

# Statement of ONR's research strategy

## Background

The Energy Act 2013 enables ONR to carry out or commission research in connection with its purposes and therefore supports delivery of its strategic goal of being an exemplary regulator.

Nuclear site licensees are responsible for managing the risks of their operations, and the designers and manufacturers of nuclear plant are responsible under the Health and Safety at Work etc Act 1974 for undertaking the research necessary to identify and reduce these risks. The licensees are required by Licence Condition 23 to produce safety cases to demonstrate the safety of their operations, so they are responsible for performing any research necessary to substantiate their safety claims.

ONR's research needs are different as they must support its independent regulatory decision making. This needs to be based on objective scientific and technical understanding of the safety issues (as reinforced by the revised European Nuclear Safety Directive).

## Strategic research objectives

ONR's objectives for research are consequently:

- to test claims made in licensees' safety cases where the state of the art recognises there may be significant uncertainties
- to ensure ONR has continuing access to independent scientific and technical expertise in areas where this is scarce
- to identify emerging technologies with the potential to provide licensees with new ways of managing and reducing existing risks
- to identify new information and understanding that might undermine existing safety cases
- to improve ONR's understanding of potential safety issues associated with technologies proposed for future deployment in the UK, where government has informed ONR that it has sufficient confidence that these may proceed
- to enhance the efficiency and effectiveness of the nuclear regulatory system

## Approach to delivery

ONR's strategy for meeting these objectives is:

- its Technical Specialisms identify topics that need further research to meet these objectives
- ONR liaises with other public bodies e.g. the Environment Agency and UK nuclear industry research boards, to coordinate its research needs with theirs
- The research topics are reviewed, collated and published
- If appropriate, the nuclear industry is invited to commission research to address these topics and share the results with ONR
- If not, ONR commissions the research itself and publishes the results

ONR does not commission research either to support the commercial development of nuclear technologies or in areas for which other public bodies have regulatory responsibilities or are responsible for providing authoritative advice.

The table identifies specific outputs where research will support ONR regulatory decision making in its priority areas.

Research objective	Outputs
Challenging, and exploring uncertainties in safety cases	In the structural integrity discipline, the technology to identify and sentence potential failure mechanisms in high temperature steel components continues to improve which can reduce the range of uncertainty. ONR has a number of research projects in this area
Giving ONR access to independent sources of information	Understanding the long term degradation of graphite components underpins the continued safe operation of the UK's gas cooled reactors. It is so significant that ONR's structural integrity group supports research independent of the licensee to ensure our regulatory decisions are based on objective independent evidence
Investigating potential safety and security issues in new technologies	The Control & Instrumentation specialism has an active research project to explore potential safety and security vulnerabilities of Programmable Logic Controllers and smart instruments to cyber threats
Investigating new information which may undermine existing safety cases	Confirmatory research will be used to ensure the knowledge of ONR's specialists remains cutting edge where necessary, and we are aware of the current state of knowledge across the international nuclear and high hazard community
Exploring potential issues for new technologies proposed for the UK	Research to identify potential issues in new designs will cover a wide range of topics including, for example, materials, structural integrity, chemistry, fault studies, etc.
Improving regulatory processes	Work here could include research to improve the definition of relevant good practice in particular specialisms, or a framework for balancing safety and security needs

## Communicating outputs and evaluation

ONR will publish an annual research update to confirm and summarise the work completed. Our evaluation and publication process will ensure ONR's research generates useful outputs and is disseminated to maximise the potential benefits.