

# Vigilant: partnering in practice

When conducting any major vessel refit, a close working relationship between all parties is essential. Here, Babcock Submarine Programme Director Gavin Leckie looks at progress to date in the HMS Vigilant refit as a major milestone is achieved, and the role and success of the new partnering approach.



Just over two years into the current Long Overhaul Period (Refuel) (LOP(R)) being carried out by Babcock at Devonport Royal Dockyard on strategic deterrent submarine (SSBN) HMS *Vigilant*, refuelling has been successfully completed, marking a major milestone. The achievement is yet another demonstration of the new approach being taken in this third Vanguard class refit; one that is centred on collaboration and partnering between Babcock and the MOD, to optimise performance.

The five-year LOP(R) project (including the planning phase), due for completion in 2012, represents a complex and challenging programme of work. The refuel with Core H (providing power for the remainder of the submarine's operational life, without the need to refuel) and subsequent reactor commissioning is a key component of this, and dictates the overall programme duration. This is supported by a major revalidation of all reactor systems and replacement of major equipment such as the reactor pressure vessel head, main coolant pumps and reactor instrumentation suite.

The LOP(R) also sees a significant number of upgrades to the submarine's tactical and strategic weapons systems, as well as a vital and substantial overhaul of the propulsion system including main engines, 700kW motor generators, rehabilitation of the tailshaft and changing of the propulsor, plus upgrades to the accommodation and mess areas and major external re-preservation work. Moreover, while this is the third Vanguard class LOP(R) to be undertaken by Babcock, it also includes some 'firsts', including the installation and commissioning of the Combined Oxygen Generation System, and a significant modification to the control rod drive mechanisms.

The project is substantial. More than 2000 personnel (500 being skilled technicians and tradesmen) and 2.2 million manhours are involved. Sixty capability upgrades and 100 class modifications are to be completed, and 26,500 items removed, overhauled and refitted. The 3500 system and structural surveys carried out, 400 systems tested, 166 upgrades completed, 3000 new items being manufactured, 35,000 material items ordered, and 6500 welds completed give a further indication of the scale of this project.

On a project of such substantial scale and significance, close working between the parties involved is vital. To this end, the partnering agreement and supporting commercial arrangement between Babcock and the MOD represents a significant step in the evolution of MOD/industry partnering. In planning for the *Vigilant* LOP(R), Babcock, working with the MOD, has sought to do things differently. The new approach focuses on joint working to a common goal and removing adversarial behaviours (which traditional arrangements have not successfully addressed), while seeing a number of new initiatives and improvements to existing processes introduced, the application of in-depth knowledge and experience to significantly reduce costs, and delivery performance incentivised.

*"The new collaborative approach ensures a joint team focus on delivery, innovation, quality and cost-savings"*

## Partnering in practice

The refuelling of a nuclear submarine – the latest key milestone to be achieved (November 2010) – is an extremely complex and technically demanding procedure, carried out to the most rigorous of safety standards. Indeed Babcock, which has considerable knowledge and experience in this field, is the only company in the country with the facilities and expertise to undertake open core submarine reactor work. The process, from removing the reactor head to access the fuel modules, to replacing the reactor head when refuelling is complete, takes around seven months and involves nearly 100 highly trained and experienced refuellers.

The new collaborative partnering approach being implemented on this LOP(R) has played a valuable role in the successful completion of the

critical refuel programme, and a number of the key tenets of the partnering approach have contributed. For example, drawing on experience, including capturing and integrating lessons learnt from *Vanguard* and *Victorious*, has paid dividends, as have developments such as moves to improve the speed of decision-making to execute changes (with increased technical and financial delegation to facilitate this) and initiation of an innovation and efficiency tracking register (supported with a project reward and recognition scheme). Further, the innovative contractual arrangements built around reward for performance (no longer featuring penalties for late delivery, but incentivising early delivery) have also been seen to drive effective partnering and optimise performance.

During the refuelling programme the new partnering ethos has been very much in evidence in the strong relationships between all parties involved, with all working to a common goal, and open and honest communication very much a feature. Moreover, the improved, swift lines of communication have enabled any problems encountered to be quickly resolved without recourse to a blame culture or strong contractual stance.

In terms of learning from experience, greater emphasis on pre-LOP(R) planning, increased focus on risk management and investment in mitigation have shown specific benefits, as has the incentive and context within which to tackle issues, or potential issues, with new approaches.

One such example lies in the resolution of a potential issue over availability of a built-up RPV head. Late delivery of MOD-supplied long lead time components has in the past resulted in unacceptable delays to programmes. A similar situation was in danger of arising again with the supply of components to support the introduction of the new latching mechanism to the control rod assembly (a modification which further enhances submarine safety at sea and alongside). As risk mitigation, and to ensure availability of the built-up head when required to meet the programme, Babcock and Rolls-Royce (which supplies the RPV head) took on the proactive management of the issue, and have worked together to manage the provision of the components with the MOD, leading ultimately to delivery of the whole assembly in accordance with the LOP(R) requirements.

In short, the change in culture, backed up by the new commercial framework, is delivering the desired results, the successful completion of refuelling being a key example and a major milestone in the programme. Moreover, to ensure that the partnering approach remains on track and becomes fully embedded, a partnering assessment process has been introduced, involving a regular review of performance, measurement on a monthly basis, and annual independent assessment as a form of benchmarking. The HMS *Vigilant* Project Partnering Board, with membership from Babcock, DE&S, Navy Command and Rolls-Royce Marine, and co-chaired by Babcock and DE&S, ensures that these partnering processes are implemented, initiatives communicated, and health checks undertaken.

To summarise, the new collaborative approach ensures a joint team focus on delivery, innovation, quality and cost savings. Two years into the refit and the results of this are being seen, particularly in a change in behaviours as the partnering ethos has been embraced and we share a focus on the common goal; to deliver HMS *Vigilant* to Navy Command to customer satisfaction, on-time, in-budget, and to a specification to meet future safe operations and maximised capability.

HMS *Vigilant*'s LOP(R) will complete in 2012, following sea trials.



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