



ONR GUIDE			
COMMISSIONING OF SECURITY SYSTEMS AND INFRASTRUCTURE			
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1. INTRODUCTION

- 1.1 The Office for Nuclear Regulation (ONR) has established a set of Security Assessment Principles (SyAPs) (Reference 7). This document contains Fundamental Security Principles (FSyPs) that dutyholders must demonstrate have been fully taken into account in developing their security arrangements to meet relevant legal obligations. The security regime for meeting these principles is described in security plans prepared by the dutyholders, which are approved by ONR under the Nuclear Industries Security Regulations (NISR) 2003 (Reference 1).
- 1.2 The term 'security plan' is used to cover all dutyholder submissions such as nuclear site security plans, temporary security plans and transport security statements. NISR Regulation 22 dutyholders may also use the SyAPs as the basis for Cyber Security and Information Assurance documentation that helps them demonstrate ongoing legal compliance for the protection of Sensitive Nuclear Information (SNI). The SyAPs are supported by a suite of guides to assist ONR inspectors in their assessment and inspection work, and in making regulatory judgements and decisions. This Technical Assessment Guidance (TAG) is such a guide.

2. PURPOSE AND SCOPE

- 2.1 This TAG contains guidance to advise and inform ONR inspectors in exercising their regulatory judgment during assessment activities relating to a dutyholder's arrangements to ensure their security systems are subject to appropriate commissioning. It aims to provide general advice and guidance to ONR inspectors on how this aspect of security should be assessed. It does not set out how ONR regulates the dutyholder's arrangements. It does not prescribe the methodologies for dutyholders to follow in demonstrating they have addressed the SyAPs. It is the dutyholder's responsibility to determine and describe this detail and for ONR to assess whether the arrangements are adequate.

3. RELATIONSHIP TO LICENCE AND OTHER RELEVANT LEGISLATION

- 3.1 The term 'dutyholder' mentioned throughout this guide is used to define 'responsible persons' on civil nuclear licensed sites and other nuclear premises subject to security regulation, a 'developer' carrying out work on a nuclear construction site and approved carriers, as defined in NISR. It is also used to refer to those holding SNI.
- 3.2 NISR defines a 'nuclear premises' and requires 'the responsible person' as defined to have an approved security plan in accordance with Regulation 4. It further defines approved carriers and requires them to have an approved Transport Security Statement in accordance with Regulation 16. Persons to whom Regulation 22 applies are required to protect SNI. ONR considers supply chain management to be an important component of a dutyholder's arrangements in demonstrating compliance with relevant legislation.

4. RELATIONSHIP TO IAEA DOCUMENTATION AND GUIDANCE

- 4.1 The essential elements of a national nuclear security regime are set out in the Convention on the Physical Protection of Nuclear Material (CPPNM) (Reference 4) and the IAEA Nuclear Security Fundamentals (Reference 3). Further guidance is available within IAEA Technical Guidance and Implementing Guides.
- 4.2 Fundamental Principle J of the CPPNM refers to quality assurance and states that a quality assurance policy and quality assurance programmes should be established and implemented with a view to providing confidence that specified requirements for all

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activities important to physical protection are satisfied. The importance of issues relating to quality assurance is also recognised in the Nuclear Security Fundamentals, specifically:

- Essential Element 12: Sustaining a Nuclear Security Regime – 3.12 A nuclear security regime ensures that each competent authority and authorised person and other organisations with nuclear security responsibilities contribute to the sustainability of the regime by:
 - a) Developing, implementing, and maintaining appropriate and effective integrated management systems including quality management systems; and,
 - h) Routinely performing assurance activities to identify and address issues and factors that may affect the capacity to provide adequate nuclear security, including cyber security, at all times.

4.3 A more detailed description of the quality assurance is provided in Recommendations level guidance, specifically Nuclear Security Series (NSS) 13, Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5) (Reference 2). This document states “The quality assurance policy and programmes for physical protection should ensure that a *physical protection system* is designed, implemented, operated and maintained in a condition capable of effectively responding to the *threat assessment* or *design basis threat* and that it meets the State’s regulations, including its prescriptive and/or performance based requirements.”

5. RELATIONSHIP TO NATIONAL POLICY DOCUMENTS

- 5.1 The SyAPs provide ONR inspectors with a framework for making consistent regulatory judgements on the effectiveness of a dutyholder’s security arrangements. This TAG provides guidance to ONR inspectors when assessing a dutyholder’s submission demonstrating they have effective processes in place to achieve SyDP 4.4 – Commissioning, in support of FSyP 4 – Nuclear Supply Chain Management. The TAG is consistent with other TAGs and associated guidance and policy documentation.
- 5.2 The HMG Security Policy Framework (SPF) (Reference 5) describes the Cabinet Secretary’s expectations of how HMG organisations and third parties handling HMG information and other assets will apply protective security to ensure HMG can function effectively, efficiently and securely. The security outcomes and requirements detailed in the SPF have been incorporated within the SyAPs. This ensures that dutyholders are presented with a coherent set of expectations for the protection of nuclear premises, SNI and the employment of appropriate personnel security controls both on and off nuclear premises.
- 5.3 The Classification Policy (Reference 6) indicates those categories of SNI, which require protection and the level of security classification to be applied.

6. ADVICE TO INSPECTORS

- 6.1 Commissioning is the activity of setting to work systems and associated infrastructure, including assuring all systems and components are designed, installed, tested, operated, and maintained according to the Operational Requirements (ORs) of the owner. A commissioning process may be applied to new projects and existing systems, subject to modifications or significant maintenance. The scale of the commissioning activity should be proportionate to the level of complexity and degree of impact that the

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project will have on the site or facility's ability to meet its security outcome as defined in Annexes C and D of SyAPs.

- 6.2 This TAG is aimed at providing guidance to the inspector when assessing the adequacy of the commissioning arrangements demonstrated through the performance of the equipment (and those personnel who will manage, operate and maintain it) and the adequacy of the procedures to support the operation of that equipment. As part of this process, early engagement with dutyholders is essential in order to fully understand their proposals, assess the quality and completeness of the activities and measure the compliance of the plant and systems with the Physical Protection System (PPS) outcome and postures. This engagement should have been on-going throughout the development of the project. The commissioning activity is the first opportunity to confirm the performance of the installation and its contribution to meeting relevant security objectives.
- 6.3 This TAG should also be used to consider circumstances when security equipment is being removed at a dutyholder's site, when the site is being progressively being decommissioned.

Regulatory Expectation

- 6.4 The regulatory expectation is that dutyholders demonstrate in the security plan how they implement proportionate commissioning plans which should include clear definition of roles and responsibilities, performance indicators, availability of resources and clearly defined decision points (to be met prior to moving to the next phase), as appropriate. Where the plant and systems form a part of an existing infrastructure, the inspector should expect to identify that a risk assessment has been undertaken to review the potential impact on security caused by the commissioning of the new (or refurbished) equipment. Planned mitigation of any associated risks should also be evidenced.

FSYP 4 - Reliability, Resilience and Sustainability	Commissioning	SyDP 4.4
Before bringing into operation or returning to service any facility, system or process that may affect security it should be subject to testing and a commissioning plan defined in the security plan.		

7. THE COMMISSIONING PROCESS

- 7.1 Commissioning activity should be much more than simply setting plant and equipment to work. The effectiveness of security equipment to meet PPS postures and outcomes described in SyAPs requires the integration of a wider range of assets to support the operation of security equipment. This may include uninterruptable and possibly alternative power supplies such as diesel generators, to secure reliable performance. Commissioning should provide evidence and demonstrate that all aspects of the wider infrastructure operate as planned in both normal and fault conditions to confirm operational resilience.
- 7.2 Commissioning is typically broken into two parts, usually termed 'cold' and 'hot' commissioning. The former usually demonstrates the completeness of the plant and systems. It confirms that all components are installed, connections made and plant labelled. Evidence should be available to show this process has been undertaken and appropriate 'snagging', to put things right, has been expedited or completed.

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- 7.3 'Hot' commissioning refers to a phase when the plant and systems are energised. It is when the actual performance of the individual plant components is demonstrated and confirmed against their specified performance. This is followed by component integration into systems together with the human response elements. The final combination of the different systems into the overall infrastructure should prove the effectiveness of the installation, and whether it meets the intent and achieves the success criteria described in the ORs or equivalent.
- 7.4 Integral to this 'hot' commissioning phase is the record of commissioning activities. The inspector should expect comprehensive records to be kept on this phase of the programme. These capture the settings for plant components to deliver the system performance and may need to correlate with the 'as tested' settings in the case of Centre for the Protection of National Infrastructure approved security equipment for example. The base settings are important in confirming equipment remains fit for purpose, and to enable straightforward fault finding, and system re-commissioning later in its life. A package of information should be delivered which also includes a set of 'as built' drawings, operating, test and maintenance procedures and requirements, a recommended spares holding and other pertinent information.
- 7.5 Commissioning plant represents the penultimate step towards operation. The inspector should seek evidence from the dutyholder that the original ORs, or equivalent, are met throughout the different phases of commissioning. Evidence of any changes (and associated justifications to support them), should be available from the dutyholder.
- 7.6 The introduction of new or revised security equipment and systems, impacts on the approved security plan in that it represents a change to the approved arrangements. It would be expected that these changes are, as necessary, captured in any Security Improvement Schedule (SIS), itself a part of the approved security plan.
- 7.7 The inspector should ensure that the dutyholder is preparing the appropriate submission to seek approval for modifying the security plan (and the SIS) in order to reflect the changes to the arrangements delivered by the new plant and systems when this is necessary.
- 7.8 The introduction of new plant and systems should be subject to extant local facility modification procedures to ensure the impact of this new equipment on both existing safety and security systems is understood and approved. The inspector should seek evidence of this being done prior to 'hot commissioning' being undertaken.

8. COMMISSIONING AND PERSONNEL

- 8.1 Plant and equipment are material parts of the security infrastructure. However, personnel and associated processes are similarly important. Accordingly, the identification of Suitably Qualified and Experienced (SQEP) human resource to manage and operate this new equipment is necessary to deliver the capability. It is essential, therefore, to seek evidence that all these aspects are being or have been addressed in the commissioning programme.

9. COMMISSIONING AND MAINTENANCE

- 9.1 Security infrastructure should provide an effective and reliable system to deliver the required PPS posture and outcome. Accordingly, the long-term reliability of systems must be underpinned by an appropriate Examination, Inspection, Maintenance and Testing (EIMT) regime and spares holdings. This is supported by the provision of operating and maintenance manuals to describe those activities required to support

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system performance and the schedule for component replacement. Often the manufacturer will provide a recommended spares holding to support system reliability.

- 9.2 The dutyholder should be able to demonstrate a EIMT strategy has been developed and is in place. It may include provision of in-house resources or contracted services to support the strategy. The inspector should seek confirmation that the dutyholder has the appropriate funding identified to support the long-term operation and maintenance of the equipment or plant being commissioned.

10. COMMISSIONING AND TRAINING

- 10.1 Where appropriate, the training of staff linked to delivery of security outputs associated with the plant, equipment and systems being commissioned should also be demonstrated. The 'cold' commissioning phase offers a good opportunity to review the adequacy of the training of operational personnel, the availability of operating procedures and the proposed integration of the plant and systems into the existing security infrastructure. This can be considered as a 'readiness review'. The inspector should expect a positive decision point within the dutyholder's plan that approves a move to the next phase of commissioning and written justification of such a decision.

Inspectors should consider:

- Does the new equipment enable the dutyholder to achieve the required PPS outcome?
- Is the commissioning process underpinned by appropriate levels of internal and external stakeholder engagement and adequate ORs or equivalent?
- Are all appropriate stakeholders involved during the actual commissioning process?
- Are there appropriate plans and procedures in place to support the commissioning process and the introduction of any new or amended processes or procedures?
- Is the commissioning process supported by adequate numbers of SQEP personnel (managers, operators and maintainers)?
- Have whole life maintenance and training requirements been adequately considered during the commissioning process?
- Are there contingency plans if security equipment is not commissioned on schedule or fails to achieve the specified level of performance?
- Where necessary, has security equipment being commissioned been incorporated within extant security plans, and has re-approval of the plan been sought?
- Does the commissioned equipment meet defined performance requirements and if not what is the response of the dutyholder?
- Is commissioned equipment appropriately reliable and resilient?

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11. REFERENCES

1. **Nuclear Industries Security Regulations 2003**. Statutory Instrument 2003 No. 403
2. **IAEA Nuclear Security Series No. 13**. Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (**INFCIRC/225/Revision 5**). January 2011. www-pub.iaea.org/MTCD/Publications/PDF/Pub1481_web.pdf.
3. **IAEA Nuclear Security Series No. 20**. Objective and Essential Elements of a State's Nuclear Security Regime. http://www-pub.iaea.org/MTCD/Publications/PDF/Pub1590_web.pdf
4. **Convention on the Physical Protection of Nuclear Material (CPPNM)**
<https://ola.iaea.org/ola/treaties/documents/FullText.pdf>
5. **HMG Security Policy Framework**.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/710816/HMG-Security-Policy-Framework-v1.1.doc.pdf
6. **NISR 2003 Classification Policy**
<http://www.onr.org.uk/documents/classification-policy.pdf>
7. **Security Assessment Principles** – Trim Ref. 2017/121036

Note: ONR staff should access the above internal ONR references via the How2 Business Management System.

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12. GLOSSARY AND ABBREVIATIONS

CPPNM	Convention on the Physical Protection of Nuclear Material
EIMT	Examination, Inspection, Maintenance and Testing
FSyP	Fundamental Security Principle
IAEA	International Atomic Energy Agency
NISR	Nuclear Industries Security Regulations
NSS	Nuclear Security Series
ONR	Office for Nuclear Regulation
OR	Operational Requirement
PPS	Physical Protection System
SIS	Security Improvement Schedule
SNI	Sensitive Nuclear Information
SPF	Security Policy Framework
SQEP	Suitably Qualified and Experienced
SyAP	Security Assessment Principle
SyDP	Security Delivery Principle
TAG	Technical Assessment Guide