Canadian Nuclear Safety Commission

Commission canadienne de sûreté nucléaire

Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held on June 22-23, 2016

Canada

Minutes of the Canadian Nuclear Safety Commission (CNSC) meeting held Wednesday June 22, beginning at 14:05, and Thursday June 23, 2016, beginning at 9:00, at the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, ON.

Present:

M. Binder, President
A. Harvey
D. D. Tolgyesi
R. Velshi
Dr. S. McEwan

M. Leblanc, Secretary
D. Saumure, Senior Counsel
S. Dimitrijevic and M. Hornof, Recording Secretaries

CNSC staff advisors were: R. Jammal, G. Frappier, C. Moses, R. Awad, J. Burtt, K. Lafrenière, B. Poulet, M. Santini, G. Lamarre, P. Lahaie, G. Giobbe, H. Rabski, L. Sigouin, C. Croy, D. Wallace, S. Faille, S. Mortimer, K. Glenn, M. Leblanc, S. Gingras, M. Hornof, P. Fundarek, A. Régimbald, H. Tadros, R. Lojk, M. Langdon, J. LeClair, P. Elder, J. Jin, K. Owen-Whitred, C. Pike, S. Fundarek, K. Heppell-Masys, B. Torrie

Other contributors were:

- OPG: R. Manley
- Cameco: M.A. Charette, L. Mooney, K. Nagy, S. Harriman
- Saskatchewan Ministry of Labour Relations and Workplace Safety: L. Kaskiw
- CNL: B. Pilkington, D. Cox, S. Cotnam, B. Sanderson
- Denison Mines: I. Ludgate

Constitution

1. With the notice of meeting CMD 16-M19 having been properly given and all permanent Commission members being present, the meeting was declared to be properly constituted.

2. Since the meeting of the Commission held on April 6 and 7, 2016, Commission member documents CMD 16-M19 to CMD 16-M29, CMD 16-M32, CMD 16-M33 and CMD 16-M36 were distributed to members. These documents are further detailed in Annex A of these minutes.

Adoption of the Agenda

3. The revised agenda, CMD 16-M20.B, was adopted as presented.

Chair and Secretary

4. The President chaired the meeting of the Commission, assisted by M. Leblanc, Secretary, and S. Dimitrijevic and M. Hornof, Recording Secretaries.

Minutes of the CNSC Meeting Held April 6 and 7, 2016

5. The minutes of the April 6 and 7, 2016 Commission meeting were presented in CMD 16-M21. The Commission requested clarification and updates on the following items.

6. The Commission requested that paragraph 40 of CMD 16-M21 be clarified and expanded to more accurately reflect the April 2016 Commission meeting discussion regarding the applicability of the bystander effect to different populations.

7. In regard to the event in Kakrapara, India, reported in paragraph 44 of CMD 16-M21, the Commission requested a follow-up with information on the cause of the event. CNSC staff agreed to provide the Commission with a memo on this matter when the information was available. **ACTION** by December 2016

8. Regarding paragraph 45 of CMD 16-M21, the Commission noted that no mechanism for an update on the stop work order from the Ministry of Labour in relation to a worker injury at the Bruce Nuclear Generating Station (NGS) had been provided. The Commission directed CNSC staff to provide it with an update on this matter during the Status Report on Power Reactors at the August 2016 Commission meeting. **ACTION** by August 2016

9. The Commission members approved the minutes of the April 6 and 7, 2016 Commission meeting as presented in CMD 16-M21, with the changes as noted.

STATUS REPORTS

Status Report on Power Reactors

10. With reference to CMD 16-M23, the Status Report on Power Reactors, CNSC staff informed the Commission about the status of nuclear power reactors at Canadian NGS. CNSC staff noted that, although CMD 16-M23 stated that a licensing decision for the Gentilly-2 NGS was pending, a power reactor decommissioning licence had been issued by the Commission to Hydro-Québec on June 22, 2016. The licence is valid until June 30, 2026.

11. The Commission enquired about the recent news release from the Organisation régionale de la sécurité civile de Québec regarding the discontinuation of the potassium iodide (KI) tablet pre-distribution/pre-stocking and exclusion zone emergency management requirements for the Gentilly-2 NGS.[1] The Commission asked whether this action completed the changes to emergency management requirements at the Gentilly-2 NGS, as identified at the May 2016 licensing hearing,[2] and whether CNSC staff had any concerns in this regard. CNSC staff responded that KI pre-distribution/pre-stocking and an exclusion zone were no longer required for the areas surrounding the Gentilly-2 facility. However, an emergency management zone remained within the boundaries of the Gentilly-2 facility. CNSC staff also confirmed to the Commission that the KI tablets were being disposed of appropriately and that CNSC staff did not have any concerns in regard to emergency management at Gentilly-2.

12. Noting that the reactor at the Point Lepreau NGS was operating at 92 percent following its restart from a planned maintenance outage, the Commission asked about when it would be back to operating at full power. CNSC staff provided information about the challenges that the Point Lepreau NGS had with debris in the heat exchangers after the restart and reported that the reactor should be operating at full power soon, when the work to clean heat exchangers was completed.

13. The Commission enquired about the planned maintenance outage durations at OPG facilities. The Ontario Power Generation Inc. (OPG) representative responded that the scopes of the outages at the Darlington and Pickering NGS were those of normal maintenance outages, with no safety-related issues having been identified. CNSC staff confirmed this information, noting that OPG had a good track record for complying with the original scope of work for outages.

14. The Commission requested additional details about the length of the outage of Unit 8 at the Pickering NGS. The OPG representative provided details on the outage and the maintenance work that was being conducted. CNSC staff provided information on outage scopes and potential reasons for longer outages. In an email update on June 23, 2016, OPG confirmed to the Commission that there had not been any slippage in the outage maintenance schedule and that OPG was on track to complete the outage by July 21, 2016.

[1] Organisation régionale de la Sécurité civile de Québec, Mauricie – Centre-du-Québec, *Communiqué de presse : Abolition du* Plan des mesures d'urgence nucléaire externe à la centrale nucléaire de Gentilly-2, May 26, 2016.
[2] CNSC *Record of Decision* – Hydro-Québec, "Demande d'un permis de déclassement d'un réacteur nucléaire de puissance pour Gentilly-2", May 5, 2016.

Canadian Nuclear Laboratories Limited (CNL): Status Report on the Fitness for Service for Chalk River Laboratories

15. With reference to CMD 16-M32, CNSC staff presented a Status Report that includes an initial update to the Commission regarding CNL's progress in regard to fitness for service for the Chalk River Laboratories (CRL). The "fitness for service" safety and control area (SCA) has been rated as "below expectations" since 2006, with 2009 being rated as "unacceptable". In its decision to renew the CRL licence, the Commission requested that CNSC staff report on the status of this SCA at each Commission meeting, until a satisfactory rating is achieved. This report focusses on the National Research Universal (NRU) reactor and Fissile Solution Storage Tank (FISST) that contributed to the "below expectations" fitness for service rating. CNSC staff reported that they have inspected and regularly reviewed the results of the implementation of improvements at CRL, as documented in the Integrated Implementation Plan (IIP), and concluded that CNL was making progress as required by licence condition 16.1 of the current licence.[3]

16. The Commission noted that, although this was the first CRL fitness for service status report, it did not contain any specific details regarding the progress made by CNL in this regard. CNSC staff committed to prepare a more detailed report for the next meeting of the Commission. — ACTION by August 2016

17. A representative from CNL added that the NRU reactor continues to operate safely and that the implementation of the IIP was continuing aggressively. The CNL representative illustrated CNL's commitment to achieve a satisfactory rating in the fitness for service SCA as soon as possible, detailing its investment in improvements at CRL since 2011. CNSC staff submitted additional data about its inspections at CRL and confirmed that the periodic inspection program for the NRU has been improved in terms of rigor and inspection results.

18. The Commission further noted that this SCA has been rated as below expectations for a long period of time and that the target date for achieving a satisfactory rating would be before the next licence renewal proceedings, tentatively in early 2018. The Commission reiterated its request that the reporting on this matter, with more definitive plans, actions and dates, be a standing requirement for the meetings of the Commission until the satisfactory rating is achieved.

[3] Canadian Nuclear Safety Commission Record of Decision – Canadian Nuclear Laboratories Limited – *Application to Renew and to Amend the Research and Test Establishment Operation Licence for Chalk River Laboratories*, July 6, 2016.

19. The Commission enquired about the meaning of the satisfactory rating in fitness for service in consideration of the planned permanent shutdown of the NRU reactor by the end of March 2018. CNSC staff responded that the fitness for service SCA considered the whole CRL site and therefore CNSC staff considered all site risks as well as the changes to the IIP that were made due to the planned shutdown of the NRU reactor at the end of March 2018. The CNL representative added that, although the production of molybdenum-99 would be on standby as of the end of October 2016, CNL would continue to operate the NRU reactor at high power to produce other isotopes and to conduct research until its end of life.

20. The Commission asked whether there is a well-defined set of criteria that CNL needs to meet in order to reach the satisfactory rating for the fitness for service SCA. CNSC staff responded that a set of criteria exists and that CNL was making progress towards meeting them. CNSC staff further noted that a below expectations rating in the fitness for service SCA is not the only indicator of safety and does not indicate unsafe conditions at the NRU reactor or at CRL.

21. The Commission expects that all issues with fitness for service at CRL should be resolved and a rating of satisfactory achieved before future licence renewals for CRL are granted and before any decisions regarding the end of life or life extension of the NRU reactor are made.

Event Initial Reports

Cameco Corporation and L.A. Trucking: Transport accident on April 17, 2016 involving uranium concentrate near Massey, Ontario

22. With reference to CMD 16-M26, CNSC staff presented information regarding a traffic accident involving a L.A. Trucking tractor trailer transporting uranium concentrate from Cameco's Blind River Refinery to its Port Hope conversion facility. The accident occurred on April 17, 2016 on the Trans-Canada Highway (Highway 17) near Massey, Ontario. L.A. Trucking and Cameco staff responded to the accident and reported it to the CNSC. As a result of the accident, the trailer sustained minor damage and the packages sustained no damage. L.A. Trucking was able to make the necessary repairs to the trailer on-site and the vehicle was sent back to the Cameco Blind River Refinery. There was no radiological impact on health and safety of persons and the

environment as a result of this event. Upon being notified of the accident, CNSC staff was in communication with Cameco and confirmed that their Emergency Response Assistance Plan (ERAP) was activated and that emergency response personnel were on their way.

23. The Commission enquired about a licensee's or transporter's obligation to report accidents resulting in minor or no consequences, such as the accident in this event. CNSC staff responded that any accidents involving vehicles that are specified in the *Packaging and Transport of Nuclear Substances Regulations, 2015*[4] (PTNSR) must be reported immediately to the CNSC. In the case of this event, the CNSC had been notified approximately one hour after the accident occurred. CNSC staff added that the PTNSR specifies that each carrier has to implement work and emergency response procedures, and that all drivers should be trained for emergency situations and accidents.

24. The Commission asked about the average number of uranium transport accidents that occurred per year. A representative from Cameco responded that, typically, there are one to two accidents of uranium transport accidents per year.

25. The Commission asked about verification procedures, requirements and training prerequisites regarding companies that were contracted to transport nuclear materials and whether Cameco has preselected transporters. The Cameco representative explained Cameco's selection criteria for contractors and noted that Cameco organizes annual refresher training and conducts training exercises every three years.

26. The Commission sought information regarding the fitness for duty of the driver involved in the accident. The Cameco representative responded that L.A. Trucking has a drug and alcohol policy in place. However, since the driver was found to not be at fault in this accident, drug or alcohol testing was not conducted.

Cameco Corporation: Worker injured on May 31, 2016 at Rabbit Lake operation

27. With reference to CMD 16-M33, CNSC staff informed the Commission about an accident during which a contracted worker sustained a head injury after falling from a scaffold at Cameco's Rabbit Lake operation. Following the accident, the worker was treated by the site nurse and then sent off-site to a Saskatoon

[4] Statutory Orders and Regulations S.O.R./2015-145

hospital for further assessment and treatment. After being treated, the worker was discharged from the Saskatoon hospital later the same day. CNSC staff further informed the Commission about Cameco's taken and planned actions, as well as the actions of CNSC staff. CNSC staff noted that the Saskatchewan Labour Relations and Workplace Safety had conducted a reactive inspection to the event on June 1, 2016. CNSC staff stated that additional reporting to the Commission was not anticipated.

28. The Commission requested additional details about the injury and asked whether the worker had returned to work. Cameco representative and CNSC staff provided a detailed description of the event and described all of the protective measures that were in place. Cameco representative also stated that the worker had returned to work the next day.

29. The Commission enquired about qualifications of the injured worker. The Cameco representative responded that the worker was qualified and competent to work with and on scaffolding, had several years of experience, and had recently obtained his certification as a ticketed scaffolder. The Cameco representative added that for this particular job, a hazard analysis had been conducted and that, following the event, Cameco conducted another job hazard analysis, with similar work not being resumed until it was completed and additional controls were put in place.

30. The Commission asked whether Cameco had conducted all the required investigation activities, submitted the required reports and communicated the event to other uranium mine and mill licensees. CNSC staff confirmed that all of these activities had been completed as required, with all reports submitted, and that Cameco had already informed all of the other licensed uranium mine sites about the event. CNSC staff added that they planned to conduct an inspection of the modifications that Cameco made to the scaffolding following the accident.

31. The Commission enquired about the worker insurance, including that for contractors, and compensation to workers in the case of lost time incidents. The Cameco representative responded that there is a workers' insurance system in place for all Cameco employees and contractors on site with all liability issues addressed via the workers' compensation mechanism. Although not the case in this event, if a worker injury results in lost time, the worker can apply to the provincial Workers Compensation Board for compensation. The Cameco representative added that Cameco's safety performance is defined for the entire licenced site, including

Cameco employees as well as contractors. Therefore, should a lost time incident occur, it would be reported in Cameco's safety statistics.

Canadian Nuclear Laboratories Limited: Incident on April 19, 2016 at Chalk River Laboratories during the reloading of a fuel basket containing spent fuel bundles from NRX (National Research Experimental) reactor

32. With reference to CMD 16-M27 and CMD 16-M27.A CNSC staff presented information regarding an accident involving the failure of a basket loaded with Highly Enriched Uranium (HEU) fuel from the NRX reactor. The fuel was dropped into the NRU reactor fuel rod bay. There were no health and safety impacts on workers or members of the public, or on the environment as a result of this event. The event occurred when a mechanical grapple released unexpectedly while the basket was moving. CNL is investigating the cause of the release. CNSC staff informed the Commission about the taken and planned actions, and committed to preparing a memo to the Commission with additional details on the event, as well as CNL's response to and CNSC staff's assessment of the event.

ACTION
by
March 2017

33. The Commission sought more details about the event and asked if the cause of the grapple release had been determined. CNSC staff provided a detailed description of the event, stating that CNL had conducted an investigation and had undertaken various corrective actions. A CNL representative explained its procedures for its maintenance and verification of mechanical parts used in underwater operations in the NRU reactor fuel rod bay. CNSC staff stated that they had inspected the site and were satisfied with the corrective actions taken by CNL. The Commission requested that, for better clarity, future presentations of such events be supported by schematics or photographs.

34. The Commission asked about how frequently this activity is performed and whether it is a routine activity. The CNL representative responded that this activity had been performed successfully four times before the accident occurred. Procedures for the activity had been developed in 2015, with further improvements through the implementation of corrective actions, including the video monitoring of the underwater operations. The CNL representative further stated that additional testing had confirmed that the mechanism was functioning properly.

35. The Commission asked if there were any operational implications for nuclear power plants (NPPs) resulting from the lessons learned in this event. CNSC staff responded that, since the use of

underwater video monitoring is common for operations in fuel bays, CNL would examine potential advantages and share useful operational experience with CANDU operators.

36. The Commission enquired about the potential for fuel damage during similar events. The CNL representative responded that this event was likely the only type of event that could occur during this operation, and that the potential for fuel damage was low due to the construction of the transport assembly.

Canadian Nuclear Laboratories Limited: Heavy water release on April 26, 2016 at the ZED-2 Research Reactor

37. With reference to CMD 16-M28 and CMD 16-M28.A, CNSC staff presented information regarding a heavy water release discovered at the Zero Energy Deuterium (ZED-2) facility at CNL's CRL in Chalk River, Ontario. The release was discovered during a quarterly heavy water inventory and was attributed to the premature closing of three isolation valves during the routine draining of heavy water from the reactor into dump tanks. CNSC staff reported that this event did not result in any adverse effects to persons or the environment, primarily due to the low tritium content of the heavy water, and the slow release and dissipation of the heavy water. CNSC staff submitted that the maximum estimated release of heavy water to the environment was equivalent to one hundred of a millionth of the regulatory public dose limit. CNSC staff informed the Commission about the actions that had been taken after the event and that were planned, noting that CNSC staff intends to prepare a memo to the Commission further detailing the event, CNL's response and CNSC staff's assessment.

ACTION by December, 2016

38. The Commission asked for clarification of the statement in CNSC staff's report regarding a possible gap in CNL's human performance management. The CNL representative responded that they had identified a gap in procedures related to the operation of the isolation valves. The gap had been recognized as a weakness and had since been corrected by providing more clarity in the operating instructions.

39. The Commission asked about the level of risk presented by this event. CNSC staff responded that the risk was very low, since the ZED-2 reactor operates at low power and the heavy water tritium concentration is very low. Therefore, the tritium releases into the environment would also be very low, regardless of the amount of heavy water released. The CNL representative added that CNL did not measure the tritium emissions at this facility, due to very low concentration of tritium. Routine tritium bioassays conducted on two persons involved in this event had not shown any detectable

uptakes of tritium related to operations of ZED-2.

40. The Commission enquired about heavy water recovered from the ventilation system. The CNL representative provided a detailed explanation of the procedure used to recover heavy water from the ventilation system. CNSC staff further stated that since CNL workers had been able to recover a significant amount of the heavy water found in the ventilation system, the actual amount of heavy water that was lost during the event had only been a fraction of what was originally estimated.

Denison Mines Inc.: Forest fire near Denison Mines' Property and Quirke Lake, Elliot Lake area, Ontario, on May 24, 2016

41. With reference to CMD 16-M36, CNSC staff presented information regarding a fire that took place in the vicinity of Denison Mines in the Elliot Lake, Ontario area. The fire covered an area of approximately three hectares and was about 100 metres away from the nearest tailings management area. CNSC staff provided details about the event and said that they had received the report from the Elliot Lake Fire Department. It had been determined that the fire was caused by a tree that had fallen onto a power line outside of the CNSC-licensed property. The fire did not damage any facilities at the site, with no workers or members of the public affected. CNSC staff also noted that other than the burning of some trees and shrubs, there was no other damage to the environment.

42. The Commission asked about the potential impact of the fire on the tailings management area. A representative from Denison Mines responded that there would be no impact on the tailings management area since it is decommissioned, with a one-metre water cover over the tailings.

43. The Commission sought clarification regarding the statement in the report that the fire department had contacted the Ontario Ministry of Natural Resources (MNR) to clarify responsibilities. The Denison Mines representative explained that there had initially been some doubt as to whether the fire was within the jurisdiction of the Elliot Lake Fire Department. It was decided that the Elliot Lake Fire Department needed support immediately with the MNR promptly dispatching manpower and equipment to the area.

44. The Commission enquired about the responsibility for maintenance around the power lines in the area. CNSC staff noted that the tree had fallen outside of the Denison Mines property and stated that Hydro One is responsible for tree clearing around the power lines, with the last clearing done in 2013. The Denison Mines

representative added that this issue would be addressed while they prepare the final report and lessons learned for the CNSC. CNSC staff stated that they will include the final report on this event in their Regulatory Oversight Report, as is the current practice.

ACTION by December 2016

INFORMATION ITEMS

Technical Briefing on Management Systems in the Nuclear Industry

45. With reference to CMD 16-M22, CNSC staff presented a technical briefing on the evolution of management systems in the nuclear industry. CNSC staff explained that the International Atomic Energy Agency (IAEA) and CSA Group standards for quality assurance of safety-related systems and activities had evolved to management system standards that held safety as the primary consideration in all activities. CNSC staff also provided information on management system structure and the CNSC's regulation of management systems.

46. The Commission requested additional information about the management system benchmarking that CNSC staff had carried out to determine that the CNSC was a world leader in setting regulatory expectations for licensee management systems. CNSC staff provided comparisons from the benchmarking exercises carried out against other IAEA member state regulators, noting that many of these regulators focused on the quality assurance of safety-related items and activities which make up only one part of integrated managements systems that the CNSC adopted in 2009. CNSC staff also noted that national benchmarking showed that several other Canadian regulators for high-reliability industries had also recently implemented management system requirements and that the CNSC was leading the implementation of these requirements in the nuclear sector.

47. The Commission enquired about how the IAEA enforced the adoption of its standards, noting that several countries considered in the benchmarking exercise had not yet implemented a management system. CNSC staff explained that, although the IAEA encouraged that the best practices detailed in its standards and guidance documents be adopted, it did not impose these on member states. CNSC staff also stated that many countries who did not have a management system applied IAEA guidance in alternate methods. CNSC staff further explained that the IAEA conducted Integrated Regulatory Review Service (IRRS) missions to review

member state regulators and evaluate how licensee requirements were being implemented. CNSC staff noted that the Convention on Nuclear Safety provided a forum for a peer regulatory review of international nuclear regulatory programs as well.

48. The Commission enquired about whether benchmarking had been conducted against current practices in the chemical industry, which is a known leader in management systems. CNSC staff responded that, although benchmarking against specific industries was not conducted, results showed that mature organizations had implemented management systems.

49. The Commission asked whether the management system requirements in Canada would be expanded beyond Class I and uranium mine and mill (UMM) licensees. CNSC staff responded that, at this time, CSA N286-12, *Management system requirements for nuclear facilities*[5] was primarily intended for Class I and UMM licensees. However, to ensure that all licensed activities were conducted safely with a strong management commitment to safety, the inclusion of key elements of a management system in Class II licensee radiation safety manuals was evaluated by CNSC staff.

50. The Commission enquired about how CNSC staff ensured that the management system requirements for Class II licensees that were part of larger organizations, such as hospitals and universities, did not conflict with the management system of the whole organization. CNSC staff responded that these requirements were complementary, rather than conflicting. CNSC staff also explained that, during CNSC staff review of licensee applications and programs, it ensured that radiation safety programs were put in place within these organizations and that there was strong senior management recognition of the importance of these programs.

51. The Commission expressed a concern that, in some larger organizations, the integration and complementarity of management systems and nuclear safety requirements could be weak. The Commission further stated that the governance models for universities and hospitals in regard to radiation safety culture and facility management systems should be discussed in greater detail at a future public meeting of the Commission. CNSC staff confirmed that this information would be discussed during an upcoming *Regulatory Oversight Report* presentation in September 2016 and that public consultation for the draft REGDOC-2.1.2, *Safety Culture for Nuclear Licensees*[6] would address this issue as well.

[5] CSA N286-12, *Management system requirements for nuclear facilities*, CSA Group, 2012.
[6] Draft CNSC Regulatory Document, REGDOC-2.1.2, *Safety Culture for Nuclear Licensees*.

52. The Commission asked about the accountability of an organization's leadership in regard to the management system and the IAEA's updated recommendations on this matter. CNSC staff responded that leaders in an organization were held accountable for the continued implementation of management systems and that the role of leadership was embedded into many management system areas. CNSC staff stated that IAEA GS-R-3, *The Management System for Facilities and Activities*,[7] emphasized that it was senior management's responsibility to ensure that an effective management system was in place. The IAEA has since updated this standard to IAEA GSR Part 2, *Leadership and Management for Safety*,[8] which further addressed leadership through expected behaviours and attributes. CNSC staff also explained that addressing management behaviours and attributes was becoming a best practice in other standards as well.

53. The Commission requested details about CNSC requirements for the expected behaviours and attributes of leaders of an organization to ensure the effective implementation of a management system. CNSC staff explained that the leaders of an organization were ultimately accountable for the implementation of the management system and provided the Commission with information regarding their responsibilities with respect to the performance of a facility.

54. The Commission further enquired about whether the CNSC could ensure that deficiencies in leadership were addressed through enforcement actions. CNSC staff responded that deficiencies in leadership often resulted in the poor performance of an organization in multiple safety and control areas. Through inspections and other CNSC regulatory activities, these deficiencies, including deficiencies in leadership, would be found and CNSC enforcement actions could be applied to ensure that the licensee corrected them.

55. The Commission enquired about the costs and effort required for an organization to implement an integrated management system. CNSC staff provided information on this matter, noting that organizations which had implemented management systems had realized significant cost and safety benefits. CNSC staff also stated that, although the CNSC began requiring management systems in 2009, Class I licensees had already implemented management systems at that time and had realized the cost and safety benefits of this approach.

[7] IAEA Safety Standards Series, Safety Requirements GS-R-3, *The Management System for Facilities and Activities*, July 2006.
[8] IAEA Safety Standards Series, General Safety Requirements No. GSR Part 2, *Leadership and Management for Safety*, June 2016.

56. The Commission asked whether any licensees had discontinued the use of a management system. CNSC staff responded that no licensee had discontinued the use of a management system and that CNSC staff did not anticipate this happening.

57. The Commission requested additional information about the benefits of management systems. CNSC staff responded that, although the management system benefits could be sector-specific, benefits that could be seen in all organizations included consistency; delivering on and meeting requirements and objectives; and demonstrating that an organization was meeting requirements.

58. The Commission requested additional information about the future CNSC REGDOC on management systems. CNSC staff responded that the REGDOC would reflect current management system requirements as detailed in licence conditions handbooks, while clarifying best practices and approaches to meeting requirements.

59. The Commission enquired about whether the REGDOC would align with the guidance in the IAEA's GSR Part 2. CNSC staff responded that the CNSC participated in the development of GSR Part 2 and that guidance for best practices in both documents would be aligned.

60. The Commission further enquired about harmonization between the requirements of the multiple management system standards, guidance and the proposed CNSC REGDOC. CNSC staff responded that there currently was harmonization between standards and guidance, and that the proposed REGDOC would be aligned with these as well. Information on how licensees could meet the requirements of all relevant guidance with a single approach was provided. CNSC staff noted that no standard required the implementation of a management system; this was recommended but, as a regulator, the CNSC required licensees to meet the requirements contained within the standards, which could be successfully achieved through various methods.

61. The Commission asked about how CNSC staff could be certain that CSA N286-12 reflected management system best practices. CNSC staff stated that, through its evaluation of the CSA N286-12, CNSC staff considered it to represent the nuclear industry's best practices in terms of management system implementation. The Commission recommended that, during the development of the REGDOC for management systems, CNSC staff examined the best practices of industries other than nuclear industry.

62. The Commission enquired about the CNSC's management system and how it aligned with the CSA and IAEA standards. CNSC staff provided information regarding the CNSC's management system, explaining that it was aligned with IAEA GS-R-3 and that it had been found to be adequate during an IRRS mission. CNSC staff also noted that self-assessments were regularly conducted on all of the CNSC's processes.

63. The Commission further enquired about how the CNSC's management system was aligned with the 14 safety and control areas (SCAs) and the processes related to the SCAs. CNSC staff provided details about this matter, noting that the 14 SCAs and the processes for the regulation of these SCAs were considered in the CNSC's management system.

CNSC Response to the Fires in the Fort McMurray Region

64. With reference to CMD 16-M29, CNSC staff presented a report on the actions taken by the CNSC following the May 2016 forest fires in the Fort McMurray region, Alberta. CNSC staff submitted that, following a request by the Alberta Provincial Emergency Operation Centre, CNSC staff had assessed all storage locations containing nuclear substances or radiation devices, and had determined that no nuclear substances or radiation devices had been compromised or destroyed by the fire. CNSC staff provided a detailed description of the onsite response by CNSC staff and inspectors, as well as information about CNSC licensees, radiation devices regulated by the CNSC, and permanent and temporary storage locations in the Fort McMurray area.

65. The Commission sought more information regarding the verification of the safety of storage locations for radioactive materials and devices. CNSC staff explained that the security requirements for nuclear substances and radiation devices, including the guidance in REGDOC-2.12.3,[9] include specific requirements for their appropriate storage, with multiple safety and security barriers. These requirements had been used by CNSC staff to verify and confirm the safety and security of permanent and temporary storage locations of the nuclear substances and radiation devices in the Fort McMurray area.

66. The Commission enquired about the resistance of radiography device containers to fire exposure. CNSC staff responded that radiography containers are certified as transport packages, which are designed to withstand severe accidents, including the exposure to high temperatures, such as in a forest fire. CNSC staff noted that

[9] Canadian Nuclear Safety Commission Regulatory Document *REGDOC-2.12.3: Security of Nuclear Substances: Sealed Sources*, 2014.

in temperatures higher than the stainless steel melting point (the container material), although some of the container may melt, enough shielding would be preserved that the radioactive source would remain contained. CNSC staff stated that in that situation, the emitted dose rates would be only slightly higher.

67. The Commission requested additional information about the safety of isotope generators in medical facilities. CNSC staff responded that the facilities at Fort McMurray had technetium generators located in the facility basements and that, due to small quantities of the isotopes produced and their short half-lives, the impact of these materials would be very limited.

68. The Commission enquired about the monitoring of and accounting for the radiation devices used by contractors from other parts of the country that are involved in activities within the affected area. CNSC staff responded that they had identified and contacted companies that have portable radiation devices and that could have been present in the affected area. This verification confirmed that none of these companies had been working in the area affected by the fire. CNSC staff emphasized that companies have a regulatory obligation to notify the CNSC of the exact location where they are operating, and that there is a requirement for the real-time tracking of all high-risk sources and that their locations are reported to the CNSC on a regular basis.

69. The Commission asked about the radiation protection training of firefighters and other first responders. CNSC staff responded that the CNSC offered training programs including radiological response training to hazmat teams, other first responders groups, as well as other government organizations. CNSC staff noted that while some first responders have received this training, which is offered on an “on request” basis, the Fort McMurray hazmat team had not received the training. The Commission stressed the importance of this training for first responders to ensure greater awareness about radiation hazards in similar events.

70. The Commission enquired about CNSC staff readiness and the availability of personal protective equipment for emergencies such as this event. CNSC staff responded that a job hazard analysis had been conducted and that all necessary equipment had been provided to CNSC staff working in the area affected by the fire.

71. The Commission requested information about the existing long-term waste management facility, currently under institutional control, which is located within the fire-affected area. CNSC staff responded that this site contains legacy wastes and represents an extremely low risk since all the radioactive material located at the

site is below licensable quantities. CNSC staff noted that, although the site does not require CNSC oversight, it is controlled and managed by CNL as part of the historic uses and legacy wastes that is managed as a liability to Canada.

72. The Commission expressed its satisfaction with CNSC staff's response to the Fort McMurray area fires and the actions taken, and enquired about potential further improvements, as well as about the reaction of the provincial authorities regarding other hazardous materials. CNSC staff responded that they had been cooperating with the federal government operation centre that had been collecting information from all agencies. CNSC staff added that the risks of chemical and other hazardous materials had been taken into account and that the federal and provincial environmental departments had allocated assets to support first responders for those types of events.

73. CNSC staff noted that some improvements could be made by enhancing the databases search capabilities, consolidating some databases that contain information on high-risk sources and other databases on the lower-risk sources. CNSC staff added that, regardless of the risk level, licensees are required to immediately report to the CNSC the loss of control of any of their radioactive sources.

Status of the Designated Officer Program: 2015

74. With reference to CMD 16-M24, CNSC staff presented a report on Designated Officer (DO) Program activities and the DO authorities carried out during the 2015 calendar year. The report summarized licensing and certification authorities, non-licensing authorities, and decisions reportable to the Commission. The report also provided information on the DO Training Program and planned improvements to the DO Program.

75. The Commission enquired about the timeline for making DO decisions and about the number of staff involved in the decision-making. CNSC staff responded that, for some decisions such as the review of orders or opportunities to be heard, the timelines are prescribed in the regulations, while for other decisions, CNSC staff commits to service standards and the performance against those service standards is reported on CNSC website. CNSC staff added that these standards are met about 95% of the time. In cases of urgency, CNSC staff applies a fast-track procedure which is completed within 24 hours. CNSC staff explained the role of specialists and project officers that are involved in reviewing information and making recommendations to the DO, who then makes the final decision.

76. The Commission asked about feedback that the CNSC had received from the licensees regarding their experiences with DOs. CNSC staff responded that the CNSC conducts regular licensee outreach activities, with licensees having the opportunity to provide feedback on this matter. The Commission further enquired about whether any complaints regarding DO decisions had been received and the nature of these complaints. CNSC staff responded that no requests for a review of the licensing decisions have yet been received; however, the *Nuclear Safety and Control Act* (NSCA) provides for an appeal mechanism, including Commission review of DO decisions, for licensees.

77. The Commission asked about the effectiveness of the DO Program and about how that effectiveness could be measured. CNSC staff responded that the number of requests for the Commission's review could be a measure of the effectiveness of the Program, and added that only three of the orders issued by the DOs in 2015 were reviewed by a panel of the Commission, with the results of the reviews published on CNSC website. CNSC staff also explained that the orders issued by CNSC inspectors are reviewed and confirmed, amended or revoked by the DOs. This process also includes an opportunity to be heard for the licensee receiving the order.

78. The Commission asked about DO qualifications. CNSC staff responded that only occupants of higher-level positions are eligible to become a DO. In the interview process for these higher-level positions, it is taken into consideration that the incumbent will also have DO authority, so that the experience and knowledge required to carry out the authorities are taken into account. CNSC staff added that the CNSC has established DO Program documents and processes, as well as work instructions to ensure the effective implementation of the DO Program.

79. The Commission sought additional details regarding specific decisions taken by the DOs, noting that the presented numbers of decisions did not differentiate between the confirmed, amended, revoked or replaced orders under each subsection of the section 37 of the NSCA. CNSC staff responded that more granular information was reported mostly in the Regulatory Oversight Report for Nuclear Substances prepared by the Directorate of Nuclear Substance Regulation (DNSR) as well as in reports of other directorates, and that the intention was to consolidate the data in this report.

80. The Commission suggested that, in the next annual reports, these statistical data be presented in more detail and be grouped by

specified actions. Data presented in such a manner would help the Commission to examine trends, as well as DO actions and decisions. This information would also help the Commission re-evaluate the DO positions that exist, if necessary. The Commission is of the view that the content and format of the DO Program Report, and policy issues associated with it, should be redefined at the CNSC Management Committee before the next meeting of the Commission dedicated to this report.

ACTION
by
April, 2017

81. The Commission further suggested that the DOs meet annually to share experiences from all the various branches and that attention should be paid to the training of the DOs, particularly related to legal aspects of their decisions. CNSC staff informed the Commission about mandatory training for the DOs who have the authority to issue orders and that the DOs receive the training from Legal Services on the NSCA and regulations.

DECISION ITEM

REGDOC-2.13.2, *Import and Export*

82. With reference to CMD 16-M25 and CMD 16-M25.A, CNSC staff presented to the Commission draft Regulatory Document REGDOC-2.13.2, *Import and Export*, and a recommendation for its approval for publication and use by CNSC staff. CNSC staff explained how this REGDOC fit within the CNSC Regulatory Document Framework and provided background information about the purpose of the document, its content, the public consultation report including key comments, and the proposed implementation strategy. CNSC staff noted that this document is essential to communicating to existing and prospective licensees the CNSC's regulatory program and controls for the import and export of nuclear substances, equipment and related information.

83. The Commission asked what radioactive materials were covered in this REGDOC. CNSC staff explained that, while the CNSC implements export and import controls in several different areas, this REGDOC mainly deals mainly with nuclear and nuclear-related dual-use items.

84. The Commission enquired about key concerns expressed by licensees regarding this document, and about the nature of these concerns. CNSC staff responded that the main concerns came from the mining industry and were related to the potential impact of the proposed changes in regard to the implementation of Canada's nuclear non-proliferation policy on their operations.

85. The Commission sought more information regarding the solution included in the REGDOC for the control of re-exporting foreign-origin uranium that had been brought to Canada for processing. CNSC staff explained the proposed changes to the implementation of Canada's nuclear non-proliferation policy in detail and the intention to make all export of foreign-origin uranium for nuclear use subject to the Nuclear Cooperation Agreement (NCA), noting that, currently, only the export of Canadian-origin uranium from Canada to the recipient country is subject to the NCA. CNSC staff informed the Commission about the functioning of the international cooperation on non-proliferation of nuclear substances through bilateral agreements and provided some examples to illustrate the differences in national policies regarding these issues.

86. CNSC staff also provided information regarding the comments and feedback that were received from the industry regarding the re-exportation of foreign uranium and informed the Commission about how the originally proposed changes to the policy implementation were modified. CNSC staff submitted that following these modifications, the REGDOC provides that only foreign uranium that is not already subject to a bilateral agreement will be made subject to the terms and conditions of a bilateral agreement between Canada and the recipient country, at the time of export. CNSC staff provided a schematic representation of the changes and explained mechanisms for their implementation. CNSC staff also informed the Commission about the transition period that would allow the CNSC to communicate the changes to foreign partners with whom the NCA would be implemented.

87. Referring to one of the key comments received during the public consultation, the Commission enquired about licensees' concerns regarding cloud technology and the control of intangible technology transfers, as well as the publication of sensitive research data. The Commission recognized the security implications of these activities and noted that there was very little guidance on these issues in the draft REGDOC. CNSC staff noted that cloud technology was a new area, and that it was working with its international partners to address this challenge. CNSC staff added that the intent of this REGDOC was primarily to consolidate existing practices. CNSC staff further added that this part of the REGDOC had been extensively discussed and it had been decided that the most appropriate approach would be to make all exporters aware that controlled nuclear information, as defined and listed in the *Nuclear Non-proliferation Import and Export Control Regulations*,[10] has to be controlled regardless of whether it is

[10] S.O.R. 2000-210.

exported by tangible or intangible means. CNSC staff submitted that they have already had meetings with exporters who were considering moving their information to a cloud-based technology, and discussed the security of the cloud service provider, how to separate sensitive information, and exactly what information was going to be moved.

88. With respect to an attempt to upload academic articles, CNSC staff submitted that, if the cloud-based server was outside of Canada, there is a possibility of not complying with regulations; however, experience shows that controlled nuclear information is often proprietary to a specific company or university, and that there is a high level of prudence in making that information publicly available in those cases. CNSC staff added that any attempt to send controlled nuclear information over electronic media out of the country also requires a licence under the NSCA and the *General Nuclear Safety and Control Regulations* (GNSCR).[11]

89. The Commission expressed its view that more clarity and enhanced guidance in the REGDOC related to this sensitive area would be helpful to prospective exporters, and would contribute to better control of intangible transfers. More clarity, targeted direct communication and a broader definition of export/import items to include sensitive scientific information would be helpful to universities and research organizations in ensuring a better understanding of their obligations with respect to this issue of "soft-transfer".

90. The Commission enquired about amendment of the section in the GNSCR that addresses the import and export of nuclear substances. CNSC staff responded that it was in the process of preparing the necessary documentation to amend section 18 of the GNSCR. Exporters are being asked to follow up with the CNSC on this issue until the amendments are made to section 18 of the GNSCR since the best way to address the issue of intangible transfer is still being considered internationally.

91. The Commission sought more information regarding the control of dual-use items. CNSC staff responded that it was aware of certain areas in the dual-use community where there might be some risks, and that CNSC staff had been proactive in reaching out to those industries in order to ensure that they are aware of the regulatory requirements in regard to their products. CNSC staff explained that the items listed in the GNSCR are in large part based on control lists that were devised by the Nuclear Suppliers Group taking into account technical specifications and properties such that a product

[11] S.O.R. 2000-202, General Nuclear Safety and Control Regulations.

could be used for a clandestine nuclear weapons program. Such products are thus identified in the *Nuclear Non-proliferation Import and Export Control Regulations* and cannot be exported from Canada without authorization from the CNSC.

92. The Commission asked about recent changes in licensing procedures introduced by Global Affairs Canada (GAC). CNSC staff responded that general export permits are issued by GAC under certain conditions, and can be used only under certain situations for specific items and for the countries that are considered an "eligible destination" under GAC's legislation (i.e., they have to be part of multilateral export control regimes).

93. The Commission enquired about end-use control and verification. CNSC staff responded that end-use control had been added to the *Nuclear Non-proliferation Import and Export Control Regulations* as part of amendments made in 2010. It allows the CNSC to make licensable an item for which there are concerns that it could be used in a non-safeguarded nuclear fuel cycle, as part of a weapons program or be diverted to that use. CNSC staff conducts a thorough assessment of end users for every export licence application, acting preventively before the export items leave Canada. The CNSC has invoked the end-use control eight times, after becoming aware of concerns with the end use. The actions included detentions made at the border with the Canada Border Services Agency stopping an item from going to a country of concern or a transit country, and referring it to government partners. The final verification of the end use is not done by Canadian authorities and is the obligation of the authorities of destination countries.

94. After considering the recommendations submitted by CNSC staff, the Commission approves regulatory document REGDOC-2.13.2, *Import and Export*, for publication and use, after modifications are made to introduce more clarity in the sections dealing with intangible and soft transfers, as suggested by the Commission. DECISION

95. The Commission noted that, in light of fast developments in cyber technologies, the publishing of this REGDOC should not prevent further improvement to it through communications with industry, international partners and future public outreach campaigns.

Closure of the Public Meeting

96. The meeting closed at 12:47 PM.

Recording Secretary — Date: NOV. 2, 2016

Recording Secretary — Date: 2016-11-02

Secretary — Date: 2016-11-02

APPENDIX A

16-M20	2016-06-08	e-Docs 5004012
Agenda of the meeting of the Canadian Nuclear Safety Commission (CNSC) to be held on Wednesday and Thursday, June 22 and 23, 2016 in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario		
16-M20.A	2016-06-16	e-Docs 5021426
Revised Agenda of the meeting of the Canadian Nuclear Safety Commission (CNSC) to be held on Wednesday and Thursday, June 22 and 23, 2016 in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario		
16-M20.B	2016-06-20	e-Docs 5026544
Revised Agenda of the meeting of the Canadian Nuclear Safety Commission (CNSC) to be held on Wednesday and Thursday, June 22 and 23, 2016 in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario		
16-M21	2016-06-19	e-Docs 5023446
Approval of Minutes of Commission Meeting held on April 6 and 7, 2016		
16-M23	2016-06-20	e-Docs 5025338
Status Report on Power Reactors		
16-M22	2016-06-15	e-Docs 5015280
Technical Briefing on Management Systems in the Nuclear Industry Submission from CNSC Staff		
16-M29	2016-06-08	e-Docs 5014169
CNSC Response to the Forest Fires in Fort McMurray Region Submission from CNSC Staff		
16-M29.A	2016-06-22	e-Docs 5022480
CNSC Response to the Forest Fires in Fort McMurray Region Presentation by CNSC Staff		
16-M24	2016-06-07	e-Docs 4997822
Status of the Designated Officer Program: 2015 Submission from CNSC Staff		
16-M24.A	2016-06-22	e-Docs 5011121
Status of the Designated Officer Program: 2015 Presentation by CNSC Staff		
16-M24.B	2016-06-07	e-Docs 5016019
Status of the Designated Officer Program: 2015 (contains classified information and is not publicly available)		

16-M26	2016-04-20	e-Docs 4983748
Event Initial Report – Cameco Corporation and L.A. Trucking - Transport accident on April 17, 2016 involving uranium concentrate near Massey, Ontario Submission from CNSC Staff		
16-M33	2016-06-06	e-Docs 5017079
Event Initial Report – Cameco Corporation – Worker injured on May 31, 2016 at Rabbit Lake Operation Submission from CNSC Staff		
16-M27	2016-05-12	e-Docs 5000535
Event Initial Report – Canadian Nuclear Laboratories Limited – Incident on April 19, 2016 at the Chalk River Laboratories during the loading of a fuel basket containing spent fuel bundles from NRX (National Research Experimental) Submission from CNSC Staff		
16-M27.A	2016-06-20	e-Docs 5026615
Event Initial Report – Canadian Nuclear Laboratories Limited - Incident on April 19, 2016 at the Chalk River Laboratories during the loading of a fuel basket containing spent fuel bundles from NRX (National Research Experimental) Supplementary Information from CNSC Staff		
16-M28	2016-05-12	e-Docs 5000537
Event Initial Report – Canadian Nuclear Laboratories Limited – Heavy water release on April 26, 2016 at the ZED-2 Research Reactor (Chalk River Laboratories) Submission from CNSC Staff		
16-M28.A	2016-06-20	e-Docs 5026616
Event Initial Report – Canadian Nuclear Laboratories Limited – Heavy water release on April 26, 2016 at the ZED-2 Research Reactor (Chalk River Laboratories) Supplementary Information from CNSC Staff		
16-M36	2016-06-09	e-Docs 5019856
Event Initial Report – Denison Mines Inc. – Fire near Denison Mines' property and Quirke Lake, on May 24, 2016 Submission from CNSC Staff		
16-M32	2016-06-20	e-Docs 5025645
Canadian Nuclear Laboratories Limited – Status Report on Fitness for Service for the Chalk River Laboratories Submission from CNSC Staff		
16-M25	2016-06-24	e-Docs 4965243
Decision Item on a Regulatory Document – REGDOC-2.13.2, Import and Export Submission from CNSC Staff		
16-M25.A	2016-06-23	e-Docs 5015627
Decision Item on a Regulatory Document – REGDOC-2.13.2, Import and Export Presentation by CNSC Staff		