

Rough Guide to Nuclear Power Generation Seminar 2009

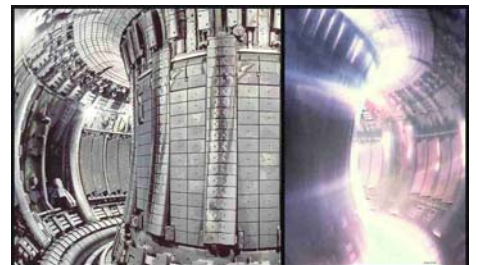
70 members of the Nuclear Institute Young Generation Network recently attended a successful seminar looking at the technology, history and future of nuclear power in the UK and worldwide. The British Energy-sponsored three-day event included visits to the European Fusion Development Agreement (EFDA) JET experimental fusion reactor and Hinkley Point B power station.

A programme of presentations by industry experts gave insightful views into the issues faced by nuclear power, past, present, and future. These included talks by British Energy's Andy Spurr, future successor to Bill Coley as Managing Director of Existing Nuclear, and Stuart Crooks, Safety and Technical Director.

The Tours

Joint European Torus (JET)

Located in Culham, Oxfordshire, JET is the largest magnetic-confinement fusion reactor in the world. It has the capability to generate up to 40MW heating capacity, and can theoretically consume up to 1GW of electrical power. It creates plasma at temperatures well in excess of 100 million Kelvin, temperatures that are required to sustain the fusion reaction on Earth.



The tour began with a classroom introduction to fusion power, focusing on the theory of nuclear fusion and the feasibility of fusion power as a commercial energy source. After descriptions of both JET and its future successor ITER, the groups were taken on a tour of the facility. The visitors were shown the Remote Handling Control Room where the operators control the 'Mascot' servo-manipulator arm to perform work inside the radioactive and hazardous reactor. The groups were lucky to see into the controlled area, as the huge sliding concrete shield doors were open allowing a view of the reactor externals and the large magnets used to contain the plasma. The tour finished with a visit to the main control room where fusion campaigns are controlled and monitored.

Hinkley Point B Power Station

Hinkley Point B has two of the first commercial Advanced Gas Reactors (AGR) built in the UK. First synchronised to the grid in 1976 nine years after it began construction, the station's current maximum capacity is 840MWe. A graphite-moderated, carbon dioxide-cooled fission reaction in enriched Uranium fuel elements produces heat which is used to produce steam in the boilers.

The tour began in the turbine hall where two 3000rpm, 660MWe capacity turbines take the hot steam from the boilers and produce electrical power to be supplied to the grid. The AGR reactors were designed to power standard turbines used at conventional fossil-fuel power stations of the time. By means of comparison, the new EPR-design reactors will most likely be connected to a single 1600MWe turbine. The tour then continued up to a viewing gallery looking out over the cavernous charge hall area, where the fuelling machine can access the top of the twin reactors to exchange fuel and other core components. The final stop was in the full-scale simulator facility, an almost exact replica of the Central Control Room. It is here that Operators undergo initial and continuing training before gaining authorisation to operate the reactors themselves.

The three-day seminar was a valuable and comprehensive insight into nuclear power from its conception to its future. Many thanks go to the Young Generation Network, British Energy and EFDA for their support, the presenters, and the organiser of the seminar, Rob Thorn.

Sam King

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