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Visit to BAE Systems Submarine Solutions

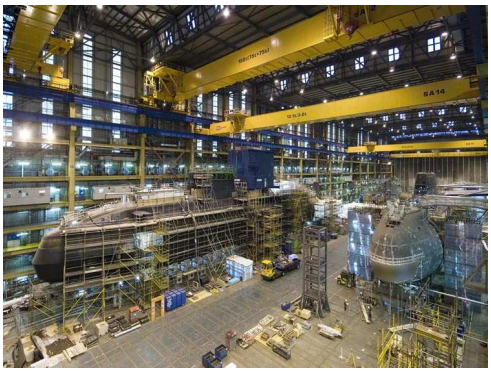
At the first meeting of the 2007 – 2008 season, on 19 September 2007 Rear Admiral Tim Chittenden gave an excellent presentation on the design and building of the Royal Navy's latest hunter-killer submarines, the Astute class. As a follow-up, on 17 March 2008, a lucky few Institution Members and friends had the opportunity to visit the BAE Systems facilities at Barrow-in-Furness to see the construction work in progress.

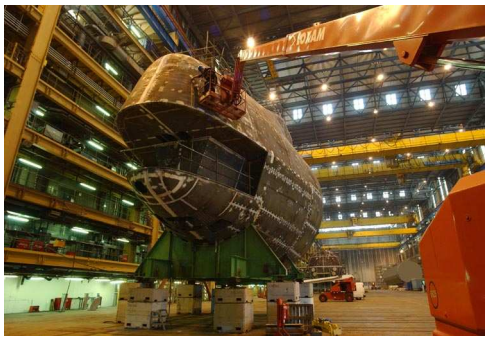
Astute Class at Sea

Astute Class Launch

The visit started with a warm welcome from Brian Benn, who described some of the history of submarine building at Barrow, which goes back over 100 years. He explained that the Astute class incorporates features taken from the Vanguard and the Trafalgar classes. Being nuclear powered, with the reactor fuel designed to last for the lifetime of the boats, underwater endurance is limited only by the amount of food that can be carried on board. Each submarine can make its own air and water to support the crew, and is capable of circumnavigating the globe, unseen and undetected. The Astute class does not carry ballistic missiles like the Vanguard class, but is heavily armed and can fire land attack cruise-type missiles and torpedoes, as well as carrying out a wide range of intelligence-gathering and covert missions.

The group was then given a demonstration of the CAD facilities which have been used to design the Astute, bringing very significant reductions in the time needed to update the design when changes were needed. The latest enhancement of this system is the addition of 3-D stereoscopic imaging, which, with the aid of special glasses, enables the viewer to get an almost frighteningly realistic 3-D view of any of the boat's systems. 3-D viewing cabins have been added on the shop floor to enable the craftsmen actually building the boat to see each feature before having to install it for real.





Astute Class Build

The group then toured the Pipe Shop and the Main Fabrication Shop, and were given a real sense of the scale and complexity of the components and sub-assemblies, and the very unique nature of much of the work. After lunch, the visit culminated with a tour of the Devonshire Dock Hall (DDH), where we were able to see the first four Astute class submarines in various stages. The first of class, Astute, was back in the DDH, having undergone diving and torpedo trials in the dock basin following its ceremonial launch in June 2007. The group was able to see the progress made using new construction methods which utilise prebuilt and tested modules that can be slid into the open end of the hull, and the move to fitting-out some sections of the hull whilst these are in the vertical position, before tilting them through 90 degrees for welding to the adjoining hull section in the standard horizontal orientation.

The group then went on a 'windshield tour' to see the shiplift, capable of transferring submarines up to the size of Vanguard in and out of the dock basin, and the visit finished with a question and answer session.

IMechE West Cumbria Branch is extremely grateful to Tim Chittenden and Brian Benn for arranging the visit, and to the many engineering graduates who acted as guides for the day round the various facilities. All those who were lucky enough to participate learned a great deal and thoroughly enjoyed their visit to a unique national facility which we are delighted to see continuing to thrive as one of the jewels in Cumbria's engineering crown.

For further information on this release, interviews or comments, please contact **Jim Furness**
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