

Licensing & Regulatory Process

The civil nuclear industry worldwide is regulated under national legislation to ensure that activities related to nuclear energy and ionizing radiation are conducted in a manner which adequately protects people, property and the environment.

Despite an international consensus on regulatory objectives, national implementations can vary between target-based attitudes to a more rigid rule-based approach.

Rolls-Royce has experience of licensing and regulatory processes:

- In the United Kingdom (a target-based approach);
- In the United States (a rule-based approach);
- In Europe (often a combination of target and rule-based).

Rolls-Royce has the capability to support and guide applicants and regulators through the licensing and regulation processes. This utilises our worldwide experience of all aspects of Safety Case and Environmental Engineering. If niche skills or experience are not available in-house, Rolls-Royce manages the procurement and input of specialist subcontractors to deliver a complete solution.

Regulatory requirements cover the full life-cycle of a civil nuclear facility and require the granting of one or more licences/permits. In addition to a 'Nuclear Site Licence' regulating on-site operational activities, other licences/permits may be required to address linked off-site activities or impacts (e.g. environmental protection, effluent discharges, solid waste management, cooling water abstraction/ discharges etc). Security issues are also an important consideration.

Whilst the principal focus of the licensing and regulatory process is on nuclear specific legislation, other non-specific general legislation also needs to be addressed. Rolls-Royce engineers have a broad ranging skill set encompassing the full range of the regulatory regimes that may be applicable. For example, a variety of licences/ permits may be required to cover construction related activities or on-site disposal of non-radioactive wastes.

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Supporting Capabilities:

- Safety Case Authorship
- Safety Case Management
- HAZOP/HAZAN Studies
- As Low As Reasonably Practicable (ALARP) studies
- Probabilistic Safety Assessment
- Deterministic Safety Assessment
- Fault Tree Analysis
- Environmental Assessment and Analysis
- Best Available Techniques (BAT)
- Construction Environmental Management Plans
- Construction Waste Management Plans



Applications:

Rolls-Royce experience of licensing and regulatory processes has a wide variety of applications, including:

- Supporting operators in the licensing of new build facilities;
- Supporting the reactor vendor in understanding local regulatory requirements, and advising on possible design revisions;
- Ensuring ongoing compliance with relevant standards and legislation;
- Providing guidance on the establishment of a national nuclear framework to enable new build (i.e. to countries new to the civil nuclear industry).

Experience/References:

- Rolls-Royce operates two nuclear licensed sites within the UK; the Vulcan Reactor site at Dounreay and the Company's Core manufacturing facility at Derby. Rolls-Royce manages the ongoing licensing and regulation of both these sites, utilising in-house capability, supported as necessary by specialist subcontractors. Rolls-Royce engineers have thus been provided not only with unique experience of the regulatory processes and their requirements, but also an appreciation of the issues facing site/plant operators. These include the Nuclear Site Licensing and Environmental Permit processes, and compliance with other relevant environmental and waste management regulations.

- Rolls-Royce has reviewed national regulatory regimes against reactor designs in order to identify where further design or analysis may be required to satisfy regulatory authorities. This is particularly the case for reactor types designed primarily for the US market where there is a rule-based approach to nuclear safety and environmental protection, rather than in Europe where target-based approaches are more common.
- Rolls-Royce experience of differing national licensing and regulatory regimes has highlighted the following key areas with differing approaches and requirements:
 - Instrumentation and control;
 - Operator action assumptions;
 - Applicable codes and standards;
 - Classification and categorisation of Systems Structures and Components (SSCs);
 - Fault schedule use and interpretation;
 - Difference in rule-based systems.

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