NUCLEAR PM SIG

INSIGHTS REPORT NO. 1

Why Nuclear Projects Suffer from Poor Predictability

An APM and NI joint initiative

apm association for project management

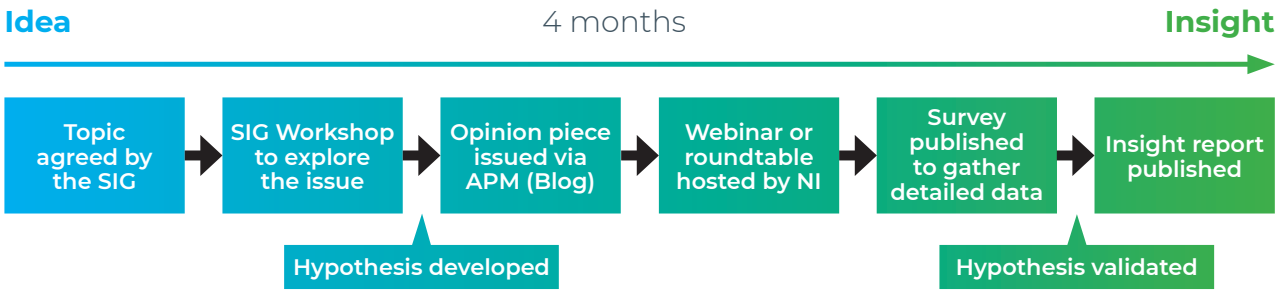
THE CHARTERED BODY FOR THE PROJECT PROFESSION

the nuclear institute

Nuclear PM SIG Insights Report Series

This Insights Report has been produced by the Nuclear Project Management Specific Interest Group (SIG), a joint initiative between the Association for Project Management (APM) and the Nuclear Institute. The group, formed in March 2019, is seeking to improve the capability and performance of project, programme and portfolio management within the nuclear industry, with a view to enhancing the competitiveness of the nuclear industry. A core part of the SIG's strategy is to seek, identify, study and solve key issues pertaining to the successful delivery of projects, programmes and portfolios that are present within the wider nuclear sector and organisations (both public and private) acting within it.

The Nuclear PM SIG will be issuing a series of Insights Reports which are the product of several months research each. The underlying research has been conducted by the SIG through discussions with industry stakeholders, structured workshops, feedback gathered following shorter thought leadership pieces and finally a survey that gathered specific data on the issue being investigated. The general process for each Insights Report is shown below:



This report represents the progress and findings of a project focused on investigating the lack of predictability in projects within the industry, and the impact this has on investor confidence.

The next report in the series will examine the impact of nuclear safety culture on effective project delivery.

Cover image: Horizon's proposed power station at Wyfla Newydd https://flic.kr/p/qvUVCW

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FOREWORD

The success of our nuclear sector has become increasingly important as we seek to meet the demand for clean, sustainable energy and fight the challenges of climate change now and in the future. Delivering project success with greater speed, agility and certainty has become critical to the sector, as it has across all areas of project delivery. The valuable contribution that project professionals make to these global challenges cannot be overstated, reflected by a profession willing to challenge itself to achieve ongoing improvement and greater success. APM, as the chartered body for the project profession, is delighted to be working with the Nuclear Institute to develop capability in the nuclear sector and address key issues that affect us all. We would like to thank the members of the NI Project Management SIG and everyone who has engaged in the work surrounding predictability in decision making that has allowed us to produce this valuable report which we hope will continue to stimulate further debate across the profession. We would encourage all professionals to engage in these discussions to meet our future challenges and deliver more project success.

Debbie Dore, CEO, APM

Wylfa Nuclear Power Station, Anglesea, Wales - Decommissioned in 2015
Photo: David Dixon

Nuclear projects are amongst the largest and longest of key infrastructure projects, particularly those in the energy space and ones that have the ability to have such a huge impact on our progress to a net zero world. Whether we are thinking of new build, decommissioning or waste management projects they are also amongst the most complex. Nuclear people are highly trained in the technical and safety of such projects but the management of them is also fundamental to their success. The work of this Project Management Special Interest Group that brings together these two skillsets is hugely valuable to the industry. This report will help the understanding and learning of professionals engaged in this work and we urge you to get involved with future work of this type. The NI is grateful to the members of both APM and NI for their contributions to the report – it is their experience and commitment that has made it possible.

Sarah Beacock, CEO, NI

Barakah nuclear power plant under construction in 2017. Photo by Wikiemirati.

THE PROBLEM

On 15 September last year Hitachi finally pulled out of the Wylfa project to build a nuclear power station on the island of Anglesey and in March of this year (2021) they will close its Horizon subsidiary. The decision marks the latest in a depressing list of nuclear projects which either never see the finishing line or are suspended for long periods whilst funding routes are debated. Over the longer term this has had a corrosive effect on the sector's reputation to deliver high-profile projects, which in the past has seen milestone making successes such as the world's first civil nuclear power station; the development of gas cooled graphite technology; the first controlled release of fusion power, and perhaps most importantly, an enviable safety record: be it a power reactor or a propulsion reactor.

We can foresee similar milestones in the future with the new fusion programme at Culham and Rolls-Royce's pursuit of smaller, more economical reactor designs. However, right now we seem to be stuck in a start-stop cycle of design and construction, which leaves us as a nation seeing a gradual run down of nuclear output until we reach a point where we might be left with just one operating nuclear power station until Hinkley Point C comes on-line. Where our zero carbon electricity is going to come from without the nuclear contribution during those dark winter days when demand is at its highest remains unclear.

In this Insights Report we review the challenge of improving the predictability of nuclear projects and associated investor confidence. As part of our study, we asked a group of project professionals and nuclear industry practitioners for their thoughts on the ability of the UK to deliver new nuclear power stations to time and cost. The results are shown in Figure 1.. You can see that no-one felt these projects were predictable and 80% of respondents thought they could be characterised as late and over budget.

The government's welcome desire to push the low carbon agenda and accelerate the move to zero carbon transport and heating makes it all the more important that we deliver future nuclear projects in a predictable way. All other available power sources can only provide a partial solution to the challenge; being either carbon fuelled or intermittent in nature.

Hinkley Point. Photo by Andrew Bone. https://flic.kr/p/2jvxY76

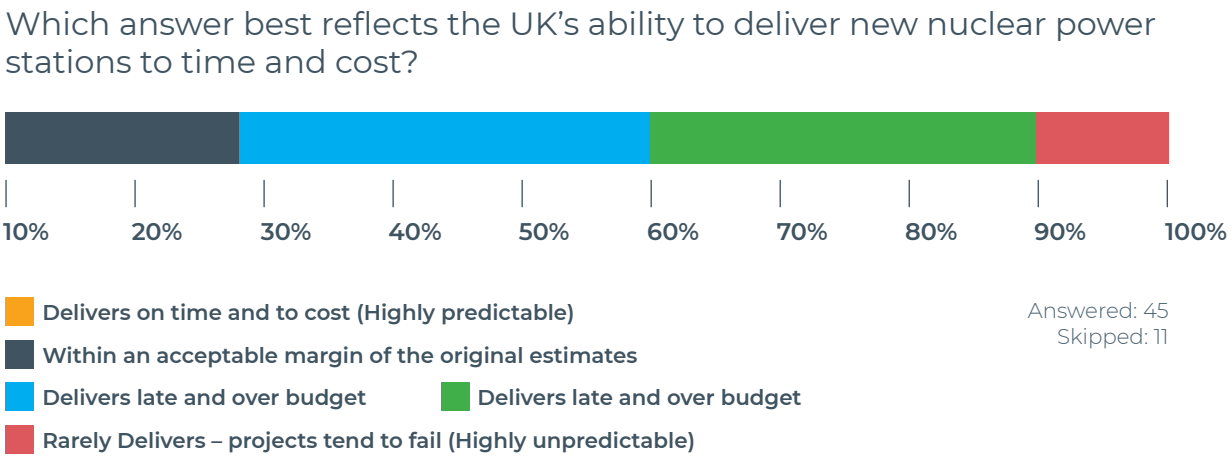

Figure 1: Survey response on UK ability to deliver nuclear projects

The focus of our study was to identify the root causes of the unpredictability in nuclear project delivery and to what extent that affects investor confidence. The results of the survey in Figure 2 (backed up by a poll conducted on the Nuclear PM SIG webinar suggests almost all the respondents felt that project predictability was a major factor in building investor confidence. Interestingly, there was a strong view from the investors that we spoke to that as a sustainable form of energy, nuclear was very attractive to investment companies who were looking to strengthen their Environmental, Social and Governance (ESG) strategy in response to pressure from their shareholders. Project predictability was important but the balance a positive ESG investment gives to their portfolio was at least equally important.

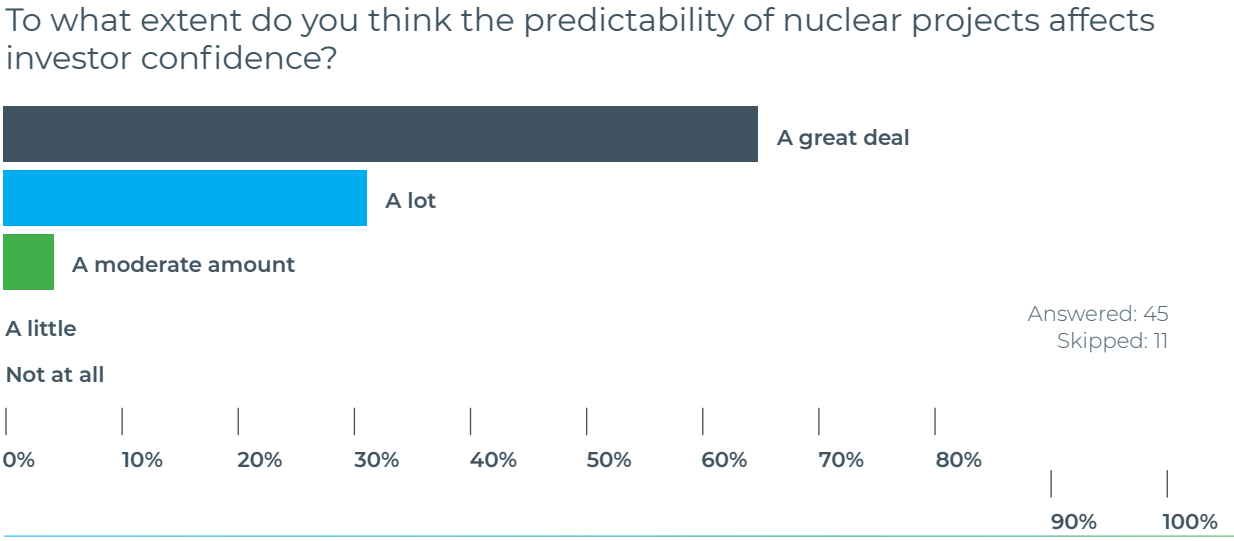

Figure 2: Survey response on investor confidence

THE HYPOTHESIS

In order to develop insight into this issue we have adopted an approach based on a number of stages:

1. Internal review and debate in the Nuclear PM SIG leading to the development of a hypothesis. Most of the major UK nuclear organisations were involved in this debate.
2. Publication of a blog via the APM website to engage with project management professionals and create a social dialogue via LinkedIn. There were several thousand combined hits to this blog and a wide range of comments. We also spoke to two representatives from the investment community to get their thoughts.
3. Delivery of a webinar via the Nuclear Institute platform and jointly promoted with APM to engage with a mixed group of project and nuclear professionals. Some survey data was obtained via this medium, together with an open Q&A session. Around 60 people joined the webinar.
4. Survey of project and nuclear professionals via the Survey Monkey platform to obtain the views of an informed professional group of insiders. Again around 60 responses were received from this survey and the results are discussed below.
5. This Insights paper to report the finding of the study and potential next steps.

Bringing together this combined thinking of project management representatives from most of the nuclear operators and constructors in the UK, the investment community, together with subject matter experts from consultancy and academia, we have narrowed our focus to one issue that we think is a serious problem and consistently impacts the predictability of nuclear projects: the speed of decision making.

To predictably deliver, projects need to be able to implement risk mitigations or realise opportunities before the mitigation or opportunity window closes. That means there is a *critical decision making time*. This is shown in Figure 3:

If, on average, decisions take longer to make than this critical time, then it will be too late to mitigate the threat or take advantage of the opportunity. Another way of looking at it is if the average decision making time is rapid, then there are more available risk mitigation options or opportunities that you can take advantage of. This leads to our hypothesis:

Complex nuclear projects need timely decision making to be successful but slow governance inherent in western nuclear projects makes this challenging. This is a major inhibitor to predictability and market-competitive time and cost performance.

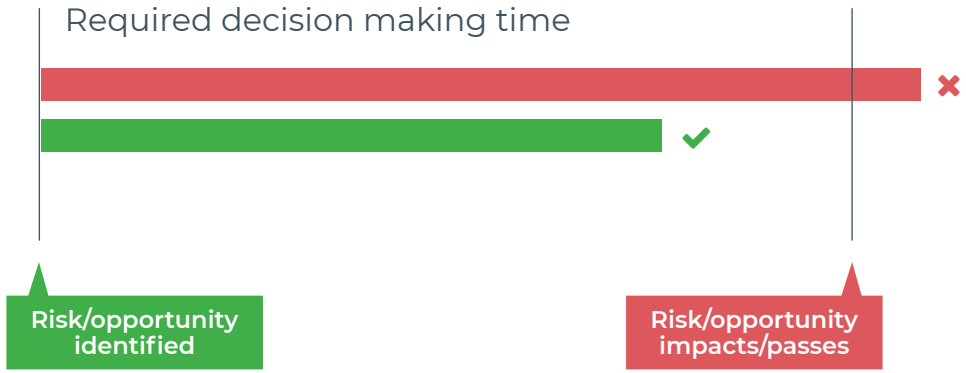

Figure 3: Decision making window

In this paper we'll summarise the results of our research. We'll review progress on existing projects and examine the hypothesis in detail. We'll explore some of the specific issues that influence nuclear projects that are to some extent unique to either the nuclear industry or the UK (or perhaps the western world). There's a healthy contribution from academics and from those whose role is to examine performance of projects of public interest and we'll see what evidence they've uncovered. We delve deeper into the potential root cause that the SIG has identified, i.e. the speed of decision making in the nuclear sector and we'll examine the impact this has on predictability and associated consequences. We'll conclude by outlining recommendations to address this issue. Most of the nuclear operators and site license companies are members of the SIG, so we have a direct line to implementing it on an existing or planned project. However, some of the issues we uncover would require Government intervention as aspects of economic and safety regulation are identified as factors in the speed of decision making.

The rationale for the hypothesis

In 2008 EDF announced that it would be building a new design of nuclear reactor at Hinkley Point C (HPC) in Somerset. In the following year the United Arab Emirates (UAE) newly established Emirates Nuclear Energy Company (ENEC) selected the Korean contractor Kepco to design and build its first four nuclear reactors at Barakah in Abu Dhabi. The UK press have kept us well briefed on the ups and downs of Hinkley Point C (HPC) – currently very much on an up – but many people are not as aware of the progress ENEC has made in the UAE. On 19th August 2020 Barakah 1 synchronised to the grid. A great achievement: 11 years from selecting the design and build contractor to generating nuclear electricity. Incidentally EDF's first estimate for HPC was for a nine-year design and build with our 2017 Christmas turkeys famously to be roasted using nuclear power from the power station. That will now probably be around 10 years later.

We would be very pleased with the 11 year duration that the UAE achieved. And that's with our 60 years of nuclear experience, 100,000 nuclear professionals, an established regulatory system and a substantial supply chain and infrastructure. So, how did a country with no nuclear heritage, no nuclear engineers, no regulator and no supply chain achieve it? Some might argue that the UAE was successful because they brought Kepco on board: the successful builder of a series of on-time and on-budget nuclear power stations in Korea. If that's true then why couldn't Hitachi repeat that trick at Wylfa with their similar track record in Japan and Taiwan? These are complex questions that deserve careful examination.

Figure 4: Barakah 1 synchronises to the grid

One thing we know about the UAE is that there was clear, consistent strategic direction from the very top. The intent is to build eight reactors on the Barakah site and that is probably what will happen. They're well on the way with the first four and they'll start the next phase in the next few years. In the UK, at least in recent times, our energy strategy has consistently been clear that nuclear energy is a key part of the low carbon energy mix and right now there's no other option for low carbon baseload electricity. We don't officially use the term baseload anymore, but all electricity systems need an always on component that isn't subject to sudden drops in output or frequency. Wind and solar can't deliver that always on element and decarbonisation of gas plants isn't a proven

technology. Maybe batteries will help, but right now we don't require new wind farms to be built with battery back-up, which is one reason they are so cost effective compared to other energy sources. For effective baseload capacity, equivalent to a nuclear power station, the battery farms would need to be the size of a large city … to power a large city. But despite the apparent benefits of nuclear power and the Government's continual reaffirmation of its intent to deliver it, there appears to be little overall confidence in the continuity of investment to deliver and deal with issues that arise during the project.

Comparison with other countries

In the survey, see Figure 5, we asked how well people felt UK nuclear performance compared with the best international comparator for delivery of projects. Whilst a significant number felt that it compared reasonably well, no one thought that UK performance was better, and a significant number felt it was worse.

There is useful publicly available information that compares western and eastern nuclear project delivery performance. This reinforces the view from our survey and in fact suggests it is probably worse. Figure 6, below, shows the data for the Korean programme. The learning curve is clear to see with construction times improving due to the continual nature of the build programme. The equivalent western curve from the same source shows no learning and even possible divergence. In fact (noting that no western project has yet reached completion), the Korean build duration is about half that currently forecast for western projects. Figure 7 shows the financial impact of these delays. Perhaps the most striking comparison is that the interest charge for a US and European project would pay for the entire construction of a Korean power station. It could be argued that the relative interest charge is a reasonable measure of unpredictability.

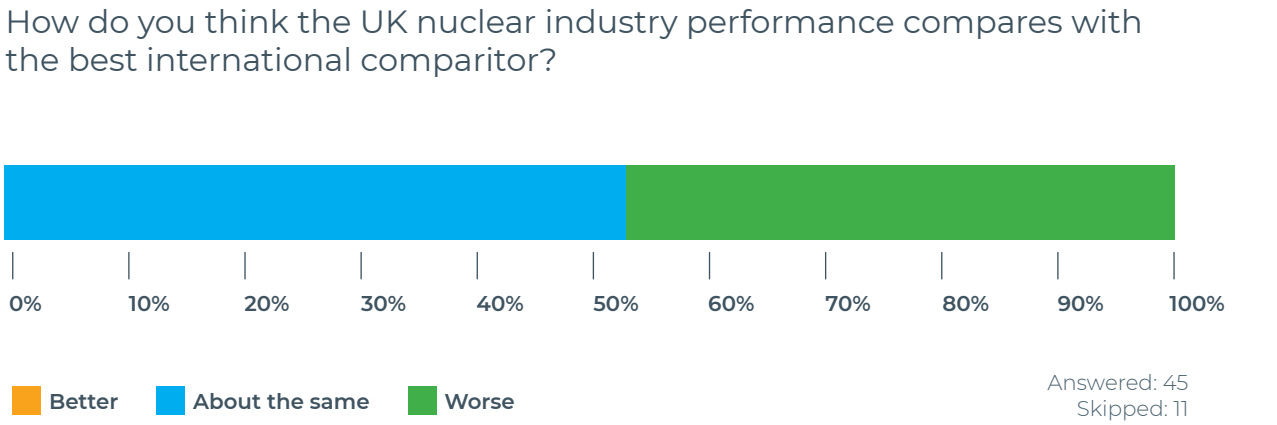

Figure 5: UK global comparisons

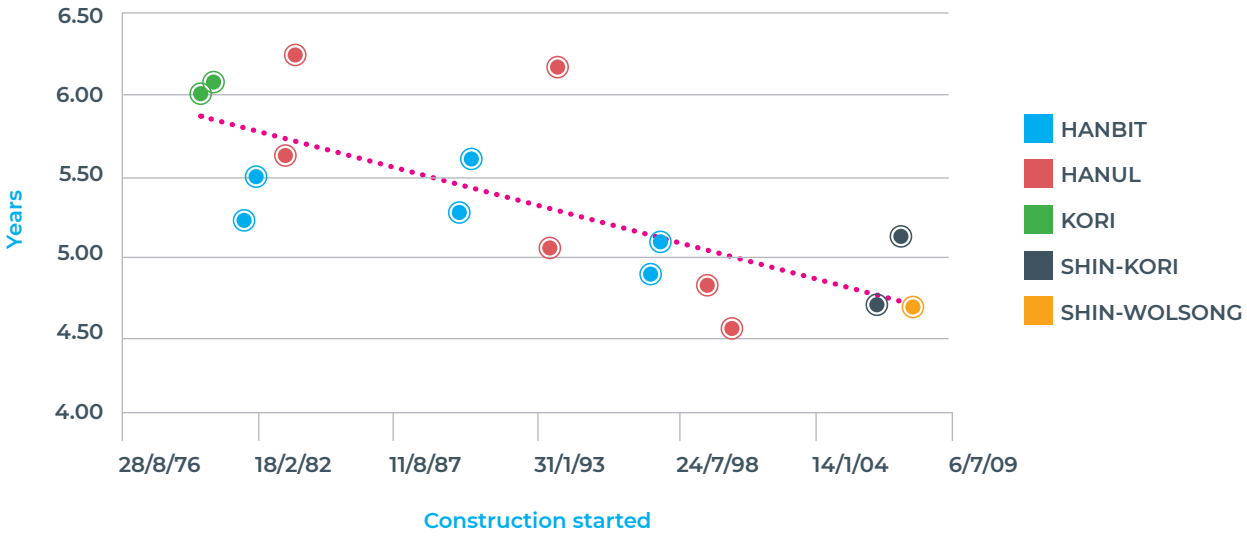

Figure 6: Korean new build improved performance

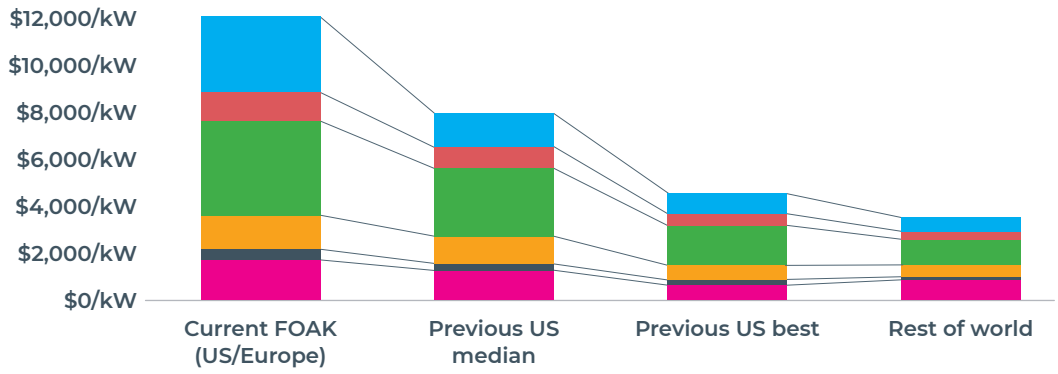

Figure 7: Global comparison of new build costs

The Impact of decision making on predictability

In the survey we also asked industry insiders what they thought the key reasons were for the unpredictability of nuclear projects. The results shown in Figure 8 confirm that the speed of decision making is perceived to be a critical factor. It was perceived to be the most important factor alongside political will.

We recognise that decision making and governance is only one root cause of poor predictability and we haven't ignored the others. However, it's the one we've chosen to focus on and the reasons for that we'll explore next. More than any other root cause it appears to be different in the west compared to the East and it has a number of features that are specific to the nuclear industry. To explore this further we developed the hypothesis to be tested.

There have been a number of NAO and Government Committee reviews into the nuclear programme which have identified the impact of decision making on predictability and investor confidence, most notably the Energy and Climate Change

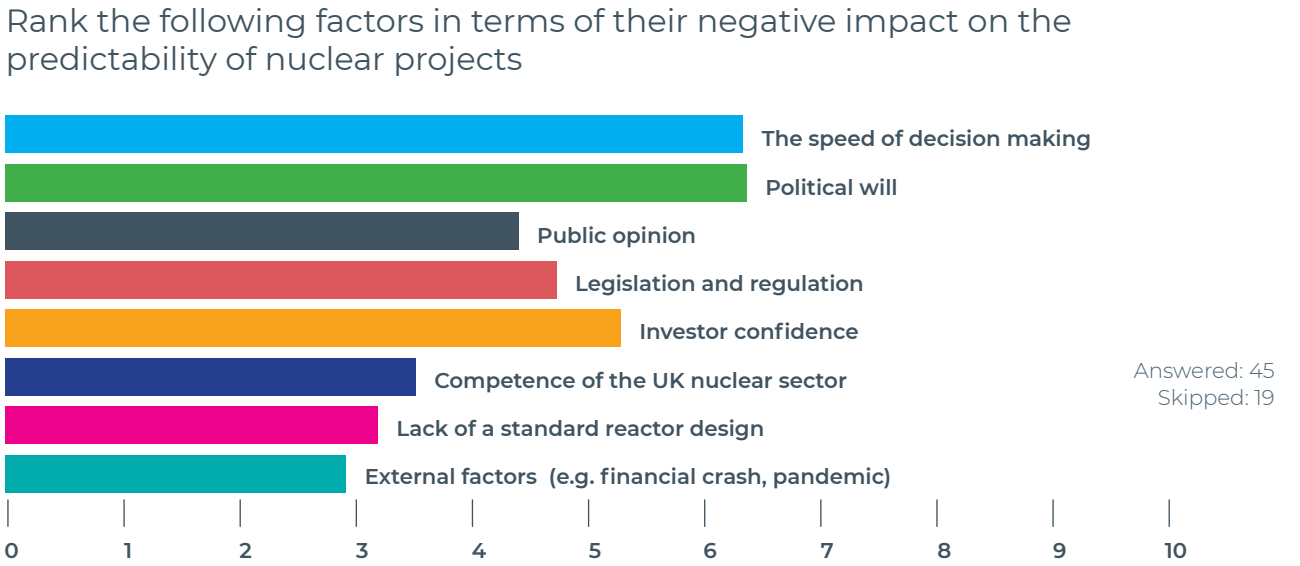

Figure 8: Survey results for negative impacts on predictability

Committee report published in 2016, looking into the issues underlying poor investor confidence in the sector. The independent literature also has much to say on why megaprojects, including nuclear power plants, are late and over budget. SIG member Professor Giorgio Locatelli, in his MIT paper from 2018 *"Why are megaprojects, including nuclear power plants, delivered over budget and late?"* reviews this literature and identifies some significant points about the relevance of decision making to megaproject predictability. Of particular interest is the conclusion that megaprojects and nuclear projects in particular do not fit the normal definition of a project being a temporary endeavour, with some project organisations actually outlasting the so-called 'permanent' organisations that created them. This leads to a question about the permanent organisations' involvement in the decision making process. Should they impose their own internal governance arrangements or should the project stand alone in terms of its decision making process?

Taking a different perspective, Professor Bent Flyvbjerg, maintains that some decision makers (politicians, for example) have much to gain by skewing the decision making process for short term political gain rather than long term project objectives. He calls this strategic misrepresentation.

However, at present there is little definitive data on the actual performance of the decision-making process within nuclear projects or any guidance on how to identify solutions that would work in our context. The SIG is keen to understand the data in more detail and propose potential options for change.

There are many knock-on effects which compound the root cause of slow decision making and reveal themselves in different ways and these are examined in more detail later. The full range of consequences of the inability to make rapid decisions warrants closer examination. There are probably many other hidden consequences linked to the culture instilled by a feeling of being hamstrung by the project's own governance arrangements. How many options never make the project board agenda because the "'inventor' abandons the idea knowing there's *no way it would get approved on this project?* This stifling of innovation could be the single biggest consequence of a slow decision making culture. These cultural aspects will be examined further by the SIG in a future paper.

Validation of the hypothesis

Rank the following factors in terms of their potential positive impact on the predictability of nuclear projects if they were implemented/improved

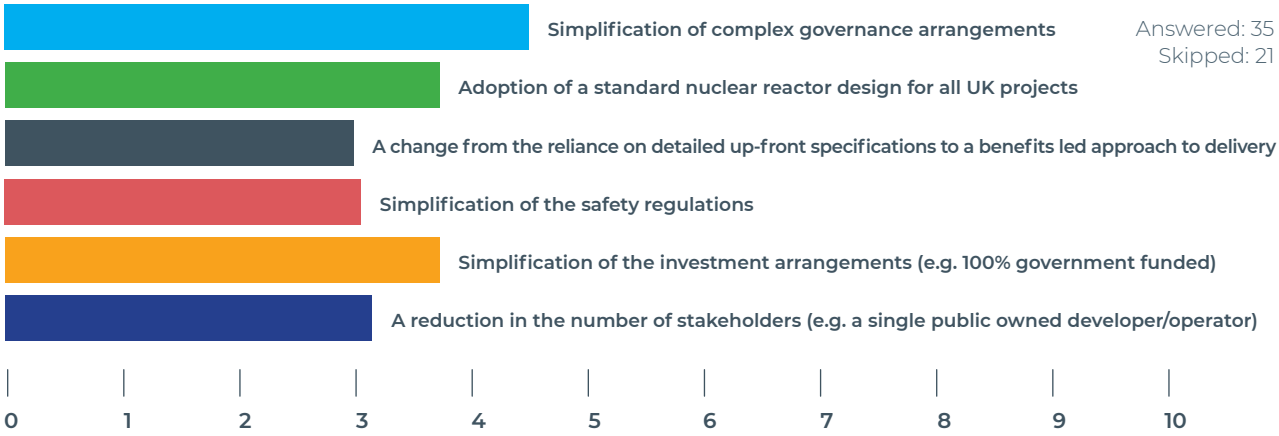

Figure 9: Survey results for positive impacts on predictability

If the hypothesis is true, then there's something special about UK (or western) nuclear projects that impact decision making speed and cause unpredictability of outcomes. In the SIG we have identified a number of issues that we think are different. Our focus is project management issues that are unique to the nuclear industry. We also put this question to our survey participants and they identified a number of issues of broadly equivalent significance (Figure 89). We'll explore these further next.

Stakeholder complexity: The UK has a far more complex set of stakeholders than, for example, the UAE, which, as you would expect is very lean, being new. In Figure 10 below we've identified some of the key stakeholders in the UK nuclear industry and compared it to the relatively simple model in the UAE. If you want to change the way the industry works in the UK, then there are a lot of stakeholders that need to be consulted. All of them are very capable lobbyists and we've

United Kingdom Stakeholders

UAE Stakeholders

Figure 10: UK nuclear stakeholders

not even included the NGOs or the media in this image and we've not addressed the significant number of academic influencers.

The nuclear industry has become progressively more fragmented over the 60 years of its existence. At one stage in its history, probably the peak of productivity in the nuclear project delivery sector, the UK's stakeholder map was not unlike the UAE's, with a single developer/operator, one research body, one regulator and large engineering giants with vertically integrated supply chains. Over the years as we have privatised, globalised and decentralised we have created quite a complex set of relatively small, but influential players. This makes decision making complex, with more stakeholders wishing to be involved, leading to decision paralysis in some cases. The number of stakeholders often creates overlapping and duplication in governance, for example in the decommissioning sector where a decision in a Site Licence Company (SLC) may need to be approved at several levels within the SLC, followed by the parent body, Nuclear Decommissioning Authority, independent Government-appointed directors (UKGI), BEIS and Treasury; all with the same remit to ensure value for the public purse. Many observers have concluded that decision making is most effective when the decision is taken by the person at the level most capable of making an informed decision, so this extended hierarchy is likely to result in poor quality decision making due to the decision ultimately being taken by someone who lacks a 'feel' for the project. We should also recognise the regulatory process needs to take place in series with project and shareholder governance processes requiring internal approval before submission to the regulator. Often regulators may require six months to consider a major change and this time period in itself rules out a number, if not most, potential risk mitigation options that require a major safety case change. In some cases, different regulators' guidance may even conflict, which introduces further complexity (e.g. the classic problem of the locked door – for security reasons – versus the unlocked door – for emergency evacuation).

Safety culture: We're rightly proud of our nuclear safety record in the UK, but that doesn't mean that our governance model is optimised. Clearly the safest nuclear power plant is the one you don't build, so safety culture will tend to push governance towards saying 'no' rather than 'yes'. Has the culture of the industry become institutionally risk averse, which also affects how it deals with commercial risk? Do we have an effective way of trading a significant benefit to society with a slight increase in safety risk? Do we even optimise safety risk? What's the point of driving ever higher safety standards into the design of a waste treatment plant which will substantially delay its start date if the plant it's designed to remove waste from is severely compromised and the potential consequence of failure is intolerable? Sellafield Limited is starting to get its head around this issue now, but it's not easy and it goes against 60 years of learning where ALARP has only really been considered in the context of the plant you are designing and not the risk of the overall nuclear and energy programme, let alone the benefit to society as a whole. *Note: ALARP is the UK's best practice approach to reducing risks from an operation to as low a level as is reasonably practicable.*

Input specification vs. outcomes: In the UK, there's a tendency to focus on the project (input) specification rather than (output) objectives. This is driven by a more commercial approach to project management which enables a clearer transfer of scope, and hence risk, to vendors. Much has been written about the advantages of a value-driven or benefits management approach to project delivery and this is a topic the Nuclear PM SIG will be exploring further in the future (and has already published a blog on this topic as part of this study). In addition, it has proved extremely difficult to accurately define a detailed input specification. In a complex stakeholder environment with complicated engineering solutions it is highly unlikely that the project team will be able to specify the detailed project requirements with any degree of confidence on day one of the project. This means that the project will need to manage

significant change as requirements are discovered, adjusted or deleted as the project team gains a better understanding of the issues it is dealing with. As we've already discussed the nuclear industry in the UK has a relatively long decision making time which means that the intent and the agreed requirements start to diverge rather than converge. Modern value driven approaches use techniques such as Agile, systems thinking and lean innovation to maximise project value by starting with a high-level definition of the objectives and allowing the detailed requirements to be discovered as the project progresses. In an enabling culture these techniques foster collaboration and innovation. In its ultimate conception it guarantees on time delivery and control of the budget (the scope is rapidly varied to maintain these). There are compelling examples of this being used in highly safety regulated industries, such as aerospace, where the SAAB Grippen E fighter, delivered in a wholly agile way shows remarkable project performance metrics when compared with its main competition, the Lockheed Martin F35.

Could we ever contemplate this approach in the nuclear sector? Surely the nuclear safety case demands a tightly defined, agreed specification early in the project so that the safety analyses can be completed before the design is frozen? It can be argued that the UK regulatory approach is inherently agile: with the basic safety level representing Agile's *minimum viable project* concept and the basic safety objective being the optimal design with Agile features added in increments as the project (or series of projects) progress and when ALARP dictates. In reality the regulatory approach is applied in a more traditional staged improvement fashion which impacts standardisation, but conceptually this does not have to be the case.

Complex operating models. These are partly a result of industry fragmentation and make close collaboration difficult, even using modern IT tools that have produced significant results in other industry sectors (e.g. the BIM paradox, where BIM does not deliver the same benefits as PLM does in manufacturing industries). *Note: BIM is the building information modelling approach to design and collaboration. PLM is the manufacturing sector's approach to product lifecycle management.*

The example shown in Figure 11 is real but anonymised. The example on the right comes from a client study carried out by one of

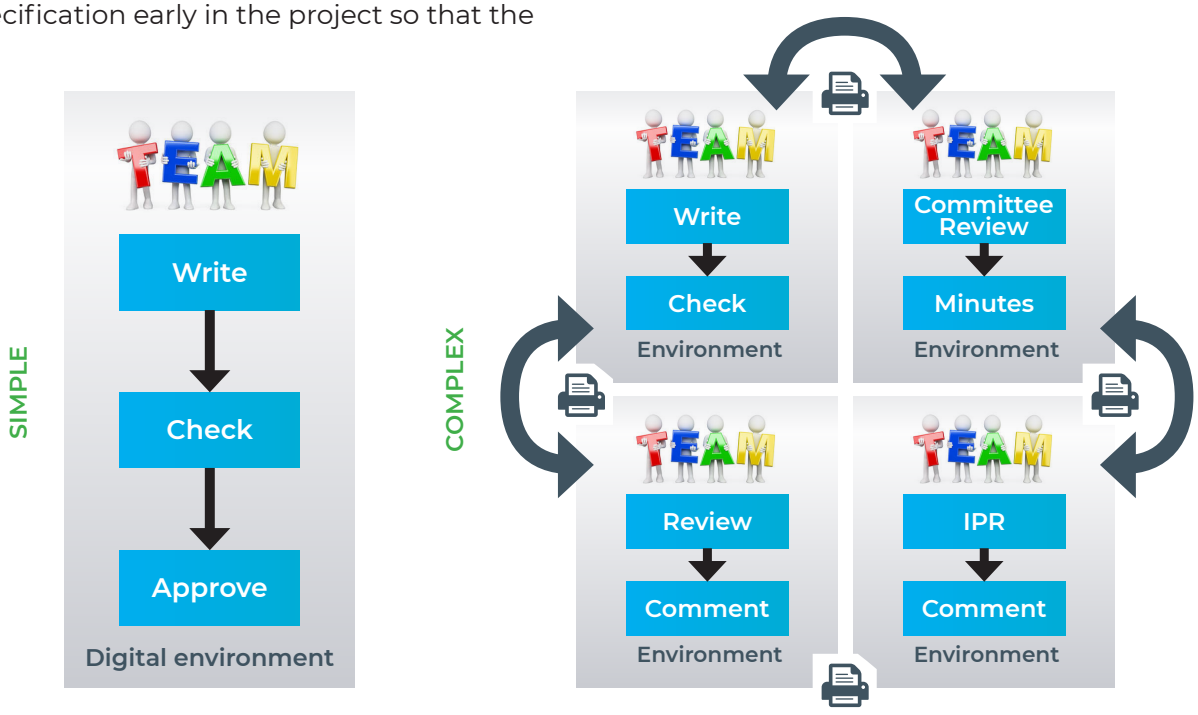

Figure 11: Simple and complex operating models for quality assurance

the consultancy members of the Nuclear PM SIG. This shows a client working with three suppliers operating in a loose, non-incorporated joint venture. The client and each of the suppliers operated in different, largely non-digital environments and in order to complete the quality assurance of the design 2-D drawings were extracted from the 3-D model and sent through the post to the next company in the process. And so on, until approved. Modern digital tools were being used, but there was no connection between the environments. This was partly because of commercial concerns of giving visibility of progress to the client and other companies in the arrangement. In the modified model shown on the left the design was released in a shared 3-D environment and rapidly progressed through the quality assurance cycle, improving throughput and decision making time by the order of 90%.

It can be seen that each of the issues adversely affect decision making time. This helps to underpin the hypothesis and this cycle time should be a key project management metric. The project should attempt to keep this metric close to the industry optimum value and ensure it doesn't pass a critical value at which point the project becomes unstable. At present these trigger values are an unknown and significant effort should be put into evaluating these critical metrics.

Consequences of slow decision making

In our view the main consequence of poor decision making is unpredictability and subsequent loss of investor confidence. However, there are other knock-on effects which compound the root cause of slow decision making and reveal themselves in different ways. For example, it is often quoted that the key lesson from previous nuclear projects is to agree the detailed design before build commences, but all nuclear projects suffer from late identification of unknown requirements (especially first-of-a-kind projects) and a slow decision making cycle means the design can't be updated quickly enough to ensure it is fixed before the next key stage of the project has to commence to maintain the planned end date. It is probable that proceeding to build before freezing a standard is not the root cause. The root cause is the inability to manage change fast enough to fix the design in the face of changing requirements. This is driven by slow decision making.

Another knock-on effect may be that smaller, less complicated projects find themselves mired in lengthy governance procedures designed for megaprojects, perhaps because of their safety significance. Again, this may be a consequence of the temporalities of projects discussed earlier and a failure to recognise that it may be more appropriate to consider megaprojects as permanent organisations with separate governance arrangements distinct from their parent organisations and their internal projects.

We should also consider whether a standard graded decision making model for nuclear projects could be beneficial by creating a common understanding of how the industry works, facilitating learning and enabling easier practitioner transfer from project to project in a skills-challenged sector. Such a model would need to cater for the wide range of differences between megaprojects and smaller projects and sectorial differences between decommissioning projects, gigawatt scale light water reactor new builds, small modular reactors and fusion reactors. Consequences and motivations are very different between these different sub-sectors and may require different governance models. This is an area where work is already going on and there are signs of real progress. Work at LLW Repository is an example of this and benefits are already being realised. We can see from this example that when governance is optimised, decision making is accelerated and project performance improves.

CONCLUSION AND RECOMMENDATIONS

Conclusions

We have identified that nuclear megaprojects take place in a complex stakeholder environment with ever more complicated design solutions. However, the speed of decision making appears to be slow; exacerbated by complex governance arrangements. This means fewer risks can be mitigated and projects go late and over budget, resulting in unpredictable project outcomes. This causes investors to lose confidence, causing projects to be abandoned or paused which means we don't benefit from the learning curve experienced by our colleagues in Korea, Japan, China and now the UAE. However, we are seeing green shoots of improvement and we think the time is right to understand the root causes in more detail so that we can develop useful insight and guidance which will help those leading these critical projects to improve the predictability of their projects.

The key knowledge gap we lack at the moment is definitive data linking the speed of governance/decision making on nuclear projects with project predictability. This is an area that the SIG wishes to explore in more detail. Projects monitor many things and for commercial reasons decision making time is often measured, so there should be data available. Another useful source may be project board meeting minutes which often track key decisions.

Recommendation 1: Project Management Community

Our guidance for project managers is to ensure the decision making cycle is fully understood and measured for the project in question. This should be shown explicitly as an activity on the schedule on every occurrence where, in order to make the decision, stakeholders outside the immediate project team need to be engaged. Stakeholders in the parent companies of the project consortium should be considered to be external to the project in this context. There should be a clear rationale for the durations included on the schedule with confidence levels similar to the confidence levels used in the rest of the schedule.

Further the project should understand the critical decision making time for their project. This is the average time, above which, the project becomes unstable and unpredictable, i.e. risk mitigations cannot be implemented due to the time taken to agree changes in approach. Finally, the project should measure the average decision making time and ensure it remains safely below the critical limit. We recommend further work is carried out by the project management and/or academic community to investigate how to derive critical decision making time and develop a benchmark of average decision making times for recent projects.

Recommendation 2: The Senior Stakeholder Community

We believe the complexity of the stakeholder community in the UK and the associated governance arrangements adversely affects decision making time and threatens the critical decision making time limit on major nuclear projects. In agreeing new funding, regulatory and ownership models, Government and other senior stakeholder bodies should simplify the stakeholder map and ensure lean governance models can be implemented which are predictable and can be forecast with confidence by the project manager. We recommend further analysis is conducted on the actual stakeholder interactions in recent projects and conduct a lean assessment of these maps to understand where 'waste' exists and what measures can be taken to simplify the stakeholder map and interactions.

Recommendation 3: The Owner/Operator Community

Complex nuclear projects need assurance and governance arrangements designed to optimise the decision-making environment for those projects. These arrangements should not merely be imported from the parent owner/operator organisations. They should recognise the longevity of these project organisations and not treat them as transient teams in the way other internal projects may be treated. In doing this, it is also important that the proportionality principle is applied such that smaller (or rather less risky projects) are enabled by swift, efficient arrangements commensurate with the lower risk profile they present to the business.

NUCLEAR PM SIG

Find out more or get in touch

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We welcome your views on this paper and any of the point raised – please send any feedback or ideas to **pm.sig@nuclearinst.com**

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