

- 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)?
 - Complexity of the regulatory environment, where there are multiple regulators with interlinked responsibilities (e.g. Environment Agency (EA)/Scottish Environmental Protection Agency (SEPA)/Natural Resources Wales (NRW)/Office for Nuclear Regulation (ONR)/Planning Inspectorate (PINS) etc). The effect of this is a degree of regulatory fragmentation, and the need to seek permits and permissions across dozens of different regulatory regimes (each of which is fundamentally different);
 - Whilst the regulatory framework broadly works, it is very slow to act. This can add significant cost, delays and uncertainty to operators and potential operators' future activities.
 - Not all regulators are proportionate in their application of the regulations (which, in some cases, is because the regulations are prescriptive where they do not need to be).
 - The availability of routes of vexatious legal challenge, to purposefully delay and obstruct beneficial developments, can be a real challenge for the industry.
 - The devolved nature of some relevant regulatory bodies (particularly the environment agencies) has led to fundamentally different approaches and attitudes to the same or equivalent issues, most notably between Scotland and England. This means that operators that operate in both countries (e.g. EDF) can find it difficult to steer their way through regulatory issues that are being addressed inconsistently across the border.
 - Projects should account for their national importance. For example, it was indicated by PINS that the Wylfa Development Consent Order (DCO) would have been rejected due to concerns over potential effects on seabirds. This appears to be at odds with the addition of several GW of zero carbon generation to help prevent catastrophic climate change.

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

One of the key advantages of the current regulatory system is that it is mostly objective setting. This means that duty holders should be able to determine how best to meet the requirements of the law in a way that suits their own businesses. However, some aspects of law are prescriptive and inflexible, sometimes for no apparent reason. This means that the current regulatory systems sometimes struggle to accommodate innovation and experimentation.

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)?

The regulatory framework itself is, for the most part, proportionate (potentially with the exception of some of the environmental regulations). However, there are instances of regulators applying the regulatory framework in practice in a way that is disproportionate to the level of risk involved. In particular, the concepts of So Far As Is Reasonably Practicable (SFAIRP) (Safety) and Best Available Tools/Technology (BAT) (Environment) are sometimes interpreted in a manner that is narrower that the underlying law probably requires or intended them to be. Hence, it is often held that neither national strategic issues nor affordability can be taken into account in such decisions (although cost can be). At the micro level, this makes some sense, but at the macro national infrastructure level, particularly in today's economic environment, this can drive unnecessary 'gold plating'. The use of As Low As Reasonably Practicable (ALARP) has driven a number of costly modifications to 'standard plants' bought into the UK with questionable overall benefit.

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?

Much of the relevant regulation is sufficiently flexible to deal with new technologies. However, significant concerns exist over how the planning system works in the UK and some of the environmental considerations that appear insufficiently flexible or pragmatic given the low level of risk presented by some new technologies. The Semi Urban Planning criteria is a good example that does not appear to have kept pace with developments and will likely limit the deployment of advanced nuclear near to centres of demand where it is needed.

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?

Regulators tend to be more conservative and risk averse by their nature than others might be. This can lead to a reluctance to embrace new approaches or innovations. Whilst guidance and regulators opinions on good practice are



often helpful, excessive guidance can be viewed as prescription 'by the back door' for regulatory regimes that are meant to be objective setting and flexible. This is often down to how they are perceived by duty holders or used by regulators themselves. This can inhibit innovation and, in some cases, discourage duty holders from even suggesting innovation. It is also important that regulatory fragmentation (i.e. where different regulatory regimes act incoherently in a common context) is identified and eliminated. Previous Generic Design Assessments (GDA) have led to a number of design changes in standard plants which have added cost, complexity and time to the schedule. This indicates that a drive towards harmonisation is required. The NI fully supports a measure of regulatory harmonisation but it is somewhat telling that there was not one single driver but rather several different entities undertaking 'regulatory harmonisation' initiatives.

Currently a majority of developers have favoured or use Town and Country Planning Act applications (TCPA) to permission early investigative works in advance of a Nationally Significant Infrastructure Project (NSIP) to be permissioned by DCO. It is possible that a local authority could stall development of a NSIP by refusing such planning permission. This occurred in the Bradwell B Project when the local authority, Maldon Council, refused planning permission for ground investigation work, causing over 12 months delay to the project.

The need for each entity to consult publicly, and in some agencies' cases (such as the Environment Agency on every permit and interaction) provides unnecessary delay and increased cost. For a NSIP, the public could be asked to take part in a public consultation 5 – 10 times on different aspects for one project. This is likely to be counterproductive and reduce public engagement through 'consultation fatigue'. A single, sustained consultation for the entire project would likely be more appropriate and ensure more meaningful results whilst reducing cost, risk and schedule duration for the developer.

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

Current regulatory processes have been effective, to some degree, in enabling robotics and modern data science (including the adoption of Artificial Intelligence (AI)) within the nuclear sector. However, the pace with which regulators adopt AI themselves casts a shadow (positive or negative) on the willingness of duty holders to do similar. Regulators should be taking more of a leadership role in this regard.

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?

The alignment of regulators and duty holders towards addressing the high hazard legacy facilities at Sellafield is an example of where the organisations have been able to work together to a positive outcome of national importance. However, it is sometimes the case that agreements reached at senior level do not translate into equivalent agreements at the working level. This can lead to uncertainty and a lack of coherency in driving progress. There have been instances, for example, where the Environment Agency and ONR have not aligned sufficiently to allow the resolution of issues in a mutually agreeable way.

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

The proactive and progressive use of data science in the oil and gas industry (and road and rail sector) has allowed for far more targeted regulation that is typically seen in the nuclear industry. As similar data processes have not yet been adopted by most nuclear regulators in the UK, some regulatory activities are driven by perception of risk (rather than actual risk), bias based on previous experiences, distrust, or past 'custom and practice'. This can impose unnecessary regulatory burdens on the nuclear industry, in contradiction to the requirements of the Regulators Code, and act against the growth agenda. It would be helpful for all nuclear regulators to be encouraged to make better decisions using modern data science and the vast amounts of information that they hold. It would also be helpful for nuclear regulators to be subject to regular democratic scrutiny of their activities and approaches to ensure that they continue to serve the best interests of the UK, while discharging the statutory purposes in an efficient and effective way.

9. Do you have any additional evidence to share?

It is evident that a number of regulators in the nuclear sector are taking steps to modernise and improve the efficiency of their regulation whilst eliminating unnecessary regulatory burden on duty holders. However, the pace at which this is being done is potentially too slow to meet the near- and medium-term needs of a nuclear renaissance.

The process of Regulatory Justification under the Justification of Practices Involving Ionising Radiation Act, 2014 is a cumbersome requirement that could easily be rolled into either the GDA or Nuclear Site Licensing process, removing significant cost, schedule delays and risk for developers with very little change required to legislation.