



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire



Workshop on Amendments to the *Nuclear Security Regulations*

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January 31, 2017

e-Doc: 5113970

Canada 



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Focus of Today's Workshop

- This workshop will focus on vendors, licensees and other interested stakeholders who have expressed an interest in the possible construction and deployment of small modular reactors (SMRs) in Canada
- There will be an opportunity for discussion on potential changes to security requirements for SMRs that use Category I, II or III nuclear material as defined in the *Nuclear Security Regulations* (NSR)



Today's Goals

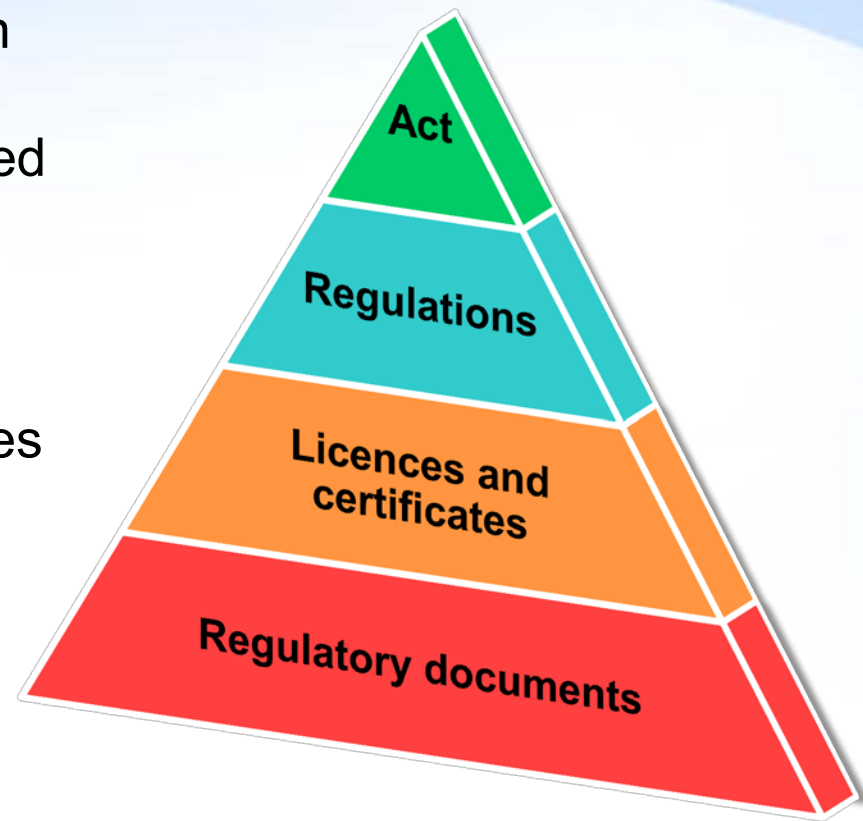
- Provide an overview of the CNSC's regulatory framework
- Provide an overview of several proposed amendments that CNSC staff is considering making to the NSR and receive preliminary feedback from stakeholders
- Provide an opportunity for stakeholders to suggest additional areas for potential amendments to the NSR

Please note that this is a CNSC staff assessment for prompting early discussion



The Regulatory Framework

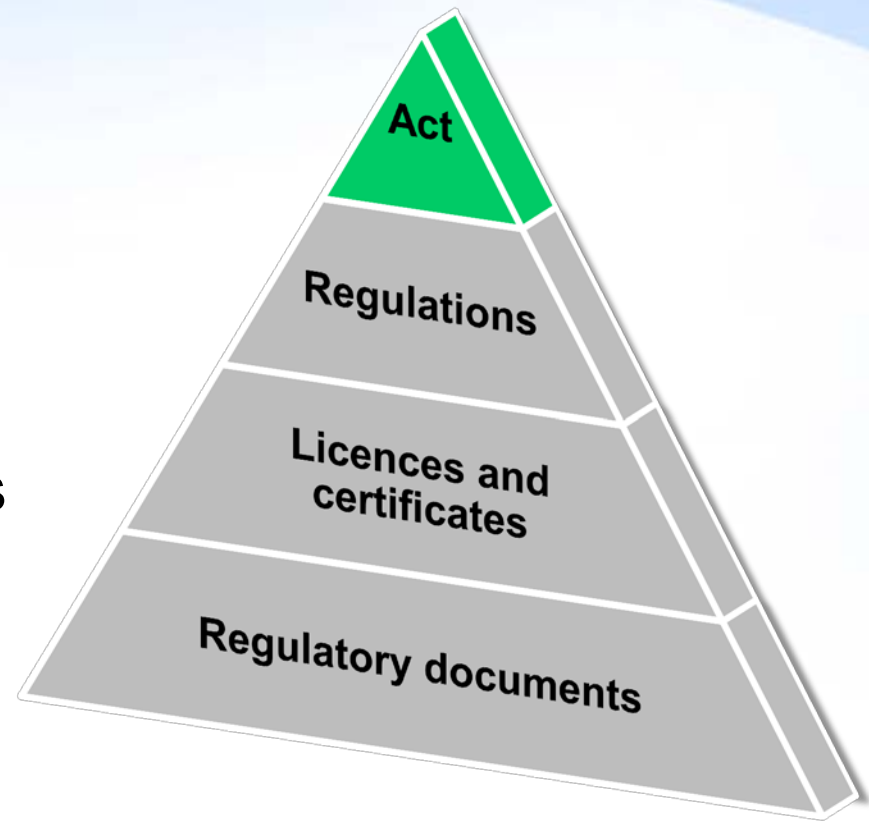
- **Act** – the *Nuclear Safety and Control Act* (NSCA) is the enabling legislation
- **Regulations** – the NSCA is supported by legally binding requirements established in regulations
- **Licences and Certificates** – set the mandatory requirements that licensees must meet to retain their licences
- **Regulatory documents** – provide information (in greater detail than regulations) on what licensees and applicants must achieve to meet the CNSC's regulatory requirements





Nuclear Safety and Control Act

- NSCA and associated regulations in force since 2000
- Sets out the legal framework that established the Commission and its authority and responsibilities, and allows the CNSC to make regulations
- Establishes the power to licence, inspect and enforce





Regulations

Regulations of general application

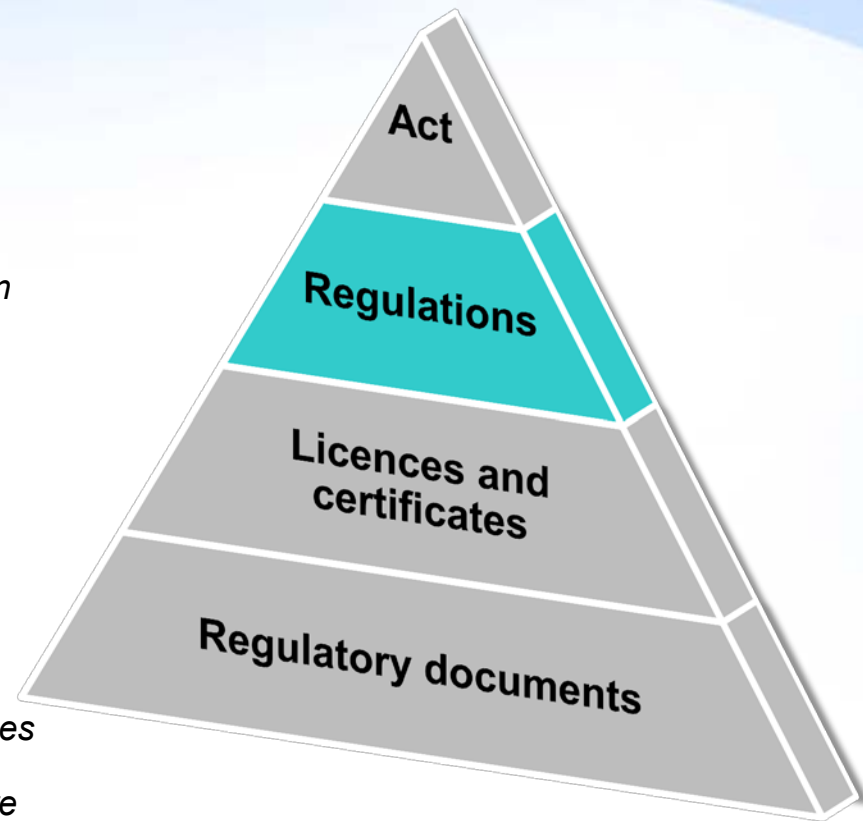
- *General Nuclear Safety and Control Regulations*
- *Radiation Protection Regulations*
- *Nuclear Security Regulations*
- *Packaging and Transport of Nuclear Substances Regulations*
- *Nuclear Non-Proliferation Import and Export Control Regulations*
- *Administrative Monetary Penalties Regulations (Canadian Nuclear Safety Commission)*

Facilities and Uses

- *Class I Nuclear Facilities Regulations*
- *Class II Nuclear Facilities and Prescribed Equipment Regulations*
- *Uranium Mines and Mills Regulations*
- *Nuclear Substances and Radiation Devices Regulations*

Other

- *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations*
- *Canadian Nuclear Safety Commission Rules of Procedure*
- *Canadian Nuclear Safety Commission By-laws*





Nuclear Security Regulations

- High-security site is defined as:
 - nuclear power plant or
 - nuclear facility where Category I or II nuclear material is processed, used or stored
- Part 1 – Security of Certain Nuclear Material and Nuclear Facilities
 - this Part applies in respect of Category I, II and III nuclear material and a nuclear power plant
 - sections 7.4 to 38 apply in respect of high-security sites
- Part 2 – Security of Nuclear Facilities Listed in Schedule 2
 - applies to facilities listed in Schedule 2



Licences and Certificates

Licences

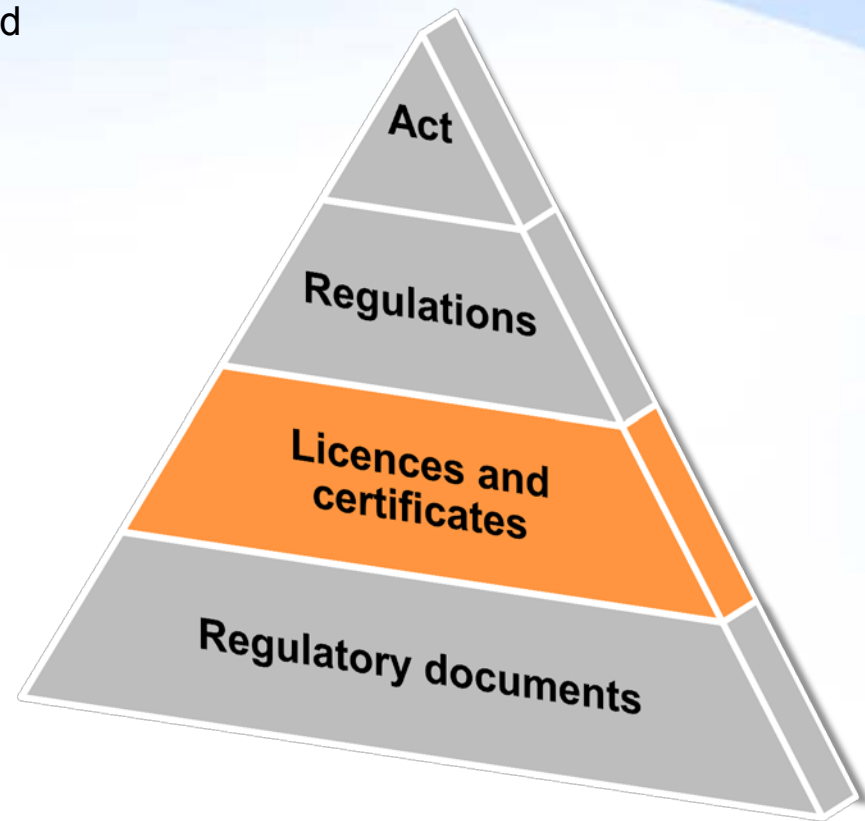
- The CNSC assesses applications for licences, and issues a licence if the applicant is deemed to be capable to operate safely
- Once issued, the company or corporation (could also be a person) becomes a CNSC licensee

Licence conditions

- Licensees are required to comply with all applicable regulatory requirements, including Licence conditions
- Licence conditions handbooks (LCHs) provide further explanation of licence conditions

Certificates

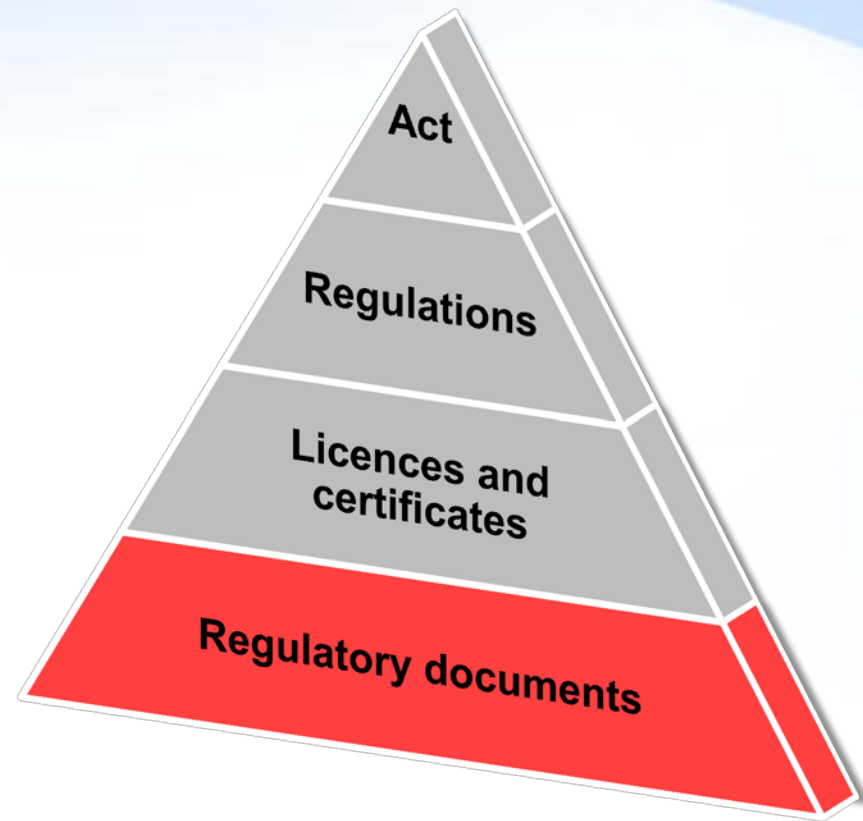
- The CNSC issues certificates indicating that a nuclear device or person working in the nuclear sector or a transportation package meets specific requirements





Regulatory Documents

- Clarify requirements
- Provide guidance on how to comply with requirements
- Developed through consultation





Regulatory Document Series

2.12 (Security)

Document number	Document title
RD-321	<i>Criteria for Physical Protection Systems and Devices at High-Security Sites</i> (document contains prescribed information)
RD-361	<i>Criteria for Explosive Substance Detection, X-ray Imaging, and Metal Detection Devices at High-Security Sites</i> (document contains prescribed information)
REGDOC-2.12.1	<i>High-Security Sites: Nuclear Response Force</i> (document contains prescribed information)
REGDOC-2.12.2	<i>Site Access Security Clearance</i>
REGDOC-2.12.3	<i>Security of Nuclear Substances: Sealed Sources</i>
G-208	<i>Transportation Security Plans for Category I, II or III Nuclear Material</i>
G-274	<i>Security Programs for Category I or II Nuclear Material or Certain Nuclear Facilities</i>



Regulatory Approach to Reactor Facilities

- CNSC requirements set performance objectives that applicants must meet
 - structure enables a license applicant for a reactor facility to propose alternative ways to meet safety objectives
 - requirements and guidance for reactor facilities are, where practical, technology-neutral and permit the use of a graded approach
- Licensing process
 - is risk-informed and independent of reactor technology or size
 - requires proposals to demonstrate that they are equivalent to or exceed regulatory requirements

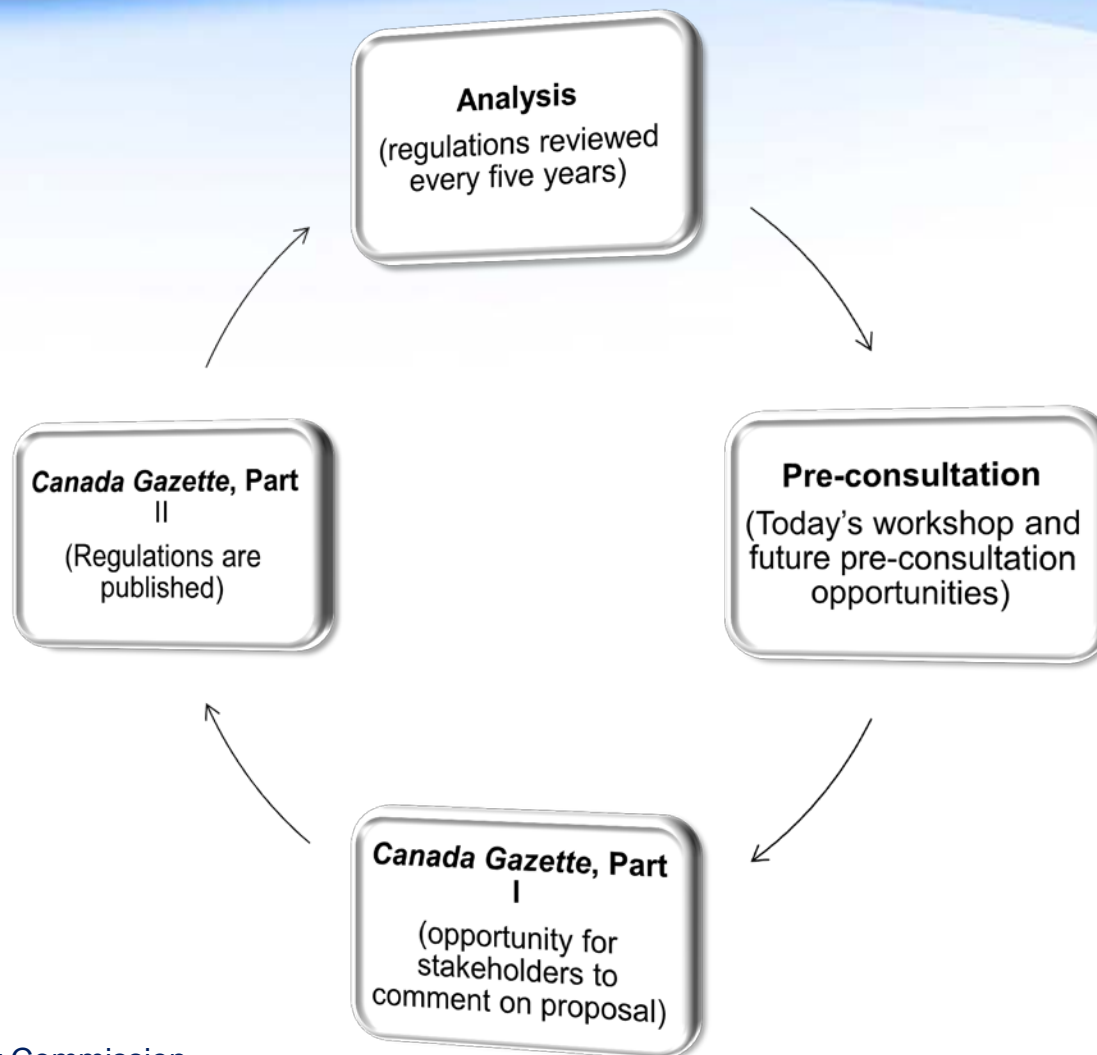


Regulatory Amendments

- As part of its periodic review of regulations, the CNSC is currently reviewing the *Nuclear Security Regulations* for potential amendments
- Objectives of review:
 - ensure the regulations continue to fulfill their role in effectively addressing Canada's nuclear security
 - ensure Canada continues to fulfill its international obligations in regards to the security of nuclear and radioactive materials



Overview of Regulatory Amendment Process





Context: Previous Consultation (Discussion Paper DIS-16-04)

- DIS-16-04, *Small Modular Reactors: Regulatory Strategy, Approaches and Challenges*
 - provided an overview of potential regulatory issues associated with SMRs and how they could be addressed
 - section 2.16, Site security provisions, discusses several challenges
 - alternative approaches to security, such as security by design
 - flexibility of the *Nuclear Security Regulations*



Context: Previous Consultation (Cont'd)

- What we heard
 - no insurmountable roadblocks to licensing small modular reactors under the existing regulatory framework
 - amendments to the *Nuclear Security Regulations* could be considered, for example
 - the *Nuclear Security Regulations* enable a graded approach to security; however, they specifically require onsite security officers and an onsite nuclear response force, which may be challenging for small and/or remotely located reactors
 - current regulations do not allow a licensee to propose a facility that would employ a fully engineered security features in conjunction with an offsite response force
 - traditional size of security staff might pose a significant burden on small plants; the inherent SMR design could result in a reduced need for staff
 - the threat-risk-assessment could be used to justify a small security force



Context: Changes Since Last Amendments

- Last major amendments to NSR published in 2006
- Operational experience
 - opportunity to amend regulations based on industry and CNSC operational experience gained in the past 10 years
- Evolving security environment
 - security threats continue to emerge, change, and evolve (e.g., cyber, insider)
- Technology advancements
 - regulations should allow new security technology to be implemented in a timely manner by licensees when appropriate (e.g., digital fingerprints, body scanners)



Context: Changes Since Last Amendments (Cont'd)

- New international recommendations, guidance, and best practices
 - amendment to the *Convention on the Physical Protection of Nuclear Material*
 - publication of new International Atomic Energy Agency (IAEA) Nuclear Security Series recommendations
 - potential lessons learned and recommendations/suggestions from recent International Physical Protection Advisory Service mission report



Overview of Potential Changes and Amendments

1. Simplified layout of the NSR
2. Performance-based approach to the NSR
3. Cyber security program
4. Protection of nuclear security information
5. Nuclear security plan
6. Nuclear security culture
7. Effective interface – safeguards, safety and security
8. Nuclear material accountancy and control



Overview of Potential Changes and Amendments (Cont'd)

9. Protection of workers and visitors
10. Controlled area definition – legal authority of NSOs
11. Security monitoring room
12. Personnel Security Standard reference update
13. Transportation of nuclear material
14. Update to nuclear security officer duties
15. Update to definition for potential adversary
16. Suggestions for amendments, updates, etc.



1. Simplified Layout of the NSR

- **Proposed amendment**
 - propose to lay out the NSR in modular format
 - for example, in the case of high-security sites, all requirements that apply to these types of facilities will be listed concurrently
- **Why is this under consideration?**
 - current layout makes it challenging to find out what regulatory requirements apply to what facility
 - for example, requirements that apply to Category III nuclear material are found in both Parts 1 and 2
- **Potential impacts**
 - no anticipated cost impacts
 - improved clarity



2. Performance-Based Approach to the NSR

- **Proposed amendment**
 - considering a performance-based approach where it makes sense to do so
 - regulations to set high-level security requirements
 - technical requirements and guidance to be moved to regulatory documents
 - examples
 - S.9 Barrier Enclosing Protected Area
 - S.10 Unobstructed Area Surrounding Protected Area
 - S.11 Protected Area Intrusion Detection
- **Why is this under consideration?**
 - provides flexibility for licence holders or applicants to propose an acceptable approach to meeting requirements
- **Potential impact**
 - no anticipated cost impact



3. Cyber Security Program

- **Proposed amendment**
 - establish a cyber security program to protect nuclear security, safety, safeguards and emergency preparedness systems against cyber attacks
 - consider cyber threats as part of the design basis threat analysis and site-specific threat and risk assessment conducted by licensees
- **Why is this under consideration?**
 - cyber security is one of the fastest growing threats to critical infrastructure in Canada
 - IAEA recommendation
 - Nuclear Security Series No. 20 – section 3.12 (h)
 - Nuclear Security Series No. 13, section 4.10
 - 2015 International Physical Protection Advisory Service mission report
- **Potential impact**
 - medium impact, but noted that a number of high-security site licensees are already in the process of establishing cyber security programs



4. Protection of Nuclear Security Information

- **Proposed amendment**
 - appropriately protect critical and/or sensitive nuclear security information by setting out high-level requirements for the protection and classification of information, the unauthorized disclosure of which could compromise or place at risk the security of nuclear material and/or facilities at high-security sites
 - include cyber media for the processing, storing and transmitting of nuclear security information



4. Protection of Nuclear Security Information (Cont'd)

- **Why is this under consideration?**
 - without requirements, there is considerable risk and a likelihood that nuclear security information will be disclosed to unauthorized parties
 - licensees use a mix of terms, labels and approaches to protecting information
 - assist in implementing consistent protection approaches within the nuclear industry
 - protection of sensitive, prescribed, and classified information to protect national security
 - to meet international fundamentals (NSS 20)
- **Potential impact**
 - depends on the licensee, as some have already implemented programs to protect nuclear security information



5. Nuclear Security Plan

- **Proposed amendment**
 - all security-related information required by the current NSR that is listed or described in several locations such as the site plan, security equipment, systems and procedures, barriers, protected areas, on and offsite response forces be located in one section of the NSR
 - G-274 will be amended to provide updated guidance
 - further, this information will be consolidated into one document by licensees, which will be called a nuclear security plan



5. Nuclear Security Plan (Cont'd)

- **Why is this under consideration?**
 - reflect IAEA recommendations for nuclear security
 - mix of terms used now including security report, site security report, site security plan, etc.
 - simplify the layout of the regulations and update/clarify security related information that has to be submitted by either applicants or nuclear operators
- **Potential impact**
 - minimal, no increase in cost versus what is currently being done



6. Nuclear Security Culture

- **Proposed amendment**
 - licensees of high-security sites would be required to implement a nuclear security culture program
 - establish and implement a nuclear security culture program
- **Why is this under consideration?**
 - the IAEA has identified the need for licensees, regulators, and states to establish an effective nuclear security culture with the goal of providing greater assurance that nuclear security activities will maintain and improve the following: preventing, detecting, delaying and responding to theft, sabotage, unauthorized access, illegal transfer, or other malicious acts involving radioactive material in use, storage, or transport



6. Nuclear Security Culture (Cont'd)

- **Why is this under consideration? (cont'd)**
 - Fundamental Principle F, “Security culture” – Amended *Convention on the Physical Protection of Nuclear Material*
 - IAEA definition: Nuclear security culture – The assembly of characteristics, attitudes and behaviors of individuals, organizations and institutions which serves as means to support, enhance and sustain nuclear security
- **Potential impact**
 - requires further discussion to assess impact on licensees, likely limited impact as this can be accomplished through a “corporate culture” that embraces security and safety culture in one program or as a stand-alone program that is equivalent to the safety culture program



7. Effective Interfaces – Safeguards, Safety and Security

- **Proposed amendment**
 - effective interfaces between safeguards, safety and nuclear security systems, staff and operations
- **Why is this under consideration?**
 - IAEA recommendations
 - Nuclear Security Series No. 13, section 4.11
 - Nuclear Security Series No. 20, section 3.12(a)
 - 2015 International Physical Protection Advisory Service mission report
- **Potential impact**
 - minimal, as licensees already have such interfaces in place



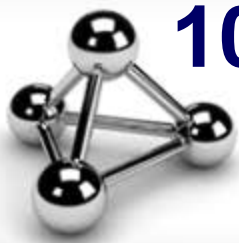
8. Nuclear Material Accountancy and Control

- **Proposed amendment**
 - accountability for nuclear materials
 - prompt reporting of any discrepancy in material accounting to site security (security and safeguard interface)
 - protect nuclear material accountancy and control (safeguard) systems from cyber attack as previously referenced in slide # 11
- **Why is this under consideration?**
 - IAEA recommendations
 - Nuclear Security Series No. 13, sections 3.26 and 4.10
- **Potential impact**
 - no anticipated cost impacts



9. Protection of Workers and Visitors

- **Proposed amendment**
 - establish and maintain effective intervention and response plans and procedures to protect workers/visitors
- **Why is this under consideration?**
 - insider threat (e.g., lone wolf), workplace violence, active shooter phenomenon have all contributed to this area having to be addressed
- **Potential impact**
 - medium impact, but noted that a number of high-security site licensees are already in the process of or have established security programs in this topical area



10. Controlled Area Definition – Legal Authority of Nuclear Security Officers

- **Proposed amendment**
 - define what a controlled area is and set up legal authority for Nuclear security officers within the controlled area
- **Why is this under consideration?**
 - to ensure that the licensee has the legal authority to implement the appropriate nuclear security measures within the controlled area
 - licensees have requested clearly defined authorities within the controlled area
 - evolving threat
 - defence in depth
- **Potential impact**
 - minimal, as existing high-security licensees have implemented various security measures within controlled areas



11. Security Monitoring Room

- **Proposed amendment**
 - provide a definition for a security monitoring room
 - provide higher-level security requirements that a security monitoring room must meet
- **Why is this under consideration?**
 - current security monitoring room requirements require updating as well as clarification
 - many of the prescriptive technical requirements can be moved to a regulatory document and updated as or when required
 - assist new licence applicants in understanding the critical role that the security monitoring room provides for the nuclear security system
- **Potential impact**
 - minimal, as existing high-security licensees have acceptable security monitoring rooms in place



12. Personnel Security Standard Reference Update

- **Proposed amendment**
 - update Personnel Security Standard reference to current document
- **Why is this under consideration?**
 - current government security policy references must be updated
 - seeking licensee feedback on the preferred way to accommodate these changes
 - e.g, provide for a transition clause within the amended NSR
 - changes to security screening in the areas of digital fingerprinting and the expansion of credit checks is required in the most recent personnel security standard and are being phased in over the next two years
- **Potential impact**
 - this has a direct impact both financially and operationally on licensees



13. Transportation of Nuclear Material

- Section 5 of the NSR provides the high level requirements for a transportation security plan
 - in addition, Regulatory Guide G-208, *Transportation Security Plans for Category I, II or III Nuclear Material*, provides detailed guidance for licensees
- No amendments are currently being considered to section 5
 - the CNSC's view is that section 5 provides the necessary requirements given the current threat environment
 - depending on stakeholder feedback our current plan is only to update the content of G-208 in consultation with licensees and the public
- As part of this workshop we would request licensee feedback on how they feel this section is working



14. Update Nuclear Security Officer Duties

- **Proposed amendment**
 - update nuclear security officer (NSO) duties (reference section 30 – NSR) for both armed and unarmed officers to reflect current duties
- **Why is this under consideration?**
 - this section requires updating and clarification
 - current NSR are focused on protected area and make no mention of NSO duties in other owner-controlled areas
- **Potential impact**
 - none, as NSOs are carrying out the required duties to meet current regulatory requirements



15. Update Definition of Potential Adversary

- **Proposed amendment**
 - update definition of potential adversary to include current threat factors to the Canadian nuclear industry
- **Why is this under consideration?**
 - to ensure licensees as well as the public understand the broad range of threat characteristics that must be considered when implementing nuclear security measures at high-security sites
- **Potential Impact**
 - to be confirmed depending on the results of the design-basis threat analysis



16. Suggestions for Additional Amendments, Updates

- Do you have any additional suggestions for potential amendments or improvements to the *Nuclear Security Regulations*, including how they could be structured?



Group Work Sessions

- Now that we have provided some potential amendments to the NSR, we would appreciate your feedback
- Your name cards indicate a meeting room number where you will discuss feedback in groups.
 - CNSC staff will guide conversations and record feedback
 - a summary of the feedback will be posted on the CNSC's website
 - prescribed information may be discussed during the course of the workshop and will be handled in accordance with regulatory requirements
- Designate one person in your group to present a summary of the feedback



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