for future need.

There were concerns that the volume of bulk marine fuel inventory held by Defence may not be stored in the optimum locations. Therefore QinetiQ were tasked to undertake a Capability Investigation to evaluate the future requirement and options for fuel storage at OFDs in the UK and at the overseas Permanent Joint Operating Bases (PJOBs).

The modelling and analysis made specific recommendations for the configuration of each OFD and allowed the UK Royal Navy to reduce investment whilst achieving the required capability.

The brief

The aim of the Capability Investigation was threefold:

- To evaluate the future UK MOD marine fuel storage requirement, noting standing commitments and contingent operations.
- To recognise the current and future income generation of irreducible spare capacity of the six OFDs in the UK, i.e. OFDs self-financing.
- To understand the requirement for fuel storage at PJOBs.

Our solution

The capability, configuration and status of each OFD, along with current and future maritime, air and land demands, considering standing and contingent operations, was analysed.

To perform the analysis required the development and use of a discrete event simulation of fuel movements. Three different timeframes were used to capture the changes in the Royal Naval Fleet composition over time. A parametric analysis capability was also developed and incorporated into the discrete event simulation tool to allow assessment of multiple scenarios and variables.

The first stage involved the analysis of the 6 OFDs in the UK, and generated recommended configurations for each.

The second stage provided understanding of the requirement for fuel storage at overseas PJOBs. It sought to assess the impact of combined, joint operations on fuel stocks and ascertain the capability required and any associated risks.

The analytical output was informed by extensive engagement with the

OFDs and PJOBs to develop an in-depth understanding of the issues faced with fuel storage and delivery, along with the mitigations available.

Outcome and benefits

The study provided the following outcomes and benefits:

1. Evidence to support anecdotal knowledge.
2. An endorsed current and future maritime fuel demand figure.
3. An understanding of how and why fuel demand evolves over time.
4. An understanding of the interdependencies between fuel supply, demand, transportation and storage across all OFDs and PJOBs.
5. An understanding of current capability along with options for future capability and their associated risks and benefits.

