REGDOC-2.1.2, *Safety Culture*

Commission Meeting, March 15 2018, CMD 18-M11.A

PURPOSE

TO REQUEST APPROVAL OF

REGDOC-2.1.2, *Safety Culture*

PRESENTATION OUTLINE

- Regulatory Document Framework

- Introduction & Background

- REGDOC-2.1.2 & Current Engagement

- Consultation

- Implementation & Oversight Strategy

- Conclusion & Recommendation

Canada's Nuclear Regulator

Management System:
Safety Culture

REGDOC-2.1.2

March 2018

Canadian Nuclear Safety Commission — Commission canadienne de sûreté nucléaire

Canada
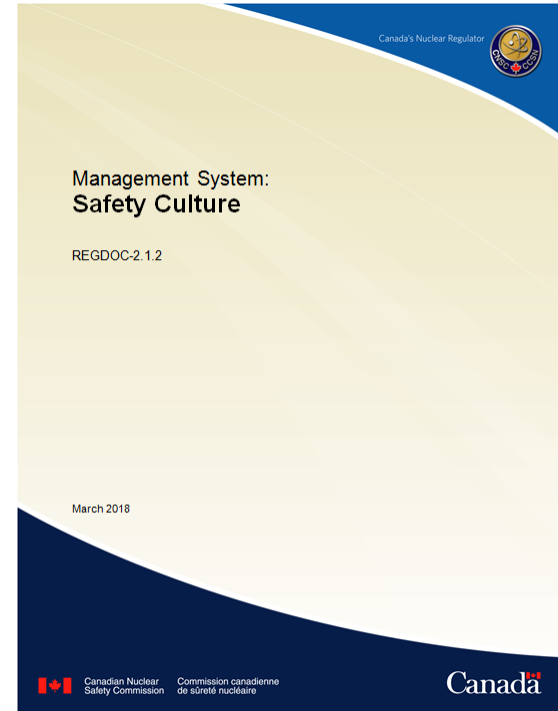
CNSC REGULATORY DOCUMENT FRAMEWORK

1.0 Regulated facilities and activities

2.0 Safety and control areas

2.1 Management system

   2.1.1   Management System

   2.1.2   Safety Culture

2.2 Human performance management

2.3 Operating performance

2.4 Safety analysis

2.5 Physical design

2.6 Fitness for service

2.7 Radiation protection

3.0 Other regulatory areas

2.8 Conventional health and safety

2.9 Environmental protection

2.10 Emergency management and fire protection

2.11 Waste management

2.12 Security

2.13 Safeguards and non-proliferation

2.14 Packaging and transport

Information sharing/protection*

Knowledge and competencies

Proactive

Commitment to safety

Recognition of risk

Reporting

Learning from experience

Questioning attitude

Credible threat*

Safety Culture

Open communication

Engagement

Leadership

Trust

Respect

Decision making

Screening practices*

Continual improvement

Change management

Perceptions

Shared understanding

How Safety is Realized in Everyday Work

Security Culture

Safety Culture

Information sharing/protection*   Knowledge and competencies

Proactive   Commitment to safety   Recognition of risk

Reporting

Learning from experience

Credible threat*   Questioning attitude

Open communication

Engagement   Leadership

Trust   Respect

Decision making

Screening practices*   Continual improvement

Change management   Perceptions   Shared understanding

How Safety is Realized in Everyday Work

e-Doc: 5429554 (PPT)
e-Doc: 5469114 (PDF)

Commission Meeting, March 15 2018, CMD 18-M11.A

6

Safety Culture & Security Culture Coexist

EVENTS LEADING TO SAFETY CULTURE LEARNING

- Major events in the nuclear industry:
  - Chernobyl
  - Tokai-Mura
  - Davis Besse
  - Fukushima

- Major non-nuclear events:
  - Space shuttles Challenger & Columbia
  - Deepwater Horizon
  - Lac Mégantic

- Major security event:
  - 9/11

Beyond the Technical Risks into Human and Organizational Issues

IAEA DOCUMENTS ON SAFETY CULTURE

International Atomic Energy Agency (IAEA) has been publishing safety culture documents since the 1990s, including:

- Safety Standards Series No. SF-1, *Fundamental Safety Principles* (2006)

- *General Safety Requirements (GSR) Part 2 Leadership and Management for Safety* (2016)

- *Safety Series No. 75-INSAG 4-Safety Culture* (1991)

- Safety Standards Series No. GS-G-3.5, *The Management System for Nuclear Installations* (2009)

- *Safety Report Series 83: Performing Safety Culture Self-assessments* (2016)

- Nuclear Security Series No. 7, *Nuclear Security Culture* (2008)

- INSAG-24, *The Interface Between Safety and Security at Nuclear Power Plants* (2010)

CNSC BACKGROUND IN SAFETY CULTURE (1)

- Research in support of developing a method to assess safety culture (Mid 1990s)

- CNSC performed 11 assessments using this method (1997—2009)

- CNSC held a Symposium on Safety Culture (2004)
  - Distributed Draft Guidance for Licensee Self-Assessment of Safety Culture

- CNSC implemented the IAEA *Code of Conduct on the Safety and Security of Radioactive Sources* (2006)
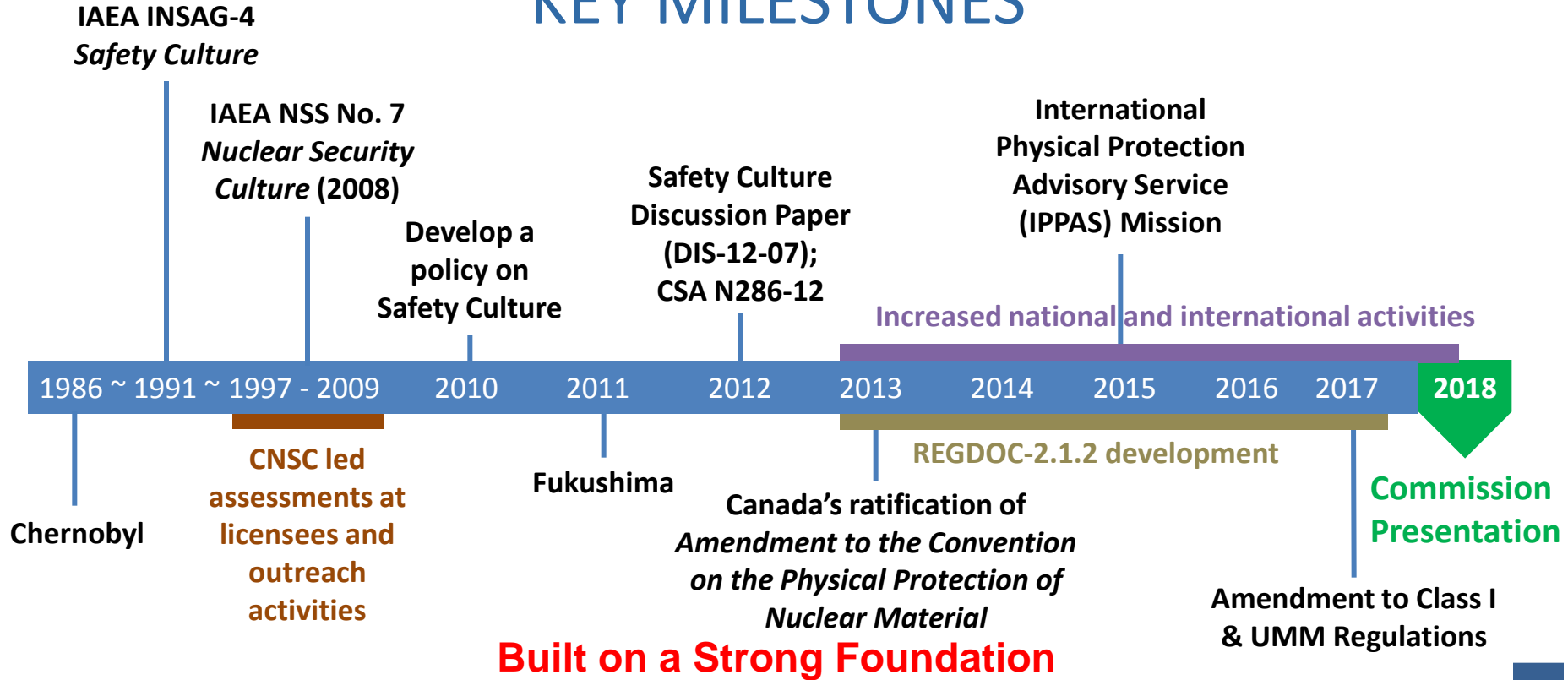
CNSC BACKGROUND IN SAFETY CULTURE (2)

- Oversight activities (1997—today)
  - Engage licensees to foster a healthy safety culture
  - Trend events and inspection reports for safety culture
  - Site inspectors observe licensees' daily work
  - On-site review of licensees' self-assessment practices including corrective action plans

KEY MILESTONES

IAEA INSAG-4 *Safety Culture*

IAEA NSS No. 7 *Nuclear Security Culture* **(2008)**

Develop a policy on Safety Culture

Safety Culture Discussion Paper (DIS-12-07); CSA N286-12

International Physical Protection Advisory Service (IPPAS) Mission

Increased national and international activities

| 1986 ~ | 1991 ~ | 1997 - 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | **2018** |

CNSC led assessments at licensees and outreach activities

REGDOC-2.1.2 development

Fukushima

Chernobyl

Canada's ratification of *Amendment to the Convention on the Physical Protection of Nuclear Material*

Amendment to Class I & UMM Regulations

Commission Presentation

Built on a Strong Foundation

REGULATORY OVERSIGHT OF LICENSEES' SAFETY CULTURE

Policy-like approach

- Prescribing the goal setting objective for fostering, monitoring and assessing; similar to ALARA (As Low as Reasonably Achievable)

- Lay the basis that support:
  - Understanding
  - Learning
  - Improving

IAEA TECDOC 1707 *Regulatory Oversight of Safety Culture in Nuclear Installations*

OBJECTIVES FOR REGDOC-2.1.2

- Engage all licensees to foster, monitor, and assess safety culture

- Enhance the CNSC's regulatory framework
  - Document CNSC regulatory expectations concerning fostering a healthy safety culture
  - Provide clear and explicit information to all existing and potential licensees on what requirements or guidance is applicable

REGDOC-2.1.2
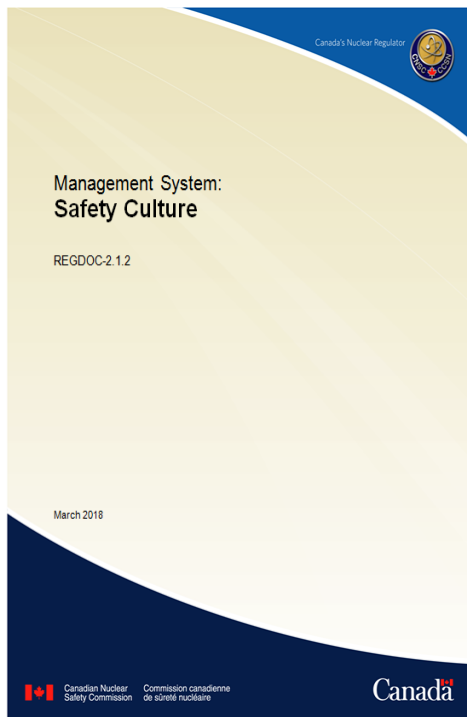
1. Introduction
2. Fostering Safety Culture
3. Safety Culture Assessments

   Appendices

e-Doc: 5429554 (PPT)
e-Doc: 5469114 (PDF)

REGDOC-2.1.2 PRINCIPLES (1)

Principle 1: Every organization has a safety culture

Principle 2: Safety culture is influenced by external and internal factors including all workers

Principle 3: Safety culture is complex and changes over time

Informed by IAEA Safety Report Series No. 83 *Performing Safety Culture Self-assessments.*

REGDOC-2.1.2 PRINCIPLES (2)

Principle 4: Safety culture needs to be assessed and monitored to achieve the common goal of understanding the organization's safety culture and limiting risk

Principle 5: Safety culture assessment and improvement activities are informed by a defined framework of key characteristics known to reflect a healthy culture

Informed by IAEA Safety Report Series No. 83 *Performing Safety Culture Self-assessments.*

REGDOC-2.1.2 REQUIREMENTS (1)

Requirement: Fostering a healthy safety culture

> "Licensees shall document their commitment to fostering safety culture in their governing documentation"

Guidance:

- Safety culture governance documentation
- Ongoing monitoring of safety culture
- Safety Culture Maturity Model – Appendix B (overview)

Will Apply to All Class I Facilities, and Uranium Mines and Mills (UMM)

REGDOC-2.1.2 REQUIREMENTS (2)

Requirement: Assessing safety culture

"Licensees shall conduct comprehensive, systematic and rigorous safety culture assessments at least every five years"

Guidance:

- Safety Culture Assessments
- Safety Culture Reference Framework – Appendix A
- Safety Culture Maturity Model – Appendix B (overview)

Will Apply Only to Nuclear Power Plants (NPPs)

CLASS I & UMM CURRENT ENGAGEMENT

- Basic building blocks in place
  - CSA N286-12 clause 4.2 documenting and monitoring safety culture

- Processes and methods exist for assessing safety culture; however they could be enhanced
  - IAEA (2016) Safety Report Series 83, *Performing Safety Culture Assessments*
  - Ongoing collaboration on safety and security culture both domestically and internationally
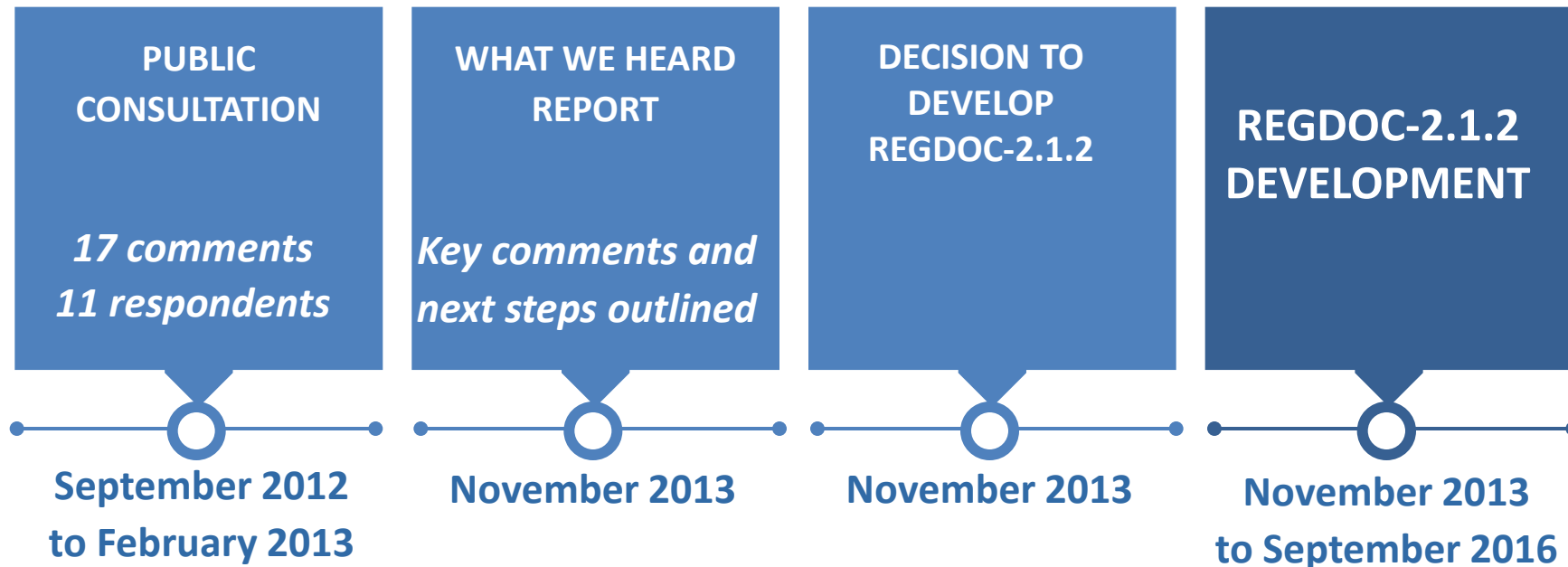
ENGAGING NUCLEAR SUBSTANCE AND CLASS II LICENSEES

- REGDOC-2.1.2 provides foundational information and references

- *Appendix C: Safety Culture Maturity Model Indicators and Specific Behaviours* provides a useful initiation tool

PUBLIC CONSULTATION – PHASE 1

| PUBLIC CONSULTATION

17 comments
11 respondents | WHAT WE HEARD REPORT

Key comments and next steps outlined | DECISION TO DEVELOP REGDOC-2.1.2 | REGDOC-2.1.2 DEVELOPMENT |

September 2012 to February 2013   **November 2013**   **November 2013**   **November 2013 to September 2016**

PUBLIC CONSULTATION – PHASE 2

PUBLIC CONSULTATION	STAKEHOLDER WORKSHOP	REVISED DRAFT SENT TO STAKEHOLDERS	REGDOC-2.1.2 submitted to Commission for approval
169 comments 13 respondents	*27 external participants*	*26 comments 11 respondents*	
September 2016 to April 2017	June 2017	November 2017 to January 2018	March 2018

Extensive Consultation with Stakeholders

KEY CONCERNS RAISED DURING PUBLIC CONSULTATION

Scope	Definitions and Frameworks	Security Culture Integration	Periodic Safety Culture Assessments	Maturity Model
1	**2**	**3**	**4**	**5**

e-Doc: 5429554 (PPT)
e-Doc: 5469114 (PDF)

Commission Meeting, March 15 2018, CMD 18-M11.A
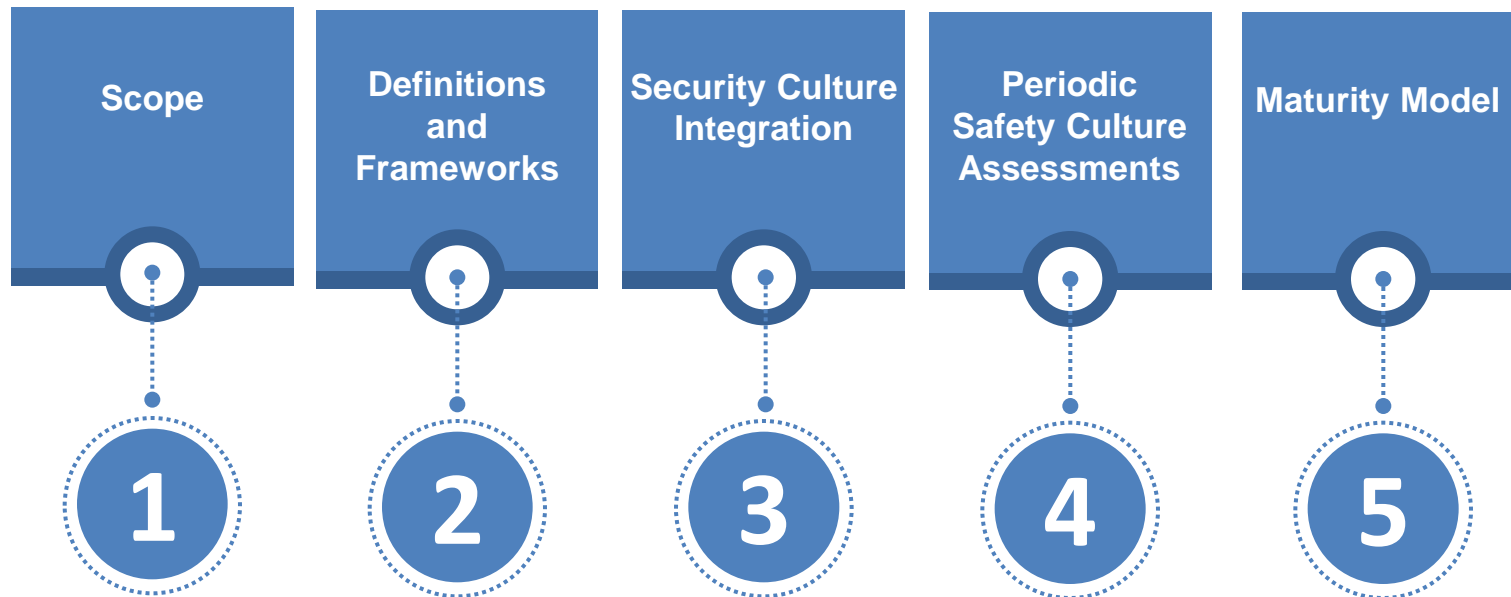
Stakeholders' concern:

- The REGDOC was unclear on the application of requirements and guidance for different types of licensees

CNSC staff response:

- The REGDOC was modified to include clear statements in each section concerning which requirements and guidance apply to which licensees

2 DEFINITIONS AND FRAMEWORKS

Stakeholders' concern:

- The REGDOC used a different safety culture definition and reference framework than those used by industry

CNSC staff response:

- Various safety culture definitions, including the CNSC's, highlight similar elements and have similar goals
- Licensees have flexibility to use definitions and frameworks that meet the intent of those in the REGDOC

3 SECURITY CULTURE INTEGRATION

Stakeholders' concern:

- Stakeholders objected to the inclusion of security culture in this REGDOC
  - Separate concept from safety and lack of maturity

CNSC staff response:

- Safety and security culture need to coexist and are mutually supporting
- The REGDOC text was revised to clarify the relationship
- For the assessment, flexibility to integrate or separate safety and security culture

Stakeholders' concern:

- The REDOC requirement to conduct "empirical, valid, practical, and functional" safety culture assessments was problematic
  - Quantitative approach ("scoring system") allowing comparison between licensees

CNSC staff response:

- Following stakeholder outreach, requirement was revised to "comprehensive, systematic and rigorous"
  - Robust qualitative and quantitative methods aiming at a self-discovery/reflection process

4 PERIODIC SAFETY CULTURE ASSESSMENTS (2)

Stakeholders' concerns:

- The REGDOC required safety culture assessments every three years (inflexible and impractical)
- The REGDOC required the submission of a summary report to the CNSC (administrative burden, potential to affect future assessments)

CNSC staff response:

- Frequency changed to at least every five years
  - Additional assessments should be conducted as needs dictate
- Submission of summary reports removed
  - CNSC staff review safety culture reports on site

5 MATURITY MODEL (1)

An introspective tool to gauge where an organization is at present, and where it would like to be

Stage 1: Requirement-driven

Safety is primarily reactive and driven by formal rules and management direction.

Stage 2: Goal-driven

Good safety performance becomes an organizational objective and is dealt with primarily in terms of safety goals.

Stage 3: Continually improving

Safety is seen as a continually improving and proactive process, beginning with all workers sharing a clear vision of and value for safety.

5 MATURITY MODEL (2)

Stakeholders' concerns:
- **NPPs:** The maturity model should be removed as it included an implied second set of safety culture indicators
- **Class II and nuclear substance licensees:** The detailed maturity model provided useful information

CNSC staff response:
- Overview information for all licensees provided in Appendix B
- Specific indicators kept for Class II and nuclear substance licensees in Appendix C

IMPLEMENTATION

If approved:

- The REGDOC will be published and made available to licensees and stakeholders

- CNSC staff will follow the standard implementation process for REGDOCs
  - Class I nuclear facilities and uranium mines and mills will receive a letter requesting a gap analysis and implementation plan
  - Class II and nuclear substance licensees will be informed of the publication of REGDOC-2.1.2 with a recommendation that they use Appendix C

REGULATORY OVERSIGHT OF LICENSEES' SAFETY CULTURE

- ## Continuing and strengthening existing practices
  - Engage licensees to foster a healthy safety culture
  - Trend events and inspection reports for safety culture
  - Site inspectors observe licensees' daily work
  - On-site review of licensees' self-assessment practices including corrective action plans

Commission Meeting, March 15 2018, CMD 18-M11.A

CONCLUSION

REGDOC-2.1.2, *Safety Culture:*

- Built upon the CNSC knowledge and experience
- Aligned with national and international practices
- Developed through research and extensive consultation
- Engages licensees to foster, monitor and assess for continual improvement of safety performance
- If approved, will improve clarity and strengthen CNSC's framework

RECOMMENDATION

CNSC staff recommends that the Commission approve REGDOC-2.1.2, *Safety Culture*

e-Doc: 5429554 (PPT)
e-Doc: 5469114 (PDF)

Connect With Us

Thank You! Questions?

nuclearsafety.gc.ca