

**Overview**

Nuclear Technologies has a permanent team of Safety Case Authors based at AWE working on a number of different projects. Our Authors are familiar with the different methodologies and approaches required as safety documentation is structured according to the type of hazard:

- Safety Cases (nuclear projects)
- Safety Basis (non-nuclear/key hazards)

Nuclear Technologies has staff who have authored a number of successful submissions for both safety basis and safety cases. The following is a summary of recent projects.

**Safety Basis Reports – Site Utility Group**

Nuclear Technologies was awarded a contract worth over £300k to provide a team of safety case authors to compile the Safety Basis reports for the power, water, gas and electrical networks.

The challenge was to adopt a new methodology and deliver the reports to the client and assist the facility with taking ownership and presenting the arguments at Safety Committee for approval.

The project was delivered to programme and the client retained the services of Nuclear Technologies to prepare the presentation material for the subsequent safety committee. The Directorate of Infrastructure Safety Committee formally endorsed the entire suite of safety reports.

**Safety Case – Re-kit Assurance Support**

Nuclear Technologies has provided long term safety case support to a re-kit project on an aged high hazard nuclear facility at AWE. The work included the provision of Safety Case Authors and Leaders preparing hazard identification, hazard analysis, ALARP arguments and combines the staged safety reports (for Category B, C and D modifications). The challenge on this project is to prepare proportionate arguments for new equipment that has to interface and work reliably inside the existing arrangement of an aged facility.

One of the strengths that Nuclear Technologies brought to this project was the close interaction with the engineering team and package managers to ensure a proportionate and pragmatic approach. Our author's made sure the Safety Functional Requirements (SFR) were understood and correctly interpreted by the engineering team who are responsible for designing the equipment to deliver them.

This close interaction has strengthened the relationship between designers and safety case authors which is necessary to deliver a robust modern standards safety case.

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**Safety Basis Reports – HELEN Laser Facility**



To understand more fully those processes that occur during a nuclear explosion, fundamental data about the materials involved must be obtained under comparable temperature and pressures. However, it is difficult to replicate the extreme temperatures and pressures that occur during a nuclear explosion by alternate means.

Nuclear Technologies produced the Safety Basis report for the relocation of the HELEN laser facility. This work included Hazard assessment, shielding calculations, ALARP assessments, review and update of decommissioning plans and, environmental impact assessment. The report was internally reviewed and brought to a successful conclusion by being endorsed by the AWE Safety Committee. Moreover, this particular project was identified by the Safety Committee as being an excellent example of how to compile a robust Safety Basis Submission

**Criticality, Shielding and Dose Advice to Enriched Uranium Facility**

The incorporation of sound criticality safety engineering in the design of a new plant is fundamental to ensuring the successful design, construction and operation of a modern nuclear facility. Expert input on criticality, shielding and dose issues is essential in minimising the project risk to the licensee allowing key design decisions to be made and ensuring the development of an optimised plant design.

Since 2003 Nuclear Technologies radiation physicists have been contracted to provide front end advice for the new Enriched Uranium Facility. This support has continued throughout the design phase and has helped to ensure the successful plant design and incorporation of engineered safety measures to provide the highest standards of criticality and radiological safety when the plant is operational.

**Criticality Safety Support**

Since 2000 Nuclear Technologies has provided support to the AWE criticality function. The risk posed by criticality due to the nature of the operations conducted at AWE is one of the main risks on the site. Our staff has been responsible for writing criticality safety cases for modifications to processes in the main fissile facilities and for new processes being introduced to these facilities, conducting annual criticality safety inspections of the facilities handling, processing and storing fissile material and fissile contaminated wastes, writing procedures for use the AWE Criticality Safety Group, writing criticality Safety Cases to address the unique problems associated by decommissioning large fissile material facilities on site providing design advice on criticality safety to the teams designing potential future replacements for the existing fissile facilities on the AWE site.

**Safety Cases – Other AWE Projects**

Nuclear Technologies currently has safety case authors integrated into other major projects at AWE including:

The Front End Development team, new build projects (both nuclear and non-nuclear) and the corporate Nuclear Safety Group where we are assisting with the development of new standards, procedures and the implementation License Conditions. Our Safety Case support at AWE also extends to other specialism's including:

- Human Factors
- Engineering substantiation
- Dose Assessments