



Office for
Nuclear Regulation

A guide to enabling regulation



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Foreword

ONR's purposes outlined in the Energy Act 2013 confer on us a duty to ensure that the hazards from the nuclear industry are controlled to protect people and society. We are a legally empowered sovereign regulator with obligations to hold to account and ensure industry protects society. Our independence as a regulator is vital and our independence in decision making is absolute.

Nevertheless, we need to be cognisant of our strategic context, agile in how we deliver our purposes in the face of change, and responsive to government expectations that regulators should adopt approaches and behaviours that enable. Provisions in the Regulators' Code expect us to carry out our activities in a way that supports those we regulate to comply and grow.

To be an efficient and effective regulator that is fit for the future, we need to ensure that we identify and learn lessons from our activities and consistently employ practices and behaviours that have been proven to deliver successful safety and security outcomes. I am seeking to build on good regulatory practices, encourage innovation and lead an organisation which regulates in a manner that enables the best safety and security outcomes to be routinely achieved.

In so doing I highlight the growing need to improve confidence in compliance through greater transparency and certainty; to better understand and minimise undue negative economic impacts; and to engender increasing recognition that the speed at which improvements can be realised is often a key aspect in the risk balance.

Enabling regulation is a term we have been using increasingly over recent years. Put simply, it means that we will take a constructive approach with dutyholders and other relevant stakeholders to enable effective delivery against clear and prioritised safety and security outcomes. We can adopt enabling approaches most readily where the dutyholder is compliant with the law. Enabling is not new for ONR and there are many examples of how an enabling approach has been successful in the past.

The key features of a successful enabling approach are set out in this document. The intent is to explain enabling regulation as implemented by ONR, including enabling principles, enabling behaviours, and some examples of how we have enabled to secure improved safety and security outcomes. It also places enabling regulation in the context of the legal obligations on ONR and our dutyholders.

This document does not represent formal policy or guidance, but instead is intended to provide helpful information to support better understanding, discussion and development. Its publication allows us to share our thinking with dutyholders and other external stakeholders to demonstrate compliance with the regulatory code and provide practical examples of where an enabling approach has worked well.

We will also continue to develop this approach to consider other ways in which it can benefit the industry, ensuring that people and society are protected. For example, we have built on the enabling principles outlined in this document to consider explicitly the economic impact ONR activities have on the industry. Furthermore, through our approach to innovation, we are seeking to enable innovation in the nuclear industry which has the potential to deliver benefits including improvements to the high standards of safety, security and safeguards we expect.

Nothing in this approach alters the obligations on industry to comply with the law. Enabling regulatory practices do not prevent or curtail us from continuing to hold the industry to account on behalf of the public; we will continue to use our enforcement tools appropriately, proportionately and independently.

Both industry and government have a vital part to play in creating and sustaining the conditions where an enabling approach can continue to be successful, and we are working with the Safety Directors' Forum (SDF) to develop approaches further. For example, there may be opportunities for industry to take an enabling approach in developing more robust internal regulation, as well as improving the quality of dutyholder submissions to articulate more clearly why a specific activity will be safe and/or secure.

Finally, I believe the practices, behaviours and examples described in this guide demonstrate that ONR, in adopting an enabling approach, is both effective and efficient in its regulation of the UK nuclear industry. However, we will continue to challenge ourselves to ensure that we develop as a modern, flexible and agile regulator, which is particularly important in today's changing nuclear landscape.

In so doing, we will always act in a way that ensures that people and society are protected, holding dutyholders to account whenever appropriate.



Mark Foy
Chief Nuclear Inspector

What do we mean by enabling regulation?

Enabling regulatory practices do not prevent or curtail us from continuing to hold the industry to account on behalf of the public; we will continue to use our enforcement tools appropriately, proportionately and independently.

Our definition of enabling regulation is:

“A constructive approach with dutyholders and other relevant stakeholders to enable effective delivery against clear and prioritised safety and security outcomes.”

The features of a successful enabling approach are enshrined in the regulatory principles and can be summarised as:

- Building on regulatory good practices and successes.
- Ensuring priorities are established, understood and agreed.
- Being clear on legal duties and what is needed for compliance.
- Focusing on outcomes rather than process.
- Constructive, committed, open and early engagement to avoid surprises and build trust.
- Ensuring solutions are fit for purpose¹ in meeting the requirements of the law efficiently and effectively.
- A willingness to address blockers, distractions and unnecessary bureaucracy.

¹Fit for purpose means legally compliant, but appropriate to the particular risks that need to be controlled. What is fit for purpose on a high hazard decommissioning site may be different to other sites where the risks are under greater control. What is fit for purpose for a plant with a limited lifetime is likely to be different to a new plant with a potential 60 year lifetime.

An enabling approach also:

- Includes consideration of strategic factors in regulatory decision making; sometimes colloquially referred to as “programme or holistic ALARP”. Although ALARP (the legal duty to reduce risks to ‘as low as reasonably practicable’) usually features strongly in safety cases, the scope of the arguments can prove too narrow, particularly in complex cases, and bigger picture factors also need to be considered in the regulatory decision.
- Recognises that the speed at which improvements can be realised is often a key aspect in the risk balance and a pivotal factor in identifying the best safety or security outcome.
- Considers the economic impact to the industry from ONR activities, in terms of the impact of our frontline work and the cost impact of work required as a result of those activities to bring the industry into compliance with the law and the expected standards.

ONR recognises that there cannot be a “one size fits all” approach to applying an enabling style of regulation to the range of dutyholders and safety and security challenges that are present across the industry. Instead, we need to ensure that we consistently apply the regulatory principles that underpin our activities as set out in our Enforcement Policy Statement. We should be:

- Proportionate in dealing with compliance gaps and securing compliance.
- Consistent in our approach.
- Targeted on the most serious risks or those least well controlled.
- Transparent about how we operate, our decision-making and what dutyholders may expect.
- Accountable for our actions.

This is not new, but the UK Regulators’ Code now expects us to report on how we achieve these principles, as well as how we comply with the first provision of the Code, that we carry out our activities in a way that supports those we regulate to comply and grow. Consistently applying the enabling regulation principles described in this guide in our work will support our demonstration of compliance with the Code.

Principles - enabling regulation

As a fundamental principle, we have a duty to ensure that the hazards from the nuclear industry are controlled to protect people and society. We are a legally empowered sovereign regulator with obligations to hold to account and ensure industry protects society. Enabling regulation does not undermine this approach; indeed, many of the principles associated with enabling regulation are widely recognised as good, regulatory practices and have achieved many positive outcomes for the benefit of society.

In general, ONR seeks to adopt a persuading and influencing approach to regulation. The principles listed below are intended to apply to situations where the dutyholder is either broadly compliant with the law, or where using formal enforcement powers (such as serving a Notice or withholding our permission) would be disproportionate to the non-compliance.

In cases of non-compliance we apply our formal powers of enforcement proportionately and in line with our Enforcement Policy Statement (EPS) and Enforcement Management Model (EMM). Where the non-compliance is more significant, we will limit the extent to which our inspectors can act in an enabling manner. We will still seek to apply the principles so far as is reasonable, but the fundamental principle of ensuring that the hazards from the nuclear industry are controlled to protect people and society remains inviolable/firm/resolute.

The principles are:

- 1. We focus on clear priorities for safety and nuclear security, and communicate these to our dutyholders and key stakeholders.**
 - i. We agree strategic safety and security priorities with dutyholders, at an ONR Division level, taking cognisance of dutyholders strategic business context.
 - ii. We regulate in a manner that is aligned with these priorities, and avoid creating undue distractions from achieving them.
 - iii. When improvements are needed, we are clear about what precisely is required for legal compliance, formalising this in a Regulatory Issue.
 - iv. Wherever appropriate, we work with key stakeholders to identify common priorities and remove barriers to improving safety and security outcomes.
 - v. To support continued compliance with the UK Regulators' Code, we carry out our regulatory activities in a way that supports growth for legally compliant dutyholders.

2. We are constructive in the resolution of agreed safety and nuclear security priorities.

- i. We work constructively with stakeholders to agreed common priorities where possible.
- ii. We focus on outcomes rather than processes.
- iii. Where we have raised a regulatory issue, we agree reasonable timescales for achieving compliance and are proportionate in our subsequent regulation of the Issue.
- iv. We maintain our independence whilst seeking opportunities for early engagement to maximise the likelihood of achieving our goals.
- v. We will take into account well understood and managed risks when making decisions in the pursuit of strategic safety and security goals.

3. We aim for efficient, proportionate and consistent approaches to safety and nuclear security - without compromise of intent to achieve the required safety performance.

- i. We require solutions that are legally compliant while being fit for purpose within their context.
- ii. We encourage and facilitate the removal of undue bureaucracy and will challenge outdated practices.

4. We maintain public trust by targeted, transparent, risk-informed oversight of safety and nuclear security, and use our legal powers appropriately in the public interest.

- i. i. We undertake our inspections and other interventions in a targeted, risk-informed manner.
- ii. We only require what the law requires and we seek this in a non-prescriptive manner where possible.
- iii. We publish guidance for inspectors, which set out the assessment and inspection processes and standards that we use to judge dutyholders' performance.
- iv. Our presumption is that we publish information describing our activities and explaining our enforcement decisions. We also publish guidance documents such as our EPS and our guidance for inspectors, which set out the assessment and inspection processes and standards that we use to judge dutyholders' performance.
- v. Where appropriate, we will take enforcement action in accordance with our EPS through the application of our EMM. An enabling regulatory approach does not prevent or curtail use of our enforcement powers to restore compliance or hold to account.

5. We actively promote the mature self-regulation of day-to-day safety and nuclear security by dutyholders.

- i. We recognise that the industry has an important part to play in maintaining the conditions where enabling regulation can be used effectively. We therefore set clear expectations for self-regulation by dutyholders, including governance, leadership, effective internal oversight, and culture.
- ii. We are clear and open about our expectation of right first time safety cases and security plans, and effective management of the supply chain.
- iii. We target our discretionary permissioning decisions to where they add value or where the risks are most significant or not well controlled.
- iv. Where we find repeat or significant non-compliance, we expect dutyholders to address the root causes and identify potential failures of their self-regulation, not just the non-compliance itself.

6. We explicitly consider the economic impact that ONR activities have on the industry, in terms of the impact of our frontline work and the cost impact of work required as a result of those activities to bring the industry into compliance with the law and the expected standards.

- i. We'll ensure we understand the implications of the requests we make on industry in terms of cost and in the context of any shortfall. For example in its response to requests or demands for improvement, to ensure we are proportionate in what we are asking industry to do in accordance with the Regulators' Code.
- ii. The scope of this excludes ONR charges, but includes other costs to industry, including costs associated with lost production, modifications to plant or processes, analysis and resource in responding to ONR requests or expectations. It also includes the costs arising from all ONR purposes, including complying with both goal setting and absolute requirements.
- iii. We will engage openly with industry in line with an agreed protocol for the request and provision of cost information on the financial impact of regulatory requirements or recommendations. This will be most relevant where there is a difference of opinion between ONR and a licensee's position in relation to implementation of a safety enhancement measure, although recognising that some requirements will be mandatory and not subject to any test of reasonable practicability.

Behaviours and ways of working for enabling regulation

To apply a consistent enabling approach, both industry and ONR recognise the behavioural attributes that support or possibly detract from effective delivery of safe and secure outcomes.

Whilst not exhaustive, the following table illustrates both effective and ineffective enabling behaviours and ways of working:

Effective behaviours and ways of working	Ineffective behaviours and ways of working
Establish strategic, long term, risk-based priorities and ensure these are well founded and properly understood within the wider context.	Adopt a short-term reactive approach to activities, with little thought to overall priorities or longer term outcomes.
Engage openly with stakeholders to agree priorities, provide guidance and advice, to establish a “no surprises” culture.	Adopt a closed approach with stakeholders, sharing little or no information.
Regulate to secure the solution that maximises the safety and/or security benefit.	Take an overly cautious approach to regulation that focuses on the reputational risks to ONR rather than the risks to society and/or workers.
Proactively identify shortfalls in a proposed approach at the earliest opportunity and provide advice.	Passively wait for problems to be encountered.
Work with dutyholders to agree Regulatory Issues and associated Action Plan timetables and be proactive in regulating to achieve timely compliance.	Impose Issues and compliance timescales without seeking to understand dutyholders’ perspectives, reasonable constraints and safety or security priorities.
Focus on outcomes.	Focus on tasks/projects without giving due regard for the sought outcome.
Consider risk factors in a wide context as part of our decision making, ensuring strategic factors are considered, as well as ALARP and other legal requirements.	Assess risks on a case-by-case basis without consideration of interactions between faults or placing the risk in the wider context.
Encourage development of fit for purpose solutions which meet legal requirements and represent good practice appropriate to the prevailing circumstances.	Seek unrealistic or disproportionate design standards over complex designs or push for gold plated solutions.
Recognise and accept that increases in the short-term risk profile may be necessary in order to reduce long-term risk and hazards.	Take a rigid or short-term approach to risk reduction, seeking to reduce risks without consideration of the overall picture.
Conduct regulatory oversight in a way that provides sufficient control, but avoids unnecessary diversions or distractions.	Give undue attention to details which have no meaningful impact on the outcome.

Examples - enabling regulation

This section gives examples of enabling regulation in practice. The case studies represent work from across all our regulatory divisions. They are intended to provide an insight into how an enabling approach has secured significant safety and security improvements without compromising standards or our independence. In many cases, to achieve the desired outcomes, we have worked in a particular way. Many of the behaviours and ways of working listed in the previous section are common to a number of the examples presented.

The Sellafield G6 approach to achieving hazard and risk reduction

At Sellafield, we identified that an enabling regulatory approach could enable Sellafield Ltd to accelerate hazard and risk reduction for the site's legacy facilities.

What outcome was sought?

- Accelerated risk and hazard reduction on the site.

What was the issue preventing this outcome?

- ONR was one of a number of stakeholders that had, in the past, adversely affected the delivery of projects designed to reduce risk on the site due to the perception of a drive for “gold plating” of engineered solutions and safety case submissions.
- Historically, in response to events and regulatory findings, the site and ONR had become too bureaucratic, and at times, overly conservative and risk-averse.
- Although all stakeholders stated individually that risk and hazard reduction was the number one priority for their organisation, this wasn't always evident from the actions or approaches taken.

What was done differently to enable the solution to be reached?

- Senior representatives of the key stakeholder organisations (termed the G6) were invited to discuss “what is getting in the way of progress at Sellafield?”
- Together, we identified a common goal and the barriers to achieving accelerated risk and hazard reduction. All organisations committed to consider how they could challenge the barriers identified and where appropriate, each other.
- We ensured that commitments were upheld and initially led these meetings, as well as the tactical meetings that were set up to deliver the practical activities agreed by the G6.
- We actively encouraged innovative, fit for purpose and legally compliant solutions focused on the priority outcome, challenging situations where solutions appeared to be over-engineered or with very long delivery times.

What were the outcomes and benefits?

- Tangible risk and hazard reduction has begun at several of the legacy facilities, while in others, the group has significantly accelerated work programmes, in some cases by decades.
- The predicted costs of several key decommissioning projects have been reduced substantially.
- The “G6 approach” has become a trademark used to promote and encourage innovative thinking, the adoption of fit for purpose solutions and a focus on early delivery of projects at Sellafield.
- The “can do attitude” and “permission to innovate” that began with G6 initiatives has spread more widely across the site and into the supply chain.
- This enabling regulatory approach was recognised as a “good practice” in the International Atomic Energy Agency’s (IAEA) review meeting for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management in 2015.

Accelerating the export of bulk metal and canned oxide fuel at Sellafield

What outcome was sought?

- Accelerating the programme for the retrieval of the 50-year-old canned oxide fuel from the oldest fuel storage pond at Sellafield - a key activity in reducing risk and hazard.

What was the issue preventing this outcome?

- The canned oxide fuel was being removed from the 1940s pond and transferred to a nearby ageing facility called the Active Handling Facility (AHF). National Nuclear Laboratory (NNL) operates the AHF (under a lease from Sellafield Ltd) and in addition to supporting the retrieval of the canned oxide fuel, provides specialised operational capability to the Naval Nuclear Propulsion Programme and the civil nuclear reactor operations programme.
- As well as managing these competing contractual requirements, NNL was operating an ageing facility - certain key plant items were nearing end of life, affecting the reliability and operational capability of the facility and causing delays to the oxide fuel export schedule.

What was done differently to enable the solution to be reached?

- Our inspectors first engaged with NNL directors to form a working relationship and to reinforce the importance of accelerating the oxide fuel removal programme. We facilitated the formation of a tri-partite working group (Sellafield Ltd, NNL and ONR) which met regularly, working together to identify all opportunities to remove blockers to acceleration and enable early delivery of the retrievals.
- A constructive relationship was established between the three stakeholders, based on trust and openness.
- Our inspectors adopted and promoted a flexible, pragmatic regulatory approach to permissioning; specifically for plant repairs and modifications, accepting fit for purpose, legally compliant solutions and safety justifications. This approach enabled key plant and operations to be returned to service in a timely manner.
- NNL shared commercially sensitive planning information, which facilitated an optimised programme for the timing and duration of upcoming planned outages for key plant items and work streams in the AHF. Where practicable, NNL rescheduled outages in a way that allowed for acceleration of the fuel export programme.

What were the outcomes and benefits?

- Bulk metal fuel export combined with canned fuel export has resulted in a 70% reduction of the pond's radiological inventory.
- The export programme was completed ahead of schedule.
- The lessons leading to success of this project have been promulgated around the site and used as an example to promote and illustrate the benefits of seeking fit for purpose solutions and an adaptive approach to projects.
- NNL met its commitments for the retrievals programme and its other competing commercial contracts.

The Generic Design Assessment (GDA) process

What outcome was sought?

- Assessment of reactor designs proposed for construction in Great Britain on a generic basis, in advance of any site specific proposals, to give clarity on regulatory requirements and their financial impact, thereby reducing project commercial risks and optimising the safety of the design.
- More effective and efficient regulatory assessment of new reactor designs by providing clarity of regulatory requirements at the earliest opportunity. This facilitates greater regulatory influence, allows potential investors to gain accurate understanding of the likely cost of new nuclear projects and provides a more stable construction programme.

What was the issue preventing this outcome?

- The traditional approach to the licensing of new reactor sites results in a significant amount of the regulatory assessment work being performed in parallel with reactor construction and after the financial investment decision has been made.
- This can result in programme delays and cost overruns as regulatory concerns are highlighted during construction, some of which may require significant design changes. For example, the construction of Sizewell B was subject to significant delays during the construction phase due to design changes emerging late in the day, some of which were driven by regulatory concerns.

What was done differently to enable the solution to be reached?

- ONR and the Environment Agency developed the GDA process in which we work together to assess new reactor designs significantly ahead of the financial investment decision and construction.
- A step-wise approach is adopted with the assessment becoming more detailed and longer at each step. This allows for significant regulatory issues to be identified at the earliest stages.

What were the outcomes and benefits?

- Increased certainty of regulatory issues and reactor design impact and cost, thus mitigating regulatory uncertainty on cost and schedule and, as a result, informing investment decisions and construction scheduling.
- To date, and in line with the ALARP principle, we have agreed a number of design enhancements which will improve the safety and security of reactor designs assessed within GDA.

Regulation of the Dounreay Exotics Consolidation Programme (DECP)

What outcome was sought?

- Timely, safe and secure transfer of Category 1 nuclear materials from Dounreay.

What was the issue preventing this outcome?

- There were complexities and major variations in the legacy materials and conditions, and incomplete historical data.
- There were many stakeholders and issues with ensuring appropriate governance, delivery and regulation, given a challenging strategic context.
- There were inflexibilities in the arrangements and approaches in all organisations with a role in delivering the outcome.
- There was limited delivery resource and other factors affecting the ability to meet the time constraints.

What was done differently to enable the solution to be reached?

- Governance was addressed by adopting a collective approach, bringing senior stakeholders together to steer and advise (termed the C6 group) together with a support working level group represented by all key stakeholders, including ONR. This provides a forum for the main participants of DECP to identify, discuss, constructively challenge, and resolve blockers to delivery more quickly than previous engagement processes.
- A co-ordinated approach was taken to regulation of safety, security and safeguards to provide integrated regulation of the site-to-site operations, covering nuclear and transport safety, security and safeguards.

What were the outcomes and benefits?

- A significant proportion of inventory was safely and securely moved in 13 months, demonstrating progress against high level international commitments.
- Timely regulation focusing on the outcome with the collective aim to meet the declared end date safely and securely with fit for purpose and compliant solutions, for example, special shipment approvals.
- Better prioritisation resulting in improved effectiveness.
- Early clarity on assumptions, targets and shared outcomes.
- An improved shared understanding of the future challenges whilst demonstrating that risks are ALARP.
- Effective permissioning process through an integrated regulatory control plan aligned with that of the overall consolidation programme.

Licensing a new Reactor - Hinkley Point C

What outcome was sought?

- The licensing of a new site in preparation for the construction of the first civil nuclear reactor power plant to be constructed in Great Britain since Sizewell B.

What was the issue preventing this outcome?

- Previous licences for the site had been held by the central electricity generating board - a very experienced licensee with a mature understanding of the licensing process and conditions. However a new organisation (NNB Ltd) was applying for the new licence and this meant they were unable to demonstrate mature arrangements for compliance against all conditions at licensing stage. This is because a number of the licence conditions are only relevant once construction or commissioning activities commence on site.

What was done differently to enable the solution to be reached?

- ONR recognised that a number of the licence conditions are only relevant once construction or commissioning activities commence on site. Hence, what comprises having “adequate arrangements” will be different for activities that will not commence for some time.
- This approach enabled agreement of licence conditions where mature arrangements would be needed at the point of licensing and others where further development would be required before activities take place on site.
- Recognising that erecting and maintaining marking of the site boundary posed a serious risk to personnel, ONR agreed to the exclusion of licence condition 2(4) until such time as it was practicable to mark the boundary.
- Recognising that construction or installation of the new nuclear installation does not pose a radiological threat, ONR supported the licensee’s request for the government to suspend the Nuclear Installations Act requirement for nuclear liabilities insurance until fuel was brought onto site.

What were the outcomes and benefits?

- The site licence application was successfully submitted at the first attempt with the site licence being granted in November 2012.

Transitioning from defueling to decommissioning at Magnox reactor sites

What outcome was sought?

- Safe, compliant, proportionate controls on shutdown reactor sites once fuel has been removed from the site.

What was the issue preventing this outcome?

- ONR has specified that a number of primary powers permissions were required before changes could be implemented - these included changes to the approved emergency arrangements and approved operating rules. It also included the licensee's own arrangements to seek ONR's formal agreement to changes to organisational structures under what is known as derived powers. The number of different permissions made it challenging to demonstrate proportionality in our regulation.

What was done differently to enable the solution to be reached?

- We engaged with the licensee to ensure that they had a robust and repeatable process for the transition at each site, and as successive sites went through the transition, our expectation was that a similar process, applied to a site in a similar starting position, would result in a similar outcome.

What were the outcomes and benefits?

- The first application of the process resulted in significant ONR assessment to establish a baseline, so subsequent applications have required less assessment and less discussion as the licensee has a clear understanding of our expectations.
- The transition process, which is a significant investment of time and resource, is now being completed significantly faster and with significantly less regulatory overhead.

Transporting very low level radioactive wastes

What outcome was sought?

- Removing the safety risk associated with stockpiling of waste and the economic burden on organisations transporting very low level radioactive wastes that are so low as to be permitted for disposal as normal waste in public landfill.

What was the issue preventing this outcome?

- Class 7 transport regulations require radioactive material to be transported using special transport packages.

What was done differently to enable the solution to be reached?

- We carried out a technical assessment concluding that, if the waste has sufficiently low radioactive content to fall within relevant exemption limits (known as 'dustbin limits', the risk from transport is minimal, with no resulting impact on public safety.

What were the outcomes and benefits?

- ONR issued an authorisation to exclude the transport of very low level radioactive wastes which meet these criteria from the requirements of the Class 7 transport regulations.
- This means that organisations like schools and universities that are allowed to dispose of very small quantities of radioactivity in public landfill may now use normal refuse collection services to do so, without the need for a specific transport package.

Granting permission for transition from generation to defueling at Wylfa

What outcome was sought?

- Safe and efficient defueling of Wylfa nuclear power station to remove the hazard from the site and to ensure timely reprocessing of the spent fuel at Sellafield, in line with our strategy to facilitate accelerated risk and hazard reduction at Sellafield.

What was the issue preventing this outcome?

- During generation, the reactors were operated in compliance with operating rules approved by ONR. Defueling with the approved operating rules in place would require regulatory permission under primary powers, should changes be required to the operating rules. This could introduce delays in the defueling programme or prevent optimal operation of the fuel route.

What was done differently to enable the solution to be reached?

- In preparation for the transition from operations to defueling, our regulatory interventions at Wylfa focused on the fuel route.
- We reviewed the evidence from the defueling of several other Magnox reactors, which confirmed that the licensee had a robust and repeatable process for this phase of operations.
- We adopted a pragmatic approach, concluding that any further permission under primary powers to amend operating rules would be disproportionate. Consequently, we withdrew the approval, enabling the licensee to operate more flexibly during defueling.

What were the outcomes and benefits?

- The revised approach enables Wylfa to focus on defueling and removes the risk of delays in defueling operations. It also enables accelerated risk and hazard reduction at Sellafield.
- It presents a saving in time and resource for the licensee and ONR.
- This approach is being captured in ONR's guidance to help inform our regulation of the defueling of Advanced Gas-cooled Reactors (AGR) at the end of generation.

Returning reactors to full power at Heysham 1 and Hartlepool

What outcome was sought?

- After identification of cracking affecting a single boiler spine on a unit at Heysham 1, an adequate safety case was sought to enable the return to full power operation of the three unaffected reactors at Heysham 1 and Hartlepool.

What was the issue preventing this outcome?

- The safety case relied on complex thermal modelling, which could not be validated until the reactors had been modified and each one had returned to service with installed thermocouples to monitor boiler spine temperatures.
- There was a desire to increase power on the three unaffected reactors before all the data became available as the licensee considered its safety case was robust and that the level of risk was ALARP.
- However, ONR considered that the safety case was not sufficient to support higher power operation and required the thermal modelling to be validated in advance of returning to full power operation.

What was done differently to enable the solution to be reached?

- Instead of delaying power increases until thermocouple data became available, ONR engaged with the licensee to identify that an alternative ALARP argument could be made which would allow operation at an interim operating power level until the data became available.

What were the outcomes and benefits?

- An adequate safety case was demonstrated and we granted permission for the three unaffected reactors to increase their operating power, securing safe operation and maintaining an appropriate regulatory hold on undertaking ultimate full power operations until further evidence was available.
- Operational problems on one of the reactors meant that the thermocouple data was not available in a timely manner, which extended the benefits of this enabling approach.
- Once the data demonstrated the licensee's thermal modelling to be accurate, ONR gave permission for the reactors to return to full power.

Processing failed fuel on advanced gas-cooled reactor (AGR) sites

What outcome was sought?

- A more effective overall process for handling failed AGR fuel that optimises the use of “bottled” failed fuel elements.

What was the issue preventing this outcome?

- Fuel that has failed whilst in an operating AGR is stored in reactor buffer tubes on the site. There are a limited number of buffer tubes, which restricts storage capacity and hence there is the potential to constrain operations. Failed fuel is placed in a containment “bottle” by the site, which is then used to transfer the fuel to Sellafield inside the normal fuel transport flask.
- Processing the fuel on the reactor site without placing it in a containment bottle increases the risk of contamination to the sites fuel storage pond, with the potential of a short term impact on pond radiological conditions and subsequent higher discharges from the site. The containment “bottle” minimises the impact of contamination resulting from the failed fuel.
- Sellafield has limited capacity to receive bottled fuel and processing it places a burden on a facility that supports important hazard and risk reduction activities on the site.

What was done differently to enable the solution to be reached?

- A trial of unbottled fuel processing was carried out at Hunterston B, and we worked closely with the Scottish Environmental Protection Agency to ensure that the increase in on site risk from the failed fuel was effectively managed and controlled.
- We satisfied ourselves that there was no increase in risk to the public from the modified approach, the normal transport flask for the fuel providing adequate containment during transport to Sellafield.
- We recognised and accepted that the short-term risk provided significant longer-term benefits, in terms of accelerated risk and hazard reduction at Sellafield.

What were the outcomes and benefits?

- The trial was completed successfully and by minimising the residence time of the fuel in the station pond, activity levels were comparable to processing fuel that had not failed.
- This processing route will reduce the hazard on power station sites and enable transfer of the fuel to Sellafield, which is better placed to effectively manage storage and handling of this fuel.
- It will also enable Sellafield to be better placed to prioritise and manage hazard and risk reduction on the site.

Undocking of HMS Albion during HMS Vanguard's Deep Maintenance Project at Devonport

What outcome was sought?

- Enabling the timely undocking of HMS Albion (amphibious transport dock) to be conducted safely and on time so that the Ministry of Defence could maintain its strategic priorities.

What was the issue preventing this outcome?

- During the docking of HMS Vanguard in 9 Dock at Devonport, HMS Albion was docked in the neighbouring 10 Dock facility. Following completion of HMS Albion's maintenance period it was identified that multiple mobile cranes would be required to support her exit from dry dock. This included a mobile crane positioned on the 10 Dock East which has the potential to interact with the 9 Dock cranes, as well as other nuclear support facilities.
- Fault sequences initiated by mobile cranes outside the 9 Dock boundary had not been considered within the plant safety case by the site licence company, Devonport Royal Dockyard Ltd, and were not within the control of 9 dock management.
- Delaying the undocking of HMS Albion to update the safety case would mean the reduction of a major naval asset to support defence requirements.

What was done differently to enable the solution to be reached?

- Devonport Royal Dockyard Ltd produced a Category A safety submission to enable the use of mobile cranes on the neighbouring docksides, which allowed 9 Dock management to control the use of mobile cranes in the vicinity of the nuclear hazard.
- ONR recognised the strategic importance of undocking of HMS Albion and the timescales this was required within. As such we undertook a proportionate review of the licensee's safety submission and considered existing intelligence of safety operations on the site. Inspectors engaged with the site to consider the licensee's arrangements for controlling the potential hazard to 9 Dock operations. These arrangements included 9 Dock management controlling vehicle access keys for 8 and 10 Dock and a 9 Dock duly authorised person required to sign off all lifting plans in 10 Dock East and 8 Dock West.
- We also considered the safety analysis already produced to justify the mobile crane that was to be used to perform the operation, along with previous human factors inspections associated with mobile cranes on the site. The use of existing regulatory intelligence in this area minimised the assessment required for this permission.

- Our targeted interventions enabled us to determine that risks from mobile crane operations in adjacent facilities are suitably low and would be appropriately controlled. This resulted in a timely, balanced and informed regulatory decision, granting permission to allow the use of mobile cranes in the vicinity of 9 Dock and enable the undocking of HMS Albion in a timely manner.

What were the outcomes and benefits?

- By modifying our approach and taking previous regulatory intelligence into account, ONR avoided delays to national strategic priorities, and ensured nuclear safety was maintained.

Development of the Security Assessment Principles (SyAPs)

What outcome was sought?

- Transformation of security regulation from a prescriptive to an outcome focused approach that mirrors ONR's approach to safety regulation. What was the issue preventing this outcome?
- Technical security guidance documents were primarily focused at the tactical level and were written using directive language that encouraged a prescriptive approach by ONR to accepting dutyholders.
- A persistent, legacy culture that was comfortable with prescriptive regulation and resistant to change.
- Security was not respected as a professional discipline or considered as a board-level issue by licensees, resulting in inadequate capability and capacity, a lack of resourcing and suitably qualified and experienced personnel.

What was done differently to enable the solution to be reached?

- The SyAPs were developed by ONR, which were recognised as a significant piece of work, critical to the wider transformation of security regulations.
- Their introduction was effectively managed to ensure effective governance and oversight; allocated sufficient dedicated resource; and provided with a realistic timescale for completion.
- Stakeholder engagement was a fundamental principle for the project, with dutyholders playing a major part in document development. This included multiple workshops and consultation sessions with open and transparent responses provided to all dutyholder comments or queries.
- SyAPs and the supporting documents were authored at OFFICIAL and aimed more at the strategic level. This allowed open communication using language that was familiar to boards and non-security specialists. The SyAPs document and all of the OFFICIAL technical inspection guides were published on the ONR website.

What were the outcomes and benefits?

- The transformation project has full support across the industry at all levels. Stakeholders are working collaboratively to share learning and ensure successful implementation of SyAPs.
- Harmonisation of the approaches for security and safety regulation, ensuring dutyholders work with and recognise "one ONR".
- Dutyholders have taken responsibility and ownership for their security arrangements, encouraging self-determination, innovation, continuous improvement and an improved security culture.

Securing corporate improvements in asbestos management at Magnox Ltd to reduce risks

What outcome was sought?

- A proportionate and fit-for-purpose approach to asbestos management across all Magnox Ltd. sites to ensure risks to health are reduced so far as is reasonably practicable.

What was the issue preventing this outcome?

- Gaps in corporate understanding, co-ordination and oversight of asbestos management, resulting in uncoordinated and inconsistent asbestos management solutions being adopted across Magnox sites.
- Historical lack of regulatory focus, resulting in un-coordinated, ad hoc regulation at individual sites, and silo working within ONR's regulatory functions.
- An inability to take a holistic approach to the problem, with asbestos risk management based on poor and misunderstood evidence.

What was done differently to enable the solution to be reached?

- Relevant ONR regulatory functions contributed to the development of a revised regulatory strategy, adopting a coordinated and balanced approach to influencing the management of asbestos on Magnox sites.
- We brought together senior licensee and NDA stakeholders to attend regular meetings with ONR to build and maintain effective and constructive relationships to allow all stakeholders to understand the extent of the issues, and agree fit-for-purpose solutions within the legal framework.
- Evidence was gathered using co-ordinated, targeted site visits which also assessed compliance against legal standards. These visits included one-to-one discussions with key personnel, and were also used to assess the capability of the internal regulator and improve its competence where necessary.
- Proportionate regulatory action was taken where site compliance had fallen below legal standards, with a flexible and pragmatic approach adopted to sustain the overall direction of travel for long-term corporate compliance.

What were the outcomes and benefits?

- Improved co-ordination of asbestos management, establishing a stronger corporate lead on asbestos has helped Magnox to learn from its performance across its sites and establish standards of good practice. This reduces the risks of “re-inventing the wheel” and should prevent a repeat of previous failures to meet minimum legal compliance.
- A greater understanding of the requirements of asbestos management allows more proportionate, sustainable and cost-effective solutions to be considered for decommissioning. The approach has been used to great effect in contributing to ONR’s assessment of the plans to move Bradwell into care and maintenance, and a holistic risk management approach is taken to balance conventional and nuclear safety risks and manage those risks proportionately.