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To whom it may concern,

# ONR’s Response – The Government’s Nuclear Regulatory Taskforce – Call for evidence

Thank you for the opportunity to comment as part of the Government’s Nuclear Regulatory Taskforce call for evidence to support its independent review of the UK nuclear framework and regulation.

This letter, and the attached appendix, provide the Office for Nuclear Regulation's (ONR) response to this consultation**.**  As per the call for evidence web page, we have also responded to each question using the online form.

Thank you again for consulting us and we would be very pleased to discuss any of our responses with you in more detail, as necessary.

Yours sincerely

**Rachel Grant**

Director of Strategy and Corporate Affairs

**1. What are the key challenges of the current regulatory system (including nuclear site licensing, regulatory justification, environment and planning to the extent relevant to nuclear development) across the nuclear plant lifecycle (for example design, build, operation, maintenance, decommissioning/disposal, waste management)?**

1) A clear strategic steer from government would help us significantly with prioritisation and enable maximum benefit and pace of deployment. We would welcome a strategic steer that would:

* Allow us to effectively prioritise our resource.
* Facilitate a programme approach to deployment of nuclear which allows benefits of replication to be realised.
* Provide a clear legal basis for strategic considerations such as energy security and national security to be applied to regulatory decision making.

2)We believe improved coordination and collaboration across domestic regulators would lead to efficiencies. The creation of a multi-agency framework, clearly setting out new build regulatory processes for new entrants could bring significant benefit. Regulatory decisions on safety, security, safeguards and environmental aspects could be optimised for the whole nuclear lifecycle through this approach.

We are committed to closer collaboration with the Environment Agency to expand joint working and build on initiatives, such as the joint programme management office (PMO) established for Generic Design Assessment (GDA), which has been successful and has clear potential for expansion.

3) A further challenge relates to export control legislation. The restrictions that apply to ONR on the exchange of information with other national regulators and the international supply chain can delay progress in assessment, hinder international collaboration, limit the potential for harmonisation regarding foreign nuclear reactor design acceptance and are a significant administrative burden.

Other national nuclear regulators freely share information with international government agencies and often cannot understand why the UK is not able to do the same.

A quick win would be for ONR to be granted a special licence to share Export-Controlled Information with international organisations and other national nuclear regulators for its regulatory purposes, to accelerate our decision-making and reduce or erase delays.

**2. What are the key benefits of the current regulatory system?**

The UK’s regulatory system has kept the public safe from the hazards of the nuclear industry for over half a century.

The UK’s goal setting, non-prescriptive and technology neutral regulatory framework provides flexibility to address risk in a proportionate way, supports innovation and adapts to emerging technologies without requiring legislative change. In other countries prescriptive regimes require changes to laws or rules to cater for new technologies.

It also ensures industry are accountable for demonstrating compliance with the law, controlling hazards, thereby ensuring industry ownership of safety outcomes.

ONR’s enabling regulation ensures a collaborative approach with industry and other relevant stakeholders to seek effective delivery against clear and prioritised safety and security outcomes. Enabling regulation means we are committed to risk-informed, well-targeted regulation that minimises costs, adding value and benefitting industry.

This collaborative approach has proved effective in reducing time and costs to industry and has delivered accelerated hazard and risk reduction. Our guide to enabling regulation illustrates this.

As well as being effective at regulating existing technologies, in compliance with international standards, the UK regulatory framework provides the flexibility to regulate novel and innovative technologies. This includes new reactor designs and artificial intelligence (AI) applications for which international standards either don’t exist or are not applicable. This is reflected in the number of early engagements and design assessment requests from industry we are supporting.

**Public confidence**

Evidence of our role in maintaining public confidence in nuclear can be found in our stakeholder survey results, the government’s Post Implementation Review undertaken in 2022 and international reviews.

In early 2024, the IAEA'S Integrated Regulatory Review Service’s follow-up mission, to evaluate the country’s regulatory infrastructure against required global safety standards, praised two specific areas of ONR ‘Good Performance’. Our Policy on Openness and Transparency, and the independent and transparent assessment of culture, commissioned by us and delivered by the Alliance Manchester Business School.

In a recent judgement (relating to a challenge against our granting a nuclear site licence for Sizewell C), a High Court judge described ONR as a highly expert regulator with extensive technical expertise and experience in regulating nuclear sites. The judgement referenced our clear and balanced considerations of challenges relating to sea defences and our licensing assessments were quoted in court which reinforced our strong arguments.

**3. How proportionate is the current regulatory burden to the risks involved in nuclear activities across all hazard / risk areas (for example, conventional safety, radiation safety, nuclear safety, environment, planning)?**

We are committed to risk-informed, well-targeted regulation and adapt our oversight in response to risk trends e.g. targeting high risk areas via themes identified in the Chief Nuclear Inspector’s Annual Report

Almost three-quarters (72%) of stakeholders agree that ONR acts in a way that is proportionate, and this is something that is consistent across sites and the levels at which people work. These figures are from the ONR’s 2024 stakeholder survey, which received 150 responses.

Overall, 80% agree that ONR considers ‘how far a dutyholder has fallen short of regulations when implementing safety and security guidance’, while 75% agree that ‘ONR’s enforcement actions are proportionate to the severity of the breaches they address’.

The outcome-based health and safety regulatory framework in the UK requires risks to be reduced So Far As Is Reasonably Practicable (SFAIRP) based on businesses assessment of both the risk and costs in taking measures to avoid that risk. The regulatory framework supports the identification of fit for purpose solutions but there is scope to work on improved understanding and interpretation. We are aware of examples where the interpretation of SFAIRP, by industry/regulators, has led to disproportionate outcomes and we have been working with government, industry and regulators to encourage proportionate implementation of the SFAIRP and Best Available Techniques legal requirements via the Nuclear Standards Forum.

At present, a nuclear site can only be delicensed once it meets the ‘no danger’ criteria; we have supported government work to make changes to the law. These proposed changes called Proportionate Regulatory Controls will allow nuclear sites in the final stages of decommissioning (or parts of sites) to be delicensed and excluded from the need for nuclear third-party liability cover much earlier by demonstrating that risk is comparable to other industrial sites. This means it can be regulated by the Health and Safety Executive (HSE) and the relevant environment agency.

The change would allow site operators to optimise site end states on a case by case basis. Based on data from the Nuclear Decommissioning Authority (NDA) and site licence companies, the largest savings from this change would come from reduced costs for land remediation, transport and disposal of waste. These savings would be expected to accrue shortly after the changes are made.

While the nuclear site licence is in place, it is extremely difficult to use the site for any other purpose. Once the nuclear licence is surrendered, the site operator may apply for planning permission to allow the site to be used for recreational, commercial or other purposes. Thus, a secondary benefit from this step is that it will allow former nuclear sites to be re-used earlier.

Our guidance on delicensing has been developed in full consultation with the NDA and other regulators and is ready to implement when the legislative changes are made.

**4. How well adapted is regulation to support the deployment of advanced and innovative nuclear technologies (such as SMRs and AMRs) and what needs to change?**

Our assessment principles are ‘technology neutral’ and applied to the regulation of all nuclear facilities in Great Britain. Without such a regime, new prescriptive requirements and standards would be required for each different type of innovative technology. This flexible regulatory environment supports the introduction of innovative technologies, while catering for their effective and proportionate regulation. Companies have told us that our goal-setting framework is a key reason for looking to deploy first-of-a-kind technology in the UK, as more prescriptive ‘rules based’ regimes are more restrictive.

The benefits of risk informed regulation are increasingly recognised internationally. The Nuclear Regulatory Commission in the United States, whose regulations are specific to light water reactor technology, have similarly recently developed a new [risk informed, technology-inclusive framework for advanced reactors](https://www.nrc.gov/reactors/new-reactors/advanced/modernizing/rulemaking/part-53.html).

Through our work on the government funded Advanced Nuclear Technologies programme, we have developed the capability to be ready to regulate novel technologies.

ONR, the Environment Agency and Natural Resources Wales have developed a flexible early engagement process. Providing advice and guidance to vendors and developers on the reactor design and the potential pathways through regulatory processes. Since launching, we have engaged with five companies. One of these is now in the nuclear site licensing process and another has applied for GDA, while another two have signalled their intent to apply at a later point. **This demonstrates that the process is achieving its aim of enabling organisations to make meaningful progress through regulatory processes.**

The GDA process was developed in response to the government’s 2006 energy review, which recommended regulators put in place a ‘pre-licensing design authorisation process’. The significant benefit of GDA is that it de-risks deployment, it keeps assessment of the reactor design off the critical path for construction, significantly reducing cost and schedule risk.

GDA encourages international collaboration, facilitating the global deployment of new reactor designs. **We are** **committed to, and are already collaborating with international regulatory bodies, to facilitate global deployment of standard reactor designs** and reduce the burden on industry, through reduced costs and streamlined processes. We recently published our [first report on international collaboration](https://www.onr.org.uk/media/eonhdvop/international-regulatory-collaboration-on-new-reactor-designs-quarterly-update-march-2025.docx) detailing the significant progress we have made.

Within the regulatory system which includes licensing, permitting, justification and planning, there is great flexibility and no prescribed ‘one way’ of navigating through it. For example, if a site and a developer are available then design assessment can be run in parallel with licensing. Our guidance makes clear that a fully developed ‘site specific’ safety case is not required at the point of licence grant.

**5. Do you have evidence of where duty holders’ and regulatory organisations approaches to regulatory obligations, processes and good practice, including safety culture, caused undue delays or barriers to project delivery?**

1) Safety culture

In our experience, there have been delays or barriers due to issues with safety culture and we have sought to remove these through our enabling approach.

The Sellafield G6 approach to achieving hazard and risk reduction came from stakeholders' tendencies (including ONR) to 'gold plate' engineered solutions and safety case submissions.

Historically (90s and 00s), in response to events and regulatory findings, the site and ONR had become too bureaucratic, and at times, overly conservative and risk averse. Leading to less than optimum solutions to major hazard and risk challenges on the site.

To solve this, 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. 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.

Subsequently, risk and hazard reduction has progressed 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 also been reduced substantially.

The “G6 approach” has become a trademark term used to promote and encourage collaboration and innovative thinking, the adoption of fit for purpose solutions and a focus on early delivery of projects at Sellafield. Similar enabling approaches have been adopted at Dounreay, Devonport and Aldermaston.

2) Relevant Good practice (RGP)

A key element of the regulatory framework is the concept of RGP, to reduce time and effort in commonly encountered situations, where there is already well-established good practice. We work hard to ensure our inspectors and industry apply good practice that is relevant to the situation but at times there have been misunderstandings on the interpretation.

We continue to work on the interpretation and application of our regulatory framework. We provide training and guidance to our inspectors, we work with industry and other regulators to improve our capability and that of industry, so that submissions and decisions are proportionate and cost-effective. We recognise that this is an area where there is always more work to do.

3) Cost benefit analysis

The outcome-based regulatory framework in the UK gives industry the opportunity to weigh up the costs and benefits and propose solutions that work for them. However, there is an opportunity for the industry and ONR to work better together when considering the cost and benefits of risk reduction measures, and consider the optimum solution to achieving the required safety standard.

**6. Do you have evidence of where current regulatory processes enable innovation?**

The UK regulatory framework can easily accommodate new technologies such as AI and we have evidence of where our processes enable innovation as follows:

Working with the Environment Agency, ONR has developed a set of pathways for the UK nuclear industry to engage with regulators to discuss innovative solutions. This supports accelerating deployment of these solutions in active applications and helps us to develop the regulatory framework to support the assessment of new technologies.

We undertook the world’s first regulatory sandboxing on AI within the nuclear industry which was used by Sellafield as a key part of the development of an AI-based, computer vision system, for high hazard and risk reduction. This has the potential to generate cost efficiencies of more than £100m.

We have worked with industry on robotics and drones, which has accelerated the deployment of mobile robotics in active applications at Sellafield and on the NDA estate and has saved workers from exposure to significant levels of radiation.

We have worked internationally, firstly on a position paper with peer regulators which is recognised as being in the vanguard in establishing principles to support safe and secure deployment of AI in nuclear applications. We have also set up an international agreement with six other regulators using regulatory sandboxing to promote harmonisation and consensus in key areas of innovation.

We are working to adopt and scale AI solutions at pace to support faster, consistent and more efficient regulation and support drone and virtual technologies for training, familiarisation, inspection and surveillance activities.

We are using AI to simplify regulatory guidance documents, support the Communications Team, support knowledge manage capability and to generate and assess safety cases. We have invested in a modern and flexible IT capability to securely exchange information with industry and exploit new technology.

During the last year, ONR has worked in partnership with industry leading, cyber security specialists Dragos to author a white paper exploring emerging cyber risks. The paper supports industry in making risk informed decisions when considering emerging technologies and innovations such as AI and Quantum.

Our open-minded and enabling approach has seen various new and innovative solutions adopted by industry e.g. in relation to consolidation of special nuclear material from Dounreay to Sellafield and the US and our work supporting the Ministry of Defence and Devonport Royal Dockyard Ltd on the development and utilisation of the Integrated Plant & Site Justification.

**7. Do you have evidence of whether the current interaction between industry and regulators at different working levels helps or hinders achieving clear, timely, and effective outcomes?**

Evidence that current interactions between industry and regulators help achieve outcomes includes:

Our enabling approach is widely recognised as delivering effective outcomes throughout the nuclear lifecycle, with numerous examples over the last 10 years.

Our early and open interaction with industry allows testing of understanding to ensure expectations are understood and responses are proportionate. Without this there is increased risk that submissions will not meet expectations first time, leading to delays in regulatory decisions and increased cost to industry.

Our enabling regulation of the supply chain has improved management arrangements, which reduces risks associated with counterfeit, fraudulent and suspect items, which in high profile instances, such as the issue with material certification at Creusot forge, can result in costs of millions of pounds. We are part of a long-term, international regulatory collaboration on supply chain which has developed common approaches to assessment of suppliers. We have taken part in multinational regulatory inspections of high-risk suppliers, which have identified significant shortfalls, developed corrective action plans and reduced project risks.

In the stakeholder survey, 82% of respondents said ONR influences improvement in safety and security culture in the nuclear industry as a whole.

There are some areas which can hinder effective delivery:

**We have a significant volume of guidance** which feedback tells us is instructive, but we are working to make this simpler and easier for new market entrants to understand. We need to simplify and streamline, removing unnecessary complexity and volume. This will promote better understanding, and ease of adoption of the good practice they highlight by our inspectors and industry.

**The production of safety cases can be seen as a cottage industry**, with elements of the supply chain incentivised to make safety cases more complicated than they need to be. We have noted the misunderstanding captured in the 2020 National Audit Office report on Managing Infrastructure Projects on Nuclear-Regulated Sites that the purpose of a safety case is to satisfy the regulator rather than to act as the basis for safe operations.

**The lack of design** stabilityis one of the biggest influences on the duration of GDA and being able to determine the acceptability of a design. **We recognise this and are looking to build a more substantial link between design stability and progress through GDA, to ensure expectations are understood from the outset.**

Furthermore, the risk of a lengthy hiatus in regulatory engagement while development companies are being established means that design developments during that period would need to be subject to regulatory scrutiny – this creates the risk of rework being required if expectations are not met.

**8. Are there best practices from other sectors / nations that are relevant?**

**Funding models**

We have compared our charging and funding model to other domestic and international comparator organisations and are in the process of determining a new funding strategy that improves the flexibility of our funding model, to ensure we are able to invest and remain fit for the future. The current funding model requires us to operate within a complex legislative and rules based framework. However, while some flexibility exists, the model does not allow us to carry reserves and re-invest monies in innovation and continuous improvement, and promote agility in the face of a dynamic environment.

Domestically, UK regulators take varying approaches including blending regulatory charging and commercial charging with a permitted return on capital and being fully funded by grants and/or sponsored by government. Internationally, there are various funding mechanisms including cost recovery, fees from licensing, special project fees and being fully funded by the state.

**Prioritisation of new nuclear projects**

The Canadian Nuclear Safety Commission has put in place a process for prioritising entry to its pre-licensing process, to ensure priority is given to projects which are likely to become “part of a future reactor deployment”. This process includes consideration of the following factors:

* a demonstrated partnership between the vendor and an existing utility (potential applicant), with a formal commitment with the vendor to build its design in Canada
* a signal from the Government of Canada, made in consultation with provincial stakeholders, that a review of a reactor design is in the national interest (includes technology development funding)

In our opinion, a similar prioritisation process for the UK would ensure that deployment of regulatory resource can be optimised on priority projects and we would welcome engagement with the department to put such a policy in place.

**9. Do you have any additional evidence to share?)We are interested in views on whether this captures the relevant regulatory domain and, if not, what other regulation might need to be in scope.**

**Fleet approach**

The greatest efficiency benefits for new nuclear projects can be realised by deploying fleets of the same reactor design. While the requirement to reduce risks remains the same, provided timescales are reasonable and a suitable case can be made, a previous ‘as-built’ plant can serve as the basis for the next-to-be-built plant, taking account of operational experience from previous deployments to improve processes and optimise designs. The benefits of a fleet approach to deployment of EPR technology, which we supported fully, are being realised at both Hinkley Point C and Sizewell C. For example:

* We have been informed that Hinkley Point C has seen major reductions in component defects compared to Flamanville 3, while at the same time achieving significant reduction in component build times.
* We are aware that Hinkley Point C unit 2 will achieve significant schedule reductions compared to unit 1.
* Sizewell C will replicate the design, licensee arrangements and supply chains as Hinkley Point C.
* There has been significant increased use of modularised build at Sizewell C compared to Hinkley Point C.

We recognise the benefits of a fleet approach and have developed a regulatory strategy for replication at Sizewell C, as well as including new guidance on replication for our inspectors.

Should a developer seek to deploy a mature technology in the UK that is already deployed in another country, we would optimise our assessment process as much as possible, utilising regulatory assessments and approvals done by other national regulators to inform our own decision to approve the design for the UK.

**Time and resource to address multiple stages of appeal processes**

We are supportive of government policy proposals to reduce the number of appeal stages for judicial review of infrastructure decisions. To illustrate, this would mean that the current appeal stage against our decision to grant a nuclear site licence for Sizewell C would not be underway.

Our recent experience of the planning system is that the current National Planning Policy framework is insufficient for ONR to effectively deliver the government’s policy for the control of population around nuclear licensed sites. Decision-makers are not guided as to ONR’s role in the planning system and as a result there are instances when our advice has not been acted upon.

Decisions taken against ONR’s advice potentially undermine the safety of the public living in the vicinity of nuclear installations and repeated explanations of ONR’s role in appeals and examinations represents an inefficient use of public funds.

We would be keen for further government policy and legislation on developments within the detailed emergency planning zone, as without this, such appeals will keep arising.

**Justification**

Before any new class or type of practice involving ionising radiation can be introduced in the UK, the Department for Environment, Food and Rural Affairs must assess it to determine whether the individual or societal benefit outweighs the health detriment it may cause.

The Secretary of State previously determined that each new nuclear power plant design is a new type or class of practice for the purposes of Justification. For a new class or type of practice in the nuclear sector typically this takes around two years. Grouping technologies may alleviate some of the requirements and effort required, without needing the amendment of the existing legislation. Our view is that research could be undertaken to determine whether similar reactor technologies could be categorised into groups of justified classes or practices.

**Novel uses of reactor technology**

We welcome further engagement with government to provide clarity on legislation for the novel uses of reactor technology, e.g. UK civilian maritime (nuclear-powered civilian ships, floating nuclear power plants), transportable reactors and reactors in the use of UK space activities.

Under the Nuclear Installations Act 1965, installing or operating “a nuclear reactor comprised in a means of transport” does not require a nuclear site licence. Under current legislation ONR would therefore have no vires for the regulation of safety of ‘at sea’ reactors used for maritime propulsion. This is covered instead by the Merchant Shipping (Nuclear Ships) Regulations 2022, enforced by the Maritime and Coastguard Agency.

Similarly, it is unclear how the current legislation would be applied to the regulation of transportable nuclear reactors and if this would be covered by existing domestic and international transport requirements. Amendments to the Nuclear Installations Act 1965 give ONR the power to regulate sites “situated wholly or partly in or under the territorial sea adjacent to the United Kingdom”, but it is not clear which body would be responsible for regulation of transportable reactors while in transit.

Furthermore, we understand there are also plans for UK companies to engage in activities utilising reactors for propulsion in space (for deep space missions) or reactors to power a base, for example on the Moon. Work is required to understand gaps in nuclear safety legislation and overlaps in the legislation of UK space activities which is regulated by the Civil Aviation Authority.