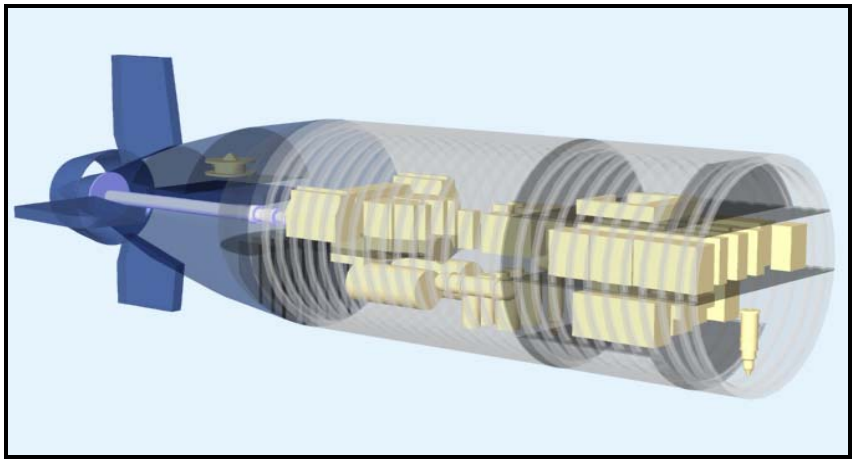
Submarine Secondary Systems - "…cost-benefit analyses to determine the best solutions"

The challenge

To deliver a study reviewing the possible enhancement, simplification and improvement in efficiency and affordability of Submarine Secondary Systems.

Our response

A nuclear submarine's secondary systems provide the power for its propulsion and all the electricity needed to power onboard equipment and sustain life. The Ministry of Defence (MoD), in line with the recently published Defence Industrial Strategy (DIS) considered it prudent to review the design and technology of these systems. BMT Defence Services has undertaken a thorough assessment of existing and new technologies and compared potential capabilities.



Customer benefits

Royal Navy nuclear submarines' secondary systems are already well designed and are reliable, resilient, compact and quiet, but BMT was completely open-minded in the wide-ranging search for improvements.

Our study highlighted that because in the past full-load efficiency was considered vital existing secondary systems are less efficient at part-load. Although it is difficult to design for good efficiency across the full power range of a propulsion system today's nuclear submarines travel mostly at slow speeds with low propulsion loads so improved part-load efficiency can greatly increase the submarine's operational life.

The study also considered the capability of various technologies to improve overall submarine through-life costs by reducing maintenance requirements and improving reliability. It is here that simpler systems can have the greatest impact by reducing procurement cost and maintenance.

Another factor was the best way to distribute electrical power throughout the submarine. With highly reliable power supplies, systems have become simpler as alternative and back-up supplies are no longer needed. In all these areas – including power generation, propulsion and power distribution – there have been significant advances in technology.

Following the completion of the study, BMT will model a number of possible systems and undertake detailed cost-benefit analyses to determine the best solutions.