

ASTUTE LAUNCH TO MECHANICALS SEASON

Engineering behind the new Astute class nuclear submarine to be revealed

The new season for events and activities by the Institution of Mechanical Engineers in West Cumbria is to be launched in splendid style by a presentation on the newly-launched Astute nuclear submarine. This is to be held on Wednesday, September 19th, at Hundith Hill Hotel, Cockermouth starting at 7.30pm. The event is open to all interested in innovative world-class engineering.

The presentation will be made by Rear Admiral (Retd) Tim Chittenden, who will describe the project and the facilities at Barrow, where submarines have been built for over 100 years. After a long and distinguished career in the Royal Navy, Tim is now the Project Director for the Astute Submarine Programme, joining BAE Submarine Solutions to take charge of this project to produce the latest class of the Navy's nuclear-powered hunter-killer submarines.

Design and construction of the Astute Class is arguably the most challenging engineering project in the UK. It compares in complexity with the space shuttle, involving over a million components and the production of over 7,000 design drawings.

Astute's state-of-the-art pressurised water reactor is more complex than a nuclear power station, with more restrictions placed upon it: it must be engineered and operated in the knowledge that almost 100 people live and work in close proximity - the submarine commander sleeps less than 10 metres away from the nuclear core.

Once deployed, Astute can patrol for 90 days, remaining undetected thousands of miles from home and hundreds of metres underwater.

Specialist engineers working on the design of Astute have undertaken a wide range of engineering activities including:

- Nuclear engineering: providing safety and performance improvements to a state-of-the-art pressurised water reactor that is fuelled for life.
 - Systems engineering: integrating the thousands of sub-systems that require up to 100km of cabling, 23,000 pipes amounting to 10km of pipework, and over 5 million lines of software code – plus managing the supply chain, which includes over 30 main suppliers.
 - Marine and mechanical engineering: providing solutions for the propulsive power train, auxiliary systems and life support. Astute must be quiet, vibration-free and robust enough to withstand a nearby underwater explosion.
 - Hydrodynamics and control engineering: the design of the submarine hull, hydroplanes and control systems to provide control of depth and good manoeuvrability. The submarine must maintain neutral buoyancy and is literally 'flown' underwater.
 - Human factors: ensuring that every system is safely operable and maintainable in all conditions by a relatively small complement compared with previous nuclear powered submarines.
- The presentation is an essential introduction to a visit planned by IMechE West Cumbria on March 17th next year to the 25,000m² Devonshire Dock Hall, the largest building of its kind in Europe, where the remaining Astute class submarines are being built. Details of this visit and all other activities can be found on the web site: www.imechewestcumbria.org.uk.

- For further information on this release, interviews or comments, please contact **Chris George, IMechE West Cumbria Publicity Officer**, on **01946 811771**, email: cgeorge@capalex.com