



**Working Group on Manufacturing, Construction,
Commissioning and Operation**

Phase 3 Report

**Conduct of Authorised Activities
Impact on Stakeholders'
Organisational Capabilities
(Designers, Vendors, Manufacturers,
Supply Chains, Operators)**

December 2023



**Conduct of Authorised Activities Impact on
Stakeholders' Organisational Capabilities (Designers, Vendors,
Manufacturers, Supply Chains, Operators) Requests**



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EXECUTIVE SUMMARY

There continues to be sustained global interest in small modular reactors (SMRs), which have the potential to play an important role in globally sustainable energy development as part of an optimal energy mix. In particular, SMRs may enhance energy availability and security of supply in countries expanding their nuclear energy programs and those embarking on a nuclear energy program for the first time.

As the interest in SMRs continues to grow, so does the importance of international collaboration. Given that its main purpose is to bring together experienced regulators to identify and address key SMR-related challenges, the SMR Regulators' Forum has an increasingly important role to play in making such collaboration possible.

The SMR Regulators' Forum was formed in 2014 as a regulator-to-regulator entity to consider key issues that could emerge in future SMR regulatory discussions and propose common positions regarding the way in which these could be addressed. The Forum's work is expected to help enhance safety as well as efficiency in SMR regulation, including licensing, and to enable regulators to inform changes, if necessary, to their requirements and regulatory practices. Since then, the Forum has had three phases of work. For more details about the Forum, please visit: <https://www.iaea.org/topics/small-modular-reactors/smr-regulators-forum>.

This report has been produced by the Manufacturing, Construction, Commissioning and Operation (MCCO) Working Group (WG) of the SMR Regulators' Forum during its Phase 3 (2021 to 2023). It considers how the introduction of SMRs might impact a Licensee's ability to perform its authorised activities, in particular, a requirement to ensure that work performed by Licensees and their supply chain, demonstrably meets the requisite standards, recognizing that some of this work (e.g. SMR design) may have been completed long before making an application to the nuclear regulator. Consideration is also given to issues surrounding small or new Licensees. The report also suggests a possible focus for exploration in Phase 4 of the MCCO WG.

This report was developed based on information, insights, and experience gained from the regulatory activities of the SMR Regulators' Forum members. It is generally consistent with existing IAEA documents but may deviate in some cases. This report is intended to provide useful information to regulators and industry in the development, deployment and oversight of SMRs. While each Member State has its own laws and regulations with regards to the granting of permissions, the Working Group aims to identify "common positions" i.e. statements relevant to the issue under discussion that are unanimously agreed.

The MCCO WG considered the need to update the IAEA requirements to include manufacturers in the definition of "Authorised activities". After very thoughtful discussions, the MCCO WG decided that authorised activities should be managed by Member State regulators to ensure flexibility is available to all the Member States. This report therefore contains no recommendation for the IAEA in this respect. Common positions generated by the MCCO WG are provided below.

Common Positions for this report

Common Position 1

The Member State Regulator may allow the Licensee to delegate authorised activities to the vendor or the manufacturer of safety related equipment/products provided that the regulator has developed clear regulations and guidance. Ultimately, the Licensee is still responsible for the authorised activity.

Common Position 2

In the case of off the shelf products and absence of Licensee during the manufacturing process, Licensee must have capability to retrospectively reconcile whether the manufactured product meets the regulatory requirements and reject any product if evidence of this is inadequate.

Common Position 3

Regulators should consider how their regulatory requirements with regards to 'Intelligent Customer' capabilities may be met for small Licensee organisations.

Common Position 4

Size of the Licensee's organisation is not a consideration for whether the regulatory requirements need to be met. In all cases, the Licensee is responsible for meeting the applicable regulations or seeking appropriate exemptions.

Common Position 5

There is no minimum size of a Licensee as long as they are capable of carrying out activities that they are authorised and required to do.

Common Position 6

The recruitment of staff with nuclear safety experience by all stakeholders (vendor, supply chain, Licensee and regulator) will be key to safely executed SMR projects and will mitigate the risk of delays to both the project schedule aspects and the regulatory process.

Common Position 7

There should be a preference for early identification of a capable Licensee for a first of a kind (FOAK) deployment in order to develop regulatory and market confidence in advance of moving to the Nth of a kind deployment under the scenarios defined in this section.

Common Position 8

With the current demand for experienced resources throughout the nuclear industry, both nationally and internationally, there is a need to develop and establish training programs to ensure new nuclear expertise is being created and maintained.

Common Position 9

It is likely that nuclear experience will continue to be very limited, therefore SMR Licensees and vendors will need to explore mitigation strategies such as exploring the potential for using shared resources, other innovative approaches and use of technology and service based models to address some of these challenges.

Common Position 10

It is expected that SMRs are going to be primarily factory built leading to further globalised supply chains. Therefore, there is an opportunity for harmonisation and standardisation in all levels of organisations, including Member State regulators, Licensees, vendors and supply chains.

Common Position 11

Current regulatory assessment of a Licensee's capability related to supply chain oversight is effective and can be applied to SMRs with some targeted improvements.

Common Position 12

Benchmarking will be an important tool in support of capability assessments for SMR vendors and Licensees as there is currently very limited operational experience available.

1. INTRODUCTION

Over recent years a number of significant geopolitical issues have emerged driving nations towards ambitious nuclear energy plans/programs. Environmental factors and the drive towards zero carbon emission coupled with more recent concerns around energy security has led to many national governments exploring options for nuclear reactor deployments and in particular in regard to SMRs.

The purpose of this report is to consider how the introduction of SMRs might impact the conduct of Authorised Activities by Licensees, in particular, their capability to ensure that work performed by Licensee and their supply chain demonstrably meets the requisite standards, recognizing that some of this work (e.g. SMR design) may have been completed long before making an application to the nuclear regulator. Consideration is also given to issues surrounding small or new Licensees. The report also suggests a possible focus for exploration in Phase 4 of the MCCO WG.

In its Phase 2 report [1], the MCCO WG started with the premise that existing arrangements to regulate activities involving large nuclear power plants are also suitable arrangements to regulate activities involving SMRs, with some adjustments and balancing to take into account novel deployment approaches and safety features under the SMR business model. Consequently, a single organisation (ie. Licensee) should be responsible and accountable for safety.

The Licensee needs to be resourced and capable of establishing adequate oversight of the supply chain. The Licensee may not be able to have influence over the design. However, they should have comprehensive understanding of the design and oversight of procurement process to ensure nuclear safety. This includes those aspects of nuclear safety, ensured by design and quality standards in the period of first supply and assembly.

A proposal to recommend the IAEA to update its definition of authorized activities to include manufacture of safety-sensitive nuclear components was discussed by the MCCO WG and, after careful debate, rejected on the grounds that Member States should retain the flexibility to decide this themselves.

The MCCO WG considered that the Licensee will likely be a smaller organisation for SMR projects than for large nuclear power plant (NPP) projects or possibly new to nuclear power, and therefore may delegate a greater portion of activities to vendors (i.e., designers) and contractors. However, Member States agree that the Licensee will always be accountable for safety. This report discusses the conduct of authorised activities and its impact on stakeholders' organisational capabilities associated with smaller Licensee organisations (or no Licensee presence). With a smaller Licensee organisation, and possibly a less knowledgeable Licensee, the MCCO WG considered whether a vendor needs a larger organisation to make up for the lack of knowledge. The MCCO WG also considered how regulators address this scenario in their current regulatory framework and if the regulatory expectations are in place to allow a small Licensee organisation with contractual arrangements with a vendor.

2. KEY CONSIDERATION ON STAKEHOLDERS' ORGANISATIONAL CAPABILITIES FOR AUTHORISED ACTIVITIES

2.1 KEY CONSIDERATIONS RELATED TO STAKEHOLDERS' ORGANISATION FOR AUTHORISE ACTIVITIES

Common Position 1

The Member State Regulator may allow the Licensee to delegate authorised activities to the vendor or manufacturer of safety related equipment/products provided that the regulator has developed clear regulations and guidance. Ultimately, the Licensee is still responsible for the authorised activity.

If the State regulator allows delegation of authorised activities related to manufacturing, then the regulator should develop/improve clear requirements/guidance. Licensees should ensure they have oversight over their vendor's or manufacturer's processes and the ability to contractually require their supply chain to meet the relevant standards/regulations (including an acceptable quality assurance process in place). In all cases, the responsibility for authorised activities remains with the Licensee.

Common Position 2

In the case of off the shelf products and absence of Licensee during the manufacturing process, Licensee must have capability to retrospectively reconcile whether the manufactured product meets the regulatory requirements and reject any product where evidence of this is inadequate.

Member States will need to consider that there will be situations where a Licensee will not be involved or identified until a later stage of the lifecycle of an SMR project and would need to retrospectively evaluate previously manufactured and assembled products to regulatory requirements. Vendors/Manufacturers have to understand the regulatory requirements and incorporate them into their processes in order to ensure that the manufactured components/modules are fully compliant with the requirements. This evidence could consist of documentation and material samples for retrospective analysis and could include verified video footage, chemical analysis etc. Prior to purchase, the would-be licensee will need to satisfy itself that the evidence is sufficient to demonstrate compliance. Approaches used to assess a Licensee's capability for retrospectively evaluating and justifying manufactured products will be further discussed in Phase 4 report.

2.3 INTELLIGENT CUSTOMER¹ AND CONCEPT OF A SMALL AND CAPABLE LICENSEE

Common Position 3

Regulators should consider how their regulatory requirements with regards to 'Intelligent Customer' capabilities may be met for small Licensee organisations.

Common Position 4

Size of the Licensee's organisation is not a consideration for whether the regulatory requirements need to be met. In all cases, the Licensee is responsible for meeting the applicable regulations or for seeking appropriate exemptions.

Common Position 5

There is no minimum size of a Licensee as long as they are capable of carrying out activities that they are authorised and required to do.

Capability of the Licensee related to nuclear activities should be dictated by the schedule of activities it is undertaking under a particular phase of the project and mapped against the requirements to ensure they can safely conduct those activities. The capabilities required in different phases/lifecycle will be different, however at all phases the capabilities for active phase should always be sufficient to ensure ability to meet regulatory requirements.

The Licensee needs to be appropriately resourced² to ensure it has the capabilities to undertake all authorised activities including being an Intelligent Customer for oversight³ of its supply chain⁴. The Licensee needs to be capable to assess the aggregate risk of multiple suppliers.

For most Member States, one of the ways SMRs are expected to be different from traditional large NPP is the size of the Licensee organisation as some of the activities could be delegated to vendors and the supply chain. As a shift from larger to smaller organisations occurs, regulatory bodies will have to provide clear expectations and guidance on the concept of intelligent customer and authorised activities relating to the Licensees. The small size of a Licensee organisation should not result in an inability to meet applicable regulations and requirements.

Currently, large NPP Licensees can choose to either maintain the capability for oversight or procure a third party oversight, however Licensee organisations tend to be relatively large in comparison to suggested SMR organisational models. With the smaller Licensee organisation,

¹ The concept of an Intelligent Customer is described in Section 1.3, Supply Chain Management, Page 26, of Phase 2 Report produced by the SMR RF's MCCO WG [1].

² 'Resources' includes individuals (the number of individuals and their competences), infrastructure, the working environment, knowledge and information, and suppliers, as well as material and financial resources.

³ The organization shall put in place arrangements with vendors, contractors and suppliers for specifying, monitoring and managing the supply to it of items, products and services that may influence safety.

⁴ The supply chain, described as 'suppliers', typically includes: designers, vendors, manufacturers and constructors, employers, contractors, subcontractors, and consigners and carriers who supply safety related items. The supply chain can also include other parts of the organization and parent organizations.

the responsibility for oversight of their supply chain might be challenging. The Licensee might consider hiring a third party organisation or form a partnership for supporting the oversight activities which could provide a degree of mitigation for limited capacity in the Licensee organisation.

The Licensee has the responsibility to ensure that the vendor's supply chain has the capability to provide oversight such that counterfeit fraudulent suspect items (CFSI), supplier Quality Assurance and source surveillance are adequately managed. The Licensee is responsible for configuration management regardless of whether the activities are carried out by themselves or the vendors/supply chain. Configuration management includes design and is not limited to software management.

For some projects there will be a heavier reliance on supply chain for both services and materials. However, the location of this supply chain (international or national) may vary greatly from one Member State to another as it depends on the industrial context of each country.

Requirement 11, "Management of the supply chain," of the IAEA Safety Standard Series No. GSR Part 2 [2], provides expectations of how arrangements between licensees and their vendors/contractor and supplier should be managed. The IAEA has already noted in Ref. [3] that there is a gap identified related to oversight and quality control where a future Licensee is not identified and will be working in the near future to address it.

3. NEW TO NUCLEAR AND LIMITED NUCLEAR EXPERIENCE

3.1 NEW TO NUCLEAR:

Common Position 6

The recruitment of staff with nuclear safety experience by all stakeholders (vendor, supply chain, Licensee and regulator) will be key to safely executed SMR projects and will mitigate the risk of delays to both the project schedule and the regulatory process.

New to nuclear from the regulators' point of view means new organisations with minimal experience of the regulatory environment or licensing process. Furthermore, new organisations with minimal experience may not fully understand their responsibilities as it pertains to the oversight of the supply chain.⁵

For some Member States with SMRs, there is a lot of potential commercial risk is being transferred from the Licensee to the vendors and manufacturers especially related to long lead items. Where a Member State government is financing SMR development, the regulator could be impacted. Even so, regulators are responsible for the review of the safety case of the SMRs. Since there are a lot of new SMR vendors and manufacturers engaged in SMR deployment, this will introduce new corporations and people to the nuclear industry that will have limited

⁵ The organization shall itself retain the competence to specify the scope and standard of a required product or service, and subsequently to assess whether the product or service supplied meets the applicable safety requirements.

nuclear related experience. This will have a potential risk that the vendors or manufacturers may not necessarily understand or be aware of regulatory requirements and might miss certain testing, manufacturing and quality processes that need to be followed to ensure products meet the requirements of codes and standards. Mitigation against this could take the form of a precicensing process such as engaging with the vendor to increase its understanding of the regulatory requirements. It is recommended that SMR vendors reach out to the appropriate regulatory authority early in the design process. As it is likely that most of the SMRs will be manufactured, assembled and tested (i.e., Factory Acceptance Testing (FAT)) in a factory setting and delivered to sites in modules, such arrangements will need to be appropriately managed.

There are multiple potential scenarios in which new or existing vendors, Licensees and manufacturers may need to engage with the regulatory body and thereby challenge both regulatory resources and SMR project timelines. Some of these are examined below.

3.1.1 Scenario 1: New Licensee with experienced Vendor

This scenario will place an increased burden on regulators because the Licensee will need to understand the regulatory process/framework. An experienced vendor could, however, provide some relief by supporting the new Licensee. For example, the vendor may have its own internal licensing group that supports the Licensee in regulatory engagement and authorised activities.

3.1.2 Scenario 2: Experienced Licensee with new Vendor

This type of situation will need a larger Licensee organisation to provide adequate oversight of the vendor and to support the vendor in understanding regulatory requirements. It also affords the opportunity for the Licensee to be more involved during the design process with the vendor which would be mutually beneficial.

3.1.3 Scenario 3: New Licensee with new Vendor

This scenario will place the most demand on regulator resources. Both the Licensee and vendor will need to be appropriately resourced to ensure regulatory requirements are understood and effectively applied throughout the design and manufacturing process, as well as construction and licensing. In this scenario, key concerns are the Licensee's resources and the level of understanding of the applicable regulations by both the Licensee and vendor; where there are shortfalls in both areas (i.e. resources and understanding), the challenge to regulators could be significant.

3.1.4 Scenario 4: New Vendor and no Licensee during early stages

This situation carries a risk that the vendor or manufacturer(s) will not understand or be unaware of the regulatory requirements including codes and standards so that certain required testing, manufacturing and quality processes are omitted, thus increasing the burden on the regulator.

The absence of a Licensee (i.e. customer) will increase the vendor's commercial risk especially if expensive long lead items have been manufactured in advance. If the Licensee gets involved at a later stage, there could be a steep learning curve to understand both the regulatory framework and vendor design. There would also be a risk that early manufactured modules may not meet the required standards or cannot be proved to do so.

3.1.5 Scenario 5: Experienced Vendor in another Jurisdiction (i.e. Another Country or Member State)

Vendor will need adequate capacity in the understanding of the regulatory requirements in the new jurisdiction where the SMR will be located. There could also be situations where this jurisdiction is new to nuclear and does not have an established or mature regulatory framework or where the vendor and licensee are from different jurisdictions. The SMR design would be considered to be FOAK in both of these situations. The IAEA NHTSI (Nuclear Harmonisation and Standardisation Initiative) Working Group 3 is considering scenario 5 in its work.

Common Position 7

There should be a preference for early identification of a capable Licensee for a FOAK deployment in order to develop regulatory and market confidence in advance of moving to the Nth of a kind deployment under the scenarios defined in this section.

Regulatory and market confidence in the capability of both the licensee and the vendor would rise during the FOAK deployment. It is expected that the vendor or a potential Licensee would self-identify themselves to the regulator as early in the project as possible. For subsequent deployments with either the same licensee or a new licensee with the same vendor, the understanding and experience gained from the FOAK deployments would provide increased confidence in subsequent deployments.

3.2 SKILLED AND EXPERIENCED NUCLEAR RESOURCES ARE LIKELY TO BE VERY LIMITED BOTH NATIONALLY AND INTERNATIONALLY.

These ambitious and diversified nuclear programs will require significant levels of skilled human resources to realise the ambitions both at national and international level. At a national level some countries will struggle to resource their program due to the scale of their program whilst at an international level the number of countries who have emerged almost simultaneously with such programs will stretch the international nuclear skill base.

Common Position 8

With the current demand for experienced resources throughout the nuclear industry, both nationally and internationally, there is a need to develop and establish training programs to ensure new nuclear expertise is being created and maintained.

Common Position 9

It is likely that nuclear experience will continue to be very limited, therefore SMR Licensees and vendors will need to explore mitigation strategies such as exploring the potential for using shared resources, other innovative approaches and use of technology and service based models to address some of these challenges.

The increase in the number of SMR vendors will drive an increased demand for nuclear skilled and experienced resources in the nuclear industry as a whole (including regulators) and will require both short and long term solutions. In the short term there could be innovative solutions developed such as shared resources among different Licensees deploying the same SMR design and use of technology, shared technical support organisations, etc. For the longer term, education and training will play a key role in ensuring all the knowledge gaps are being bridged

including safety culture being established in Licensees, vendors, and supply chain. Another potential solution could be Licensees looking to vendors and manufacturers for service based models to support design, operations and maintenance. In this case there will need to be robust contractual arrangements in place between Licensees and the service providers to ensure that these services will be available throughout the lifecycle of the SMR.

4. LIKELY GLOBALISATION OF SMR SUPPLY CHAIN HARMONISATION AND STANDARDISATION BETWEEN COUNTRIES REGULATIONS

Common Position 10

It is expected that SMRs are going to be primarily factory built leading to further globalised supply chains. Therefore, there is an opportunity for harmonisation and standardisation in all levels of organisations, including Member State regulators, Licensees, vendors and supply chains.

This topic is being explored in detail through a IAEA's NCSI and Committee on Nuclear Regulatory Activities (CNRA) working group on supply chain. The results from these working groups can potentially be used as models. This Phase 3 report is a broad look at this concept in relation to manufacturing.

5. ASSESSMENT OF CAPABILITIES FOR SMR LICENSEES

Common Position 11

Current regulatory assessment of a Licensee's capability related to supply chain oversight is effective and can be applied to SMRs with some targeted improvements.

Capability of the Licensee related to nuclear activities should be dictated by the schedule of activities it is undertaking under a particular stage of the project and mapped against the capability requirements to ensure that they can safely conduct those activities. The required capabilities of a Licensee will change throughout the project phases/lifecycle, however at all stages the capabilities for the active phase should always be sufficient to ensure that regulatory requirements⁶ are met. For SMRs specifically, it is expected that regulators would need to verify a smaller subset of Licensee activities (compared to conventional NPPs) due to the anticipated optimised/rationalised nature of safety related systems and operations. The assessment of Licensee capability for oversight of the supply chain is not an exact science and is inherently objective/outcome based in nature. The capability could reside in house in the Licensee organisation or could be contracted out to a vendor. There are well established approaches for assessing capability which have been applied for many years and have been effective in the assessment of capability for large NPP licensees and since these assessment approaches are not limited to a specific design these practices can be adopted for SMRs and would result in continued use of these practices with some targeted improvements.

⁶ Requirement 9, Provisions of resources, of Ref. [4].

Common Position 12

Benchmarking will be an important tool in support of capability assessments for SMR vendors and Licensees as there is currently very limited operational experience available.

Capability assessment is conducted through assessment followed by a judgement decision in which benchmarking plays a key role. There are a number of direct measures that can be utilised when developing benchmarking for capabilities (i.e., training, qualifications, experience, quantity and quality of inspections, work planning/ backlogs). In this context, capability covers not only competence of personnel but also the tools and processes they use to undertake the activity safely - the 3 P's: People, Processes and Platforms. The approach used for large NPPs to date can be used to inform the assessment of capability for SMR Licensees but there will be very limited benchmarking information available that is specific to SMR designs themselves. In this case the knowledge gained as FOAK assessments are made and early feedback will be important in informing future approaches. Without available relevant experience, regulators may expect additional provisions and margins to be put in place, these being proportional to the risks. Chapter 2 of MCCO WG Phase 2 report [1] presents common regulatory positions on the use of experience in activities related to the entire lifecycle of the SMRs that can be used to inform future approaches.

Existing Licensees of conventional NPPs should be able to apply their experience of managing supply chains to SMRs while, of course, recognizing and accommodating the differences. New Licensees will find this more difficult and may need to rely heavily on regulatory guidance. There will be differences between experienced/mature Licensees vs new Licensees. Benchmarking current large NPP reactor fleet Licensee and supply chain processes would be beneficial for new SMR Licensee/vendors.

Regulators, when looking at developing their approaches for assessment of capability, can leverage the IAEA and other regulators' standards and approaches around the world. In countries where SMRs are being deployed, sources of benchmarking and identification of best practices will accumulate over time.

6. CONCLUSIONS

The MCCO WG has considered the implications and challenges of SMRs on the capabilities of all stakeholders including designers, vendors, manufacturers, supply chains and Licensees.

Some of the authorised activities (such as the design) for SMRs could be carried out in the absence of a Licensee. All materials justifying the fulfillment of regulatory requirements at the stages that were implemented before the appearance of the organisation applying for a license and the materials necessary for the license applicant to provide to the regulator when applying for a license must be provided to the applicant by vendor or manufacturer.

The Member State regulator may allow the Licensee to delegate authorised activities to the vendor or the manufacturer for safety related equipment/products provided that the regulator has developed clear regulations and guidance. Licensees should ensure they have appropriate oversight over their vendor's or manufacturer's processes and the ability to contractually require their supply chain to meet the relevant standards/regulations (including an acceptable quality assurance process in place). In all cases, the responsibility for authorised activities remains with the Licensee.

The SMR business model introduces new reactor technologies and therefore organisations (vendors, Licensees, etc.) that will have to compete for an already limited number of experienced nuclear professionals. The members of the SMR Regulators' Forum agree that this lack of experience can be mitigated by strengthening in-country training programs as well as making use of cross-country knowledge-sharing forums and benchmarking tools to improve capability of their organisations. The new organisations could also mitigate their commercial risks through early engagement with the regulators by means of a pre-licensing process. The Forum has considered several scenarios of new organisations and their impact on the resources of the different stakeholders.

Ambitious national and international nuclear energy programs driven by the drive towards zero carbon emissions and energy security concerns will require significant levels of skilled human resources. An increase in the number of SMR vendors is driving an increased demand for nuclear skilled and experienced resources across the nuclear industry as a whole (including regulators) and will require both short and long term solutions. Short term solutions could include innovative solutions such as shared resources models but in the longer term education and training will play a key role in ensuring all the knowledge gaps are being bridged.

Capability of a Licensee related to nuclear activities is dictated by the schedule of activities it is undertaking at any particular stage of the project and the required capabilities will change throughout the project phases/lifecycle. The assessment of Licensee capability for oversight of supply chain is not an exact science and is inherently objective/outcome based in nature and could reside in house with the Licensee or could be contracted out to a vendor. There are well established approaches for assessing capability which have been applied for many years and have been effective in the assessment of capability for large NPPs and would be suitable for SMRs with some targeted improvements. Capability assessment is conducted through assessment followed by a judgement decision in which benchmarking plays a key role. Regulators, when looking to develop their approaches for assessment of capability, can leverage other regulators' standards and approaches and those of the IAEA. In countries where SMRs are being deployed, sources of benchmarking and identification of best practices will accumulate over time.

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LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|------|----------------------------------------------------------|
| CFSI | counterfeit fraudulent suspect items |
| CNRA | Committee on Nuclear Regulatory Activities |
| FAT | Factory Acceptance Testing |
| FOAK | a first of a kind |
| MCCO | Manufacturing, Construction, Commissioning and Operation |
| NHSI | Nuclear Harmonisation and Standardisation Initiative |
| NPP | nuclear power plant |
| SMR | Small Modular Reactor |
| WG | working group |

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