Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held on November 1, 2, and 3, 2022

Minutes of the Canadian Nuclear Safety Commission (CNSC) meeting held Tuesday November 1, 2022, beginning at 10:45 a.m. EDT, Wednesday November 2, 2022, beginning at 9:00 a.m. EDT, and Thursday November 3, 2022, beginning at 9:00 a.m. EDT at the Outaouais Room, 140 Promenade du Portage, Phase IV, Gatineau, Quebec.

Present:

R. Velshi, President
T. Berube
S. Demeter
R. Kahgee
M. Lacroix
I. Maharaj
V. Remenda

D. Saumure, Registrar
L. Thiele, Senior General Counsel
D. MacDonald, Recording Secretary

CNSC staff advisors were: R. Jammal, E. Lemoine, R. Garg, A. Pilecki, R. Dwyer, J. Ramsey, K. Owen-Whitred, S. Faille, C. Pike, M. Broeders, D. Pierce, S. Khan, L. Simoneau, A. McAllister, N. Greencorn, S. Thompson, K. Murthy, L. Cundall, W. Islam, A. Levine, J. Lam, H. Tadros, N. Gadbois, A. Lemieux, N. Kwamena, A. Viktorov, L. Sigouin, K. Hazelton, L. Casterton, D. Moroz, M. Shawkat, H. Davis, R. Richardson, B. Carroll, D. Hipson, C. Purvis, Y. Guo, N. Kline and K. Cunningham

Other contributors were:

- Health Canada: M. Lamoureux
- Fisheries and Oceans Canada: S. Eddy
- Emergency Management Ontario: M. Munro
- Natural Resources Canada: P. Wai Yuen
- Atomic Energy of Canada Limited: A. MacDonald
- Canadian Nuclear Laboratories: A. Tisler, P. Quinn, P. Stirbys, M. MacKay, G. Dolinar, R. Corby and K. Rod
- Bruce Power: J. Scongack, T. Rothmaier, M. Burton and G. Newman
- Ontario Power Generation: S. Irvine, D. Rogers, C. John, A. Grace, M. Duarte, N. Zietsma and P. Fabian
- NB Power: J. Nouwens, K. Duguay and J. Lennox
- Hydro-Québec: P. Desbiens
- Executive Advisory Committee: M. Daymond

Constitution

1. With the notice of meeting Commission Member document (CMD) 22-M30 having been properly given and all permanent Commission Members being present, the meeting was declared to be properly constituted.

2. For the meeting, CMD 22-M29 to CMD 22-M34, CMD 22-M37, and CMD 22-M40 to CMD 22-M42 were distributed to Commission Members. These documents are further detailed in Appendix A of these minutes.

Adoption of the Agenda

3. The revised agenda, CMD 22-M31.A, was adopted as presented.

Chair and Registrar

4. The President chaired the meeting of the Commission, assisted by D. Saumure, Commission Registrar, and D. MacDonald, Recording Secretary.

Participant Funding Program

5. In its Notices of Participation at a Commission Meeting, the CNSC invited members of the public to intervene by way of written submission regarding the meeting items to consider three 2021 Regulatory Oversight Reports prepared by CNSC staff, and by way of written submission or written submission with accompanying oral presentation regarding the meeting item respecting elevated hydrogen equivalent concentration in pressure tubes. In the spirit of reconciliation and in recognition of the Indigenous oral tradition for sharing knowledge, Indigenous Nations and communities were invited to also make oral presentations regarding CNSC staff's Regulatory Oversight Reports. The CNSC announced the availability of funds through the Participant Funding Program (PFP) to assist in the review of these reports. A Funding Review Committee (FRC) – independent of the CNSC – reviewed funding applications and made recommendations for funding to the eligible applicants.

Minutes of the CNSC Meeting Held September 15, 2022

6. The Commission approved the minutes of the September 15, 2022, Commission meeting as presented in CMD 22-M41.

STATUS REPORT ON POWER REACTORS

7. With reference to CMD 22-M42, which includes the Status Report on Power Reactors, CNSC staff presented the following updates:

   - Bruce Power Nuclear Generating Station (NGS) Unit 5 was shut down to address an issue with the fueling system;
   - Ontario Power Generation's (OPG) Darlington NGS Unit 2 was shut down to repair a turbine intercept stop valve; and
   - Pickering Units 4, 5, 6, 7, and 8 were returning to service following a planned vacuum building maintenance outage.

8. The Commission asked for more details about the fueling system issue that occurred at Bruce Power NGS Unit 5. A Bruce Power representative responded that the issue was with the bridge that transports the fueling machine up and down. The representative stated that the root cause was likely a gearbox, which would be replaced, and that Unit 5 was expected to return to service within a day. The representative added that the issue did not impact the safety of the station and that the gearbox would be examined to identify why it failed.

9. The Commission asked about the status of the operating life of the Pickering NGS. An OPG representative noted the recent Ontario Government announcement on exploring operating Pickering NGS units 5-8 until 2026. The representative added that OPG was undertaking an analysis of its Periodic Safety Review (PSR) and had requested an extension from the CNSC on the deadline to submit its PSR and a licence application for extended operation of the Pickering NGS. CNSC staff noted that it would be submitting its recommendations on this matter to the Commission.[1]

[1] On November 24, 2022, following a hearing in writing, the Commission extended the deadline for OPG to submit its PSR and licence application from December 31, 2022, to June 30, 2023.

10. Asked about evaluating safety culture at NPPs, OPG and Bruce Power representatives provided information on recent self-assessment activities. A Bruce Power representative explained that the Bruce Power safety and security culture assessment, which had been deferred due to the COVID-19 pandemic, was completed in October 2022 and analysis is now underway. An OPG representative stated that OPG had completed its Darlington NGS safety culture assessment in 2021, and that OPG was in the process of drafting the 2022 Pickering NGS safety culture assessment results. CNSC staff confirmed that it would review safety culture assessment results and follow up as required.

11. The Commission asked CNSC staff to provide further information on the removed hold point for the production of Lutetium-177 (Lu-177) at the Bruce NGS. CNSC staff explained that hold points are a regulatory instrument where work cannot proceed beyond a defined point until regulatory reviews have been completed. CNSC staff stated that the Executive Vice-President and Chief Regulatory Operations Officer released the hold point after verifying that Bruce Power had commissioned the Lu-177 project in accordance with CNSC requirements. The removal of the hold point authorizes Bruce Power to commercially operate its Lu-177 production process.

12. Asked why it was necessary for all Pickering NGS units to be offline for vacuum building maintenance, CNSC staff explained that all units must be shut down to conduct the required tests and inspections safely. An OPG representative added that the vacuum building is required for operations, as it is connected to the containment structures of each unit, and that such maintenance is required every 12 years.

13. The Commission asked CNSC staff for a status update regarding the Potassium Iodide Pill Working Group (KIPWG). CNSC staff stated that a discussion paper to address the primary objectives of Phase II, drafted by Emergency Management Ontario (EMO) and the Ontario Ministry of Health, would be presented to the KIPWG by the end of the year. CNSC staff noted that the KIPWG's comments on this discussion paper will inform the upcoming revision of the Provincial Emergency Response Plan (PNERP). CNSC staff added that EMO anticipates launching a 60-day public review of the updated PNERP in spring 2023.

INFORMATION ITEMS

Update on Inspector Order Issued to Cameco Corporation's Cigar Lake Operation

14. CNSC staff provided an oral update on an inspector order issued to Cameco Corporation (Cameco) in respect of its Cigar Lake Operation on October 28, 2022. CNSC staff reported that, during an inspection conducted between October 17 and 21, 2022, a CNSC inspector found that the volume of waste rock stored in "Stockpile C" was greater than the volume limit defined in the licencing basis.[2] The CNSC inspector issued an order requiring Cameco to immediately stop placement of additional material on "Stockpile C". CNSC staff indicated that the order has been referred for review to a Designated Officer (DO)[3] who has informed Cameco of its right to an opportunity to be heard before deciding whether to confirm, amend, revoke, or replace the order. CNSC staff added that the order will be posted on the CNSC's public website.

15. The Commission notes that this matter remains open while it is under DO review and expressed interest in receiving further updates in the future.

Certification Process for Prescribed Equipment

16. With reference to CMD 22-M29, CNSC staff presented information on the certification process for prescribed equipment.[4] Following discussions regarding fixed nuclear gauges during the January 2021 Commission meeting, CNSC staff provided information on applicable regulations for the certification of prescribed equipment. 3 DOs in the Transport Licencing and Strategic Support Division (TLSSD) have been authorized by the Commission to certify and decertify prescribed equipment.[5] CNSC staff's presentation included a comprehensive description of the certification process for the design of prescribed equipment, including:
    - Radiation devices such as portable gauges, fixed

[2] "Stockpile C" has a volume limit of 400,000 m^3 and was found to contain roughly 415,000 m^3 of material.
[3] Designated Officers (DOs) are defined by section 37 of the *Nuclear Safety and Control Act* (NSCA).
[4] In accordance with section 20 of the *General Nuclear Safety and Control Regulations*, prescribed equipment includes transport packages, radiation devices, and Class II prescribed equipment.
[5] Subsection 37(2) of the NSCA defines the duties the Commission may authorize a DO to carry out.

nuclear gauges, and the additional requirements for exposure devices such as those used in industrial radiography;
- Class II prescribed equipment such as irradiators, medical teletherapy machines, and particle accelerators; and
- Transport packages used to ship radioactive materials.[6]

Discussion

17. The Commission asked CNSC staff to explain how the CNSC and Health Canada (HC) interact regarding the certification of Class II medical devices. CNSC staff explained that HC and CNSC processes are sequential and that the CNSC does not issue a certificate until HC has approved the medical device. CNSC staff noted that HC's approval is based on the clinical evidence from a patient treatment perspective while the CNSC is focussed on the radiological safety of the device to persons and the environment. CNSC staff added that a device must be certified before it can be added to a facility's licence for use. An HC representative provided information about HC's process and stated that it shares information with the CNSC on new applications. The representative highlighted the strong working relationship HC has with the CNSC, as evidenced by the memorandum of understanding between the two organizations.

18. Regarding approval timelines, CNSC staff detailed its service standards. CNSC staff noted that the service standards for processing an application are 12 months for a new application, 6 months for an amendment application, and 3 months for a renewal application. Asked how it considers legacy designs and the evolution of standards over time, CNSC staff explained that certificates expire and require renewal. Typically, a certificate is valid for 5 years for transport packages, 15 years for radiation devices, and 25 years for Class II prescribed equipment. CNSC staff added that it can also decertify prescribed equipment if required.

19. On the topic of transportation, the Commission asked about how international transportation requirements are updated. CNSC staff explained that it is a member of the International Atomic Energy Agency's (IAEA) Transportation Safety Standards Committee and

[6] Radioactive materials are classified as Class 7 under the *Transportation of Dangerous Goods Regulations*.

contributes to revisions to the IAEA regulations.[7] Asked about the performance of transportation packaging, CNSC staff stated that while it was not aware of any Type B[8] package failures, lower-risk industrial packages have on occasion opened and spilled. CNSC staff added that CNSC inspectors oversee the cleanup of such spills. Regarding the different package types, CNSC staff explained that test requirements are based on the risk of the material being transported and noted that in some cases a package may need to meet the requirements of more than one type.

20. CNSC staff noted that there is information on the CNSC website regarding the transportation of nuclear substances, but not the certification process in general. The Commission notes the usefulness of the visuals included in the presentation, such as for Type B package testing, and the importance of plain language information in conveying risks to the public. The Commission suggests that CNSC staff expand the information available to the public on the certification of prescribed equipment.

Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2021

21. With reference to CMD 22-M32 and CMD 22-M32.A, CNSC staff presented its 2021 regulatory oversight report (ROR) on the use of nuclear substances in Canada (the nuclear substances ROR). The 2021 nuclear substances ROR summarizes the safety performance of licensees in the medical, industrial, commercial, and academic and research sectors, as assessed by CNSC staff for the 2021 calendar year. Class IB particle accelerator facilities,[9] which are not part of the 2021 nuclear substances ROR, are included every 2 or 3 years and were last discussed in the 2019 nuclear substances ROR.

22. The 2021 nuclear substances ROR includes the following information:

- an overview of inspections conducted by CNSC staff;

[7] SSR-6 – *Regulations for the Safe Transport of Radioactive Material*
[8] Type B, Type C, and Type H packages are used to transport high-risk levels of radioactive material and require certification by the CNSC.
[9] These Class IB facilities are the Tri University Meson Facility (TRIUMF) and the Canadian Light Source Inc. (CLSI).

- CNSC staff's assessment of licensee compliance and performance, focussing on the safety and control areas (SCAs) that are the most relevant indicators of licensee safety performance;[10]
- enforcement actions taken by CNSC staff, including orders and administrative monetary penalties (AMPs);
- radiation doses to workers and licensee performance in keeping doses as low as reasonably achievable (ALARA);
- events reported to the CNSC by licensees; and
- CNSC staff's outreach and public engagement activities.

23. In addition, CNSC staff presented the following information:
    - a summary of the changes made to the 2021 ROR in response to past input and feedback; and
    - the key themes of interventions submitted for the 2021 nuclear substances ROR, including the scope of the ROR, environmental protection, and inspections.

24. CNSC staff further reported that while the COVID-19 pandemic continued to impact the CNSC's compliance verification activities in 2021, there has been a gradual return to in-person inspections. CNSC staff stated that the use of nuclear substances in Canada continues to be managed appropriately, and that licensees made acceptable provisions to protect health, safety, security, and the environment from the use of nuclear substances and prescribed equipment in 2021.

Interventions

25. With respect to the CNSC's PFP availability for the 2021 nuclear substances ROR, the FRC recommended that up to $10,000 in participant funding be provided to the Canadian Environmental Law Association (CELA) and the Nuclear Transparency Project.

26. The Canadian Radiation Protection Association (CRPA) (CMD 22-M32.1), CELA (CMD 22-M32.2), and the Nuclear Transparency Project (CMD 22-M32.3) provided written interventions regarding the 2021 nuclear substances ROR.

[10] The SCAs of focus are management system, operating performance, radiation protection, and security

27. Asked about its relationship with the CRPA, CNSC staff stated that the CRPA is a valuable source of industry information. CNSC staff explained that it typically meets with the CRPA twice per year to discuss various subjects, including events and specific topics of interest such as transportation. CNSC staff added that it uses these meetings to keep the CRPA informed of relevant CNSC initiatives.

28. With reference to CELA's intervention, the Commission asked CNSC staff to explain how compliance issues in SCAs that are not highlighted in the ROR were reported on. CNSC staff explained that the highlighted SCAs are chosen because they are the most relevant and issues in other SCAs are less common. CNSC staff confirmed that any unacceptable rating, enforcement action, or event would be included in the annual ROR regardless of the associated SCA.

29. Noting the recommendations made in interventions, CNSC staff explained its process for dispositioning such comments. CNSC staff does not have a documented process for addressing each comment but considers and incorporates feedback into future RORs. CNSC staff reported that it met with CELA following the 2020 nuclear substance ROR and plans to offer a similar meeting to the Nuclear Transparency Project to discuss its intervention.

Discussion

30. In response to questions about compliance performance ratings, CNSC staff clarified the meaning of the reported satisfactory rating percentage. CNSC staff explained that a rating of below expectations is not an immediate concern, while a rating of unacceptable is something that is considered unsafe, is a repeat issue, or is an issue at a wider program level.

31. The Commission asked for more information on reportable events, such as lost sources. CNSC staff explained its expectations regarding lost or stolen sources and noted that reports are posted on the CNSC website. With respect to the transportation sector, CNSC staff stated that the low threshold for reporting events indicated a strong safety culture. CNSC staff added that the quantity of events is due to the large number of shipments. Regarding specific events noted in the 2021 nuclear substances ROR, CNSC staff provided more

information on the unexpected activation of a linear accelerator and about a fixed gauge event that resulted in the issuance of an AMP. Information about AMPs and other regulatory actions is posted on the CNSC's public website.

32. Asked about inspections, CNSC staff explained that, going forward, most inspections will be in-person but that hybrid inspections will be employed to improve efficiency where remote verification is appropriate, such as for interviews or document reviews. CNSC staff also highlighted its current recruitment activities intended to hire, train, and retain inspectors. Regarding the impact of inspections on licensee performance, CNSC staff noted a strong correlation between reduced in-person inspections and a decline in licensee performance in the security SCA. CNSC staff explained that certain security inspection elements could only be performed in-person.

33. The Commission noted its concern regarding performance in the medical sector that is consistently below expectations and asked how CNSC staff's regulatory oversight could improve this sector's performance. CNSC staff stated that there is not an immediate risk to health and safety and that it would investigate how it communicates licensee performance. Regarding improvements, CNSC staff highlighted targeted engagement with licensees to bring awareness to issues and that the medical sector will continue to be a focus of inspection for 2022. Asked about the qualification of radiation safety officers (RSO), CNSC staff explained that RSO certification does not currently expire but that CNSC staff was considering proposing an amendment to the regulations[11] to require a demonstration of ongoing competency, which RSOs have been supportive of.

34. The Commission asked for more information concerning the ongoing situation with Mississauga Metals and Alloys.[12] CNSC staff provided the Commission with a summary of the challenges faced to date in dispositioning the materials stored at the site. CNSC staff explained that it is moving through a procurement process aligned with government requirements for a third-party expert to undertake site characterization. CNSC staff indicated that it is also working through issues with the trustee in

[11] SOR/2000-205 - *Class II Nuclear Facilities and Prescribed Equipment Regulations*
[12] The bankruptcy of Mississauga Metals and Alloys was brought to the attention of the Commission at the October 2021 Commission meeting.

bankruptcy with a view to executing the work. Regarding the security of the site, CNSC staff confirmed that a 24-hour security presence would remain in place until all materials have been removed from the site. CNSC staff reported that it expects final waste disposition to occur in 2024.

35. The Commission noted the quality of the 2021 nuclear substances ROR and appreciates CNSC staff's responses to Commission Members' questions. The Commission found that the 2021 nuclear substances ROR was clearly written, thorough, and data-rich, and that the use of hyperlinks throughout the ROR was helpful.

Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021

36. With reference to CMD 22-M33 and CMD 22-M33.A, CNSC staff presented its 2021 ROR for the Canadian Nuclear Laboratories (CNL) sites (the CNL ROR). The CNL ROR summarizes CNL's safety performance at the following sites:

- Chalk River Laboratories (CRL);
- Whiteshell Laboratories (WL); and
- CNL's 3 prototype power reactor waste facilities – the Douglas Point waste facility, the Gentilly-1 waste facility, and the Nuclear Power Demonstration (NPD) waste facility.

CNSC staff noted that the Port Hope Area Initiative (PHAI), which includes the Port Hope Project and the Port Granby Project, was not included in the 2021 CNL ROR. CNSC staff explained that information on the performance of the PHAI would be included in an upcoming licence renewal hearing later in November 2022. The Commission noted that the ROR is a standalone document that may be referenced and compared across multiple years, which is separate from the hearing process. The Commission expects that the CNL ROR include information on all relevant sites regardless of the timing of related hearings.

37. The CNL ROR includes information on the following:

- an overview of the covered CNL sites;
- CNSC staff's regulatory oversight activities;
- CNSC staff's assessments across each of the 14 SCAs, with a focus on the radiation protection,

conventional health and safety, and environmental protection SCAs;
- stakeholder engagement activities performed by CNL and CNSC staff;
- reportable events and other matters of interest, including the COVID-19 pandemic response.

38. In addition, CNSC staff's presentation provided:

- key themes from the interventions regarding the CNL ROR, including consultation and engagement with Indigenous Nations and communities, and the scope of the CNL ROR; and
- errata in the CNL ROR, including correcting the Whiteshell Laboratories 2020 security SCA performance rating from satisfactory to below expectations, the CRL estimated dose to the public, and the maximum effective dose received by a CNL nuclear energy worker.

39. CNSC staff informed the Commission that all CNL sites operated safely in 2021. CNSC staff found that CNL kept doses ALARA; protected workers from conventional health and safety hazards; and, in conducting its licensed activities, effectively protected people and the environment.

40. A CNL representative provided oral remarks highlighting CNL's activities in the 2021 calendar year, including decommissioning and restoration activities, construction of new facilities, and small modular reactor development. The representative noted CNL's commitment to safety and continuous improvement and acknowledged CNL's performance issues with respect to the security SCA.

41. Following the public portion of the meeting on November 2, 2022, the Commission convened for a closed session to discuss details related to CNL's performance in the security SCA (CMD 22-M33.B). This portion of the Commission meeting was not open to the public and was held *in camera* because it related to "prescribed information" as defined in the *General Nuclear Safety and Control Regulations*, in respect of which there are regulatory requirements and restrictions on disclosure. Regarding the information available in the CNL ROR, the Commission noted the importance of clearly communicating to the public essential information about the level of risk associated with situations involving confidential information. With respect to the

security SCA, it is to be noted that the Commission is satisfied with CNL's progress in addressing the issues and therefore sees no current security risk that requires its action. Rather, the Commission expects CNSC staff to keep it informed of the ongoing status of these issues.

Interventions

42. With respect to the CNSC's PFP availability for the 2021 CNL ROR, the FRC recommended that up to $107,190 in participant funding be provided to:

- Sagkeeng First Nation;
- Canadian Environmental Law Association;
- Algonquins of Pikwakanagan First Nation;
- Chippewas of Kettle and Stony Point First Nation;
- Manitoba Métis Federation;
- Grand Council Treaty #3;
- Curve Lake First Nation; and
- Nuclear Transparency Project.

43. The Commission received written interventions regarding the CNL ROR from Evelyn Gigantes (CMD 22-M33.1), the Canadian Nuclear Association (CMD 22-M33.2), the Canadian Environmental Law Association (CMD 22-M33.3), Sagkeeng Anicinabe First Nation (CMD 22-M33.5), Curve Lake First Nation (CMD 22-M33.7), Chippewas of Kettle and Stony Point First Nation (CMD 22-M33.8), and the Nuclear Transparency Project (CMD 22-M33.9).

44. The Manitoba Métis Federation (MMF) provided the Commission with an oral presentation and written submission (CMD 22-M33.4 and CMD 22-M33.4A) that focused on CNL's Whiteshell Laboratories. The MMF expressed concerns regarding CNL's security performance, the CNSC's independent environmental monitoring program (IEMP), and demonstrating resolution of comments and recommendations.

45. The Algonquins of Pikwakanagan First Nation (AOPFN) provided the Commission with an oral presentation and written submission (CMD 22-M33.6 and CMD 22-M33.6A) that focused on CNL's CRL and NPD. The AOPFN reviewed the CNL ROR and made recommendations regarding information sharing, health and safety from an Indigenous perspective, and consultation and engagement. The AOPFN also included information on how the CNSC's SCAs could expand

beyond the western scientific perspective to promote the recognition and protection of Aboriginal rights.

46. The Grand Council Treaty #3 provided the Commission with an oral presentation and written submission (CMD 22-M33.10 and CMD 22-M33.10A) considering the CNL ROR. The Grand Council Treaty #3 provided feedback and recommendations, including the inclusion of Indigenous knowledge (IK), addressing previous recommendations, and consideration of cumulative effects. The Grand Council Treaty #3 also discussed the Manito Aki Inakonigaawin, which is the Great Earth Law, and the Nibi declaration, which is a way for the Grand Council Treaty #3 to explain the Anishinaabe relationship to water.

47. Asked what is being done to address issues pertaining to the historical operations of CNL's sites, CNSC staff noted its trend towards more openness over the past ten years. CNSC staff highlighted the work to establish terms of reference (TOR) with interested Indigenous Nations and communities, including the AOPFN and MMF, which will enable further collaboration on the ROR. A CNL representative detailed CNL's reconciliation action plan. The representative stated that CNL's goal is to build meaningful relationships with Indigenous Nations and Communities and remove barriers for employment.

48. The Commission noted the concerns raised by several interventions that past comments on RORs have not been addressed and asked if there was a formal mechanism to provide answers to intervenor questions. CNSC staff stated that it meets with interested Indigenous Nations and communities regularly to address questions and has a process for providing feedback on their interventions. A CNL representative stated that CNL had recently met with the MMF to discuss the MMF's recommendations. An MMF representative acknowledged that lists of recommendations compiled by CNSC staff and CNL are helpful but stressed that there is no current mechanism to require that CNL address the MMF's concerns.

49. On the topic of monitoring, an MMF representative explained the importance of impartial reporting on all monitoring activities, including those conducted by Indigenous Nations and communities. An AOPFN representative noted that the AOPFN is working with CNL in developing an independent guardian program. Asked about intervenor concerns regarding discharges to

the environment from Whiteshell Laboratories, a CNL representative explained that yearly variations in the effluent monitoring results are due to the difficulty of measuring at such low levels near instrument detection limits. Regarding IEMP sample collection, CNSC staff clarified that it ensures any foodstuffs purchased at a store are locally-sourced and also provides collection kits to local hunters and gatherers.

50. The Commission asked about concerns raised regarding the transport of nuclear wastes. An AOPFN representative explained that the AOPFN had not been notified of such transport in the past and that it wanted to be informed of, and consent to, such activities. The AOPFN noted that is has concerns about nuclear waste being brought into its territory. CNSC staff discussed the CNSC's requirements for CNL to maintain a public disclosure program. A CNL representative provided information on CNL's transport program and stated that it has engaged the AOPFN on this issue, and that it was open to continuing those discussions.

51. With respect to IK, the Commission asked for examples where traditional knowledge has been successfully integrated. An AOPFN representative informed the Commission that this is a work in progress and highlighted inclusion in the IEMP, four seasons monitoring activities, and the bringing of Indigenous Knowledge Keepers to licensed sites. CNSC staff stated that it informs Indigenous Nations and communities of upcoming IEMP campaigns and how they can contribute.

52. Regarding the broader integration of IK into programs, a CNL representative provided details on CNL's work to incorporate IK into its activities. CNSC staff stated that it is looking into how IK studies could be applied within each SCA and highlighted cultural learning experiences, including with the Grand Council Treaty #3, attended by CNSC staff. CNSC staff noted the next step of conveying what it has heard in a language that is meaningful to Indigenous Nations and communities.

53. The Commission appreciated hearing the perspective of Indigenous Nations and communities with respect the CNL ROR. The Commission noted the importance of considering Indigenous engagement as an ongoing program rather than focusing on individual projects. The Commission understands the importance of listening to the concerns of Indigenous Nations and communities, but

also noted the importance of meaningful actions to address comments.

Discussion

54. Regarding the CNL ROR document itself, the Commission asked about the included dashboard.[13] CNSC staff stated that the dashboard is produced as a companion to the ROR. Asked about its description of reportable events, CNSC staff stated that it uses the titles provided in event reports but acknowledged that this may not convey a clear enough message to the public. CNSC staff added that further event details are posted on CNL's website quarterly. The Commission noted that providing additional context on events in the CNL ROR would be useful.

55. Asked about action levels, CNSC staff explained their purpose in detecting an issue before a larger problem occurs. CNSC staff confirmed that action levels are based on licensee data and are facility specific. Regarding how it will address a particular action level exceedance at CRL, a CNL representative explained that the incident was not a single event but a chronic exposure. The representative noted that CNL was aware that the employee was trending towards a small exceedance well in advance, but interventions would have introduced additional risk and there was an unavailability of other qualified workers. CNSC staff added that it was satisfied with CNL's response to this incident.

56. The Commission asked for clarification on why the maximum annual and maximum 5-year effective dose values reported at CRL are identical. CNSC staff explained that, for the purpose of the regulatory dose limit,[14] the 5-year dosimetry period is a fixed 5-year period and that a new period began in 2021. Therefore, the reported maximum effective dose for the 5-year dosimetry period contains only data from 2021. The Commission noted that this is not clearly communicated in the CNL ROR and expects CNSC staff to provide additional clarification for this in subsequent RORs.

[13] The dashboard, included in appendix B of the CNL ROR, is a graphical tool to quickly communicate key information about the performance of CNL's sites.
[14] The effective dose limit for the 5-year dosimetry period is 100 millisieverts (mSv), as per section 13 of the *Radiation Protection Regulations*.

57. The Commission inquired about the status of the proposed in-situ decommissioning project at Whiteshell Laboratories. CNSC staff responded that review of CNL's environmental impact statement (EIS) is currently ongoing. A CNL representative expressed that CNL anticipated submission of an updated EIS to the CNSC within one month to address CNSC comments.

58. The Commission asked about the impact of the COVID-19 pandemic on CNL operations in 2021. A CNL representative noted that while operations have returned to normal, there was an impact to decommissioning activities and delays in project schedules. Another CNL representative added that CNL continues to have pandemic plans in place.

59. The Commission appreciated the information provided by CNSC staff, CNL staff, and intervenors in response to Commission Members' questions.

Regulatory Oversight Report for Canadian Nuclear Generating Stations: 2021

60. With reference to CMD 22-M34, CMD 22-M34.A, and CMD 22-M34.C, CNSC staff presented its 2021 ROR for Canadian Nuclear Power Generating Stations (the NPGS ROR). The NPGS ROR summarizes the safety performance of the following nuclear power plants (NPPs) and waste management facilities (WMFs):

- Ontario Power Generation's (OPG) Darlington Nuclear Generating Station (NGS) and Darlington WMF;
- OPG's Pickering NGS and Pickering WMF;
- Bruce Power's Bruce A NGS and Bruce B NGS;
- OPG's Western WMF and Radioactive Operations Site-1 (RWOS-1) at the Bruce site;
- New Brunswick (NB) Power's Point Lepreau NGS and the included Solid Radioactive Waste Management Facility (SRWMF); and
- Hydro Quebec's Gentilly-2 facilities.

61. The NPGS ROR includes the following:

- background information on the nuclear facilities covered in the report;
- a general overview of performance across all 14 SCAs; and
- facility specific information on regulatory

developments and performance across all 14 SCAs.

62. In addition, CNSC staff's presentation and supplemental submission provided:

- a summary of the issues raised through interventions related to the NPGS ROR, including the safe operating envelope, collective dose to workers, Indigenous engagement and consultation, and availability of data;
- CNSC staff responses to specific interventions;
- follow-up on Commission information requests and associated action closure recommendations; and
- errata in the NPGS ROR, including clarification of the fisheries act authorisation discussion and corrections to the integrated implementation plan (IIP) status statistics.

63. CNSC staff informed the Commission that NPPs and WMFs operated safely in 2021. CNSC staff found that no serious process failures occurred at the NPPs, radiation doses and releases to the environment remained below regulatory limits, and conventional injuries were kept low.

64. Representatives of the licensees covered by the NPGS ROR provided oral updates to the Commission. The representatives highlighted recent and upcoming activities, improvements, and their commitment to safety.

65. The Commission found the NPGS ROR to be a well-written report. Regarding open actions from previous public meetings of the Commission, the Commission accepts CNSC staff's recommended action closures as noted in CMD 22-M34.C.

66. Following the public portion of the meeting on November 2, 2022, the Commission convened for a closed session to discuss confidential details related to OPG's performance in the security SCA (CMD 22-M34.B). The Commission notes the important role of performance ratings in conveying information to the public. The Commission is of the opinion that in cases where details must remain confidential, it is nevertheless essential for CNSC staff to clearly communicate to the public necessary information respecting the risks associated with a lower rating. After the *in camera* portion of the meeting to address these issues, the Commission notes that it is satisfied with OPG's actions

to date in addressing the issues related to the security SCA. The Commission expects CNSC staff to keep it informed of the ongoing status of these issues.

Interventions

67. With respect to the CNSC's PFP availability for the 2021 NPGS ROR, the FRC recommended that up to $68,740.75 in participant funding be provided to:

- Grand Conseil de la Nation Waban-Aki
- Dr. Helmy Ragheb
- Canadian Environmental Law Association
- Curve Lake First Nation
- Nuclear Transparency Project
- Passamaquoddy Recognition Group Inc.
- Wolastoqey Nation in New Brunswick
- The Chippewas of Kettle and Stony Point First Nation

68. The Commission received the following written interventions regarding the NPGS ROR:

- Dr. Helmy Ragheb (CMD 22-M34.2);
- le Grand Conseil de la Nation Waban-Aki (CMD 22-M34.3);
- Curve Lake First Nation (CMD 22-M34.4);
- the Nuclear Transparency Project (CMD 22-M34.5);
- the Canadian Environmental Law Association (CMD 22-M34.6);
- the Grey Bruce Health Unit (CMD 22-M34.7);
- the Municipality of Kincardine (CMD 22-M34.8);
- the Town of Saugeen Shores (CMD 22-M34.9);
- Gordon W. Dalzell (CMD 22-M34.10);
- the Saugeen Ojibway Nation (CMD 22-M34.11);
- the Canadian Nuclear Association (CMD 22-M34.12);
- the Wolastoqey Nation in New Brunswick (CMD 22-M34.13); and
- Chippewas of Kettle and Stony Point First Nation (CMD 22-M34.14).

69. The Passamaquoddy Recognition Group Inc. (PRGI) provided the Commission with an oral presentation and written intervention (CMD 22-M34.1) focused on the Point Lepreau NGS. The PRGI discussed its concerns, including possible future development of a small modular reactor (SMR), its view of the inadequacy of land acknowledgements, and various technical matters.

The PRGI also included specific recommendations for the NPGS ROR.

70. Regarding concerns raised by the PRGI related to radiological risks of the Point Lepreau NGS, the Commission asked for more information concerning the estimated source term.[15] CNSC staff stated that the postulated source term is conservative and based on modeling for extremely unlikely events. CNSC staff added that the IAEA source term referred to in the PRGI's intervention is based on light water reactor technology, not the CANDU reactor technology used at the Point Lepreau NGS. Asked about ongoing work to reduce the levels of tritium in the Point Lepreau NGS moderator system, an NB Power representative detailed recent progress and stated that the project is estimated for completion in 2028.

71. Asked about concerns raised regarding staffing levels, licensee representatives detailed their hiring practices and impacts on staffing due to the COVID-19 pandemic. Regarding the ratio of hired staff to the minimum shift complement, an NB Power representative noted that NB Power maintains staffing defence-in-depth but does have a lower ratio compared to other NGS sites because the Point Lepreau NGS is a single unit station. The NB Power representative also highlighted recent improvements to the staffing of NB Power's emergency response team.

72. On the topic of monitoring, the Commission asked how it engages Indigenous Nations and communities in its IEMP. CNSC staff detailed notification letters, meeting with communities to collect feedback on sampling plans, and recent participation in sampling campaigns. Regarding the availability of data, CNSC staff explained that IEMP results are posted online. CNSC staff added that the National Pollutant Release Inventory (NPRI) now includes links to the CNSC's facility-specific webpages and to the CNSC's open government portal containing radionuclide release datasets. CNSC staff stated that it is investigating its open government strategy and plans to provide an update to the Commission in 2023 in response to an action from a previous Commission meeting.[16] The Commission acknowledged CNSC staff's recent progress with respect to greater

[15] A source term is the amount and isotopic composition of material released (or postulated to be released) from a nuclear facility.
[16] Minutes of the Commission Meeting held on April 27, 2021.

transparency and the accessibility of information.

73. An OPG representative detailed OPG's *Reconciliation Action Plan*, noting that the plan is under continuous development and involves tangible targets. An NB Power representative stated that NB Power is committed to developing plans together with Indigenous Nations. Asked if it was willing to work with NB Power, a PRGI representative stated that the PRGI would continue to meet with NB Power. The PRGI representative added that while there have been improvements to the process, the PRGI do not want an SMR in their homeland.

74. On the topic of ongoing engagement with Indigenous Nations and communities, CNSC staff expressed that it maintains an open-door policy in sharing any desired information. CNSC staff detailed its recent engagement activities with the PRGI, including a discussion on SMRs, and noted that its engagement activities are not tied to a licence term. CNSC staff added that it is working to formalize engagement with interested communities. The Commission noted the helpful recommendations included in the PRGI intervention.

Discussion

75. The Commission asked about CNSC staff's oversight of the Pickering NGS in light of the planned end of commercial operations. CNSC staff explained that the planned end of commercial operations has not impacted the CNSC's oversight. Regarding a CNSC inspection finding about a condemned building on the Pickering NGS site, an OPG representative clarified that, following the CNSC inspection, access to the building was further restricted and noted that it has since been demolished.

76. Asked about the year-over-year increase in collective dose at the NPPs, CNSC staff discussed the purpose of collective dose in monitoring licensee work planning and performance. CNSC staff explained that the scope of radiological work is not consistent year-over-year and noted that the increases are predominately due to high-dose refurbishment work. CNSC staff acknowledged that this could have been better explained in the NPGS ROR and added that it is confident licensee's maintain robust radiation safety programs. Licensee representatives also provided information on their respective radiation protection programs and work to keep doses ALARA.

77. Regarding the issues related to safety analysis that are noted in the NPGS ROR, CNSC staff explained the industry's "composite analytical approach" to addressing issues. CNSC staff noted that such work aims to apply a more realistic analysis in the evaluation of the consequences of certain postulated pipe breaks. CNSC staff confirmed that, while the design of the NPPs has not changed, this work builds on new knowledge.

78. On the topic of waste management, CNSC staff provided information on the Nuclear Waste Management Organization's (NWMO) upcoming integrated waste management strategy. CNSC staff also detailed CNSC requirements for licensee decommissioning plans, including long-term waste management strategies. Asked about low- and intermediate-level waste, licensee representatives detailed their respective plans for the long-term management of such waste, including financial guarantees, volume reduction, and industry cooperation. An OPG representative clarified that OPG is planning to co-locate intermediate-level waste with high-level waste. Asked about a plan in the event that the ongoing NWMO siting process is unsuccessful, an OPG representative explained that OPG would continue to safely store waste at its existing facilities, and leverage best practices established by the NWMO in seeking community support for a permanent disposal facility.

79. The Commission asked CNSC staff to articulate the meaning of the IIP action completion percentage reported in the NPGS ROR. CNSC staff expressed that the scope and timeline of actions in the IIPs vary, noting that programmatic changes that do not involve equipment can be completed quicker. A Bruce Power representative explained that many IIP actions are tied to refurbishment projects and will only be closed when the refurbishment project is complete.

80. Asked about engagement related to the Pickering NGS *Fisheries Act*[17] authorization, a representative from Fisheries and Oceans Canada provided information on recent engagement and consultation on amendments to the authorization. The representative noted that the amended authorization was issued in 2022 and that the offsets remain in place. The representative added that engagement with Indigenous Nations and communities continues regularly.

[17] R.S.C., 1985, c. F-14

81. Regarding Ontario's *Provincial Nuclear Emergency Response Plan* (PNERP), the Commission enquired about the status of the Unified Transport Management Plan (UTMP). A representative of Emergency Management Ontario (EMO) stated that a draft of the updated PNERP would be available for public consultation in the spring of 2023. The EMO representative noted that the UTMP is being drafted by Ontario's Ministry of Transportation and will be incorporated into the revised PNERP. The EMO representative added that EMO is aiming to complete the revised PNERP in December 2023.

82. The Commission appreciated the information provided in answers to Commission Members' questions and the availability of CNSC staff, licensees, and intervenors for the NPGS ROR.

Update on the Discovery of Elevated Hydrogen Equivalent Concentrations in the Pressure Tubes of Reactors in Extended Operation

83. With reference to CMD 22-M37 and CMD 22-M37.A, CNSC staff provided an update on the discovery of elevated hydrogen equivalent concentration ([Heq]) in CANDU fuel channel pressure tubes. This is a follow-up to information presented at the September 3, 2021, and March 24, 2022, Commission meetings.

84. CNSC staff provided the Commission with information on the ongoing work performed by CNSC staff and licensees to address the issues of elevated [Heq] at the inlet and outlet burnish mark locations of fuel channel pressure tubes. CNSC staff included its assessment of licensee research and development plans, its assessment of licensee submissions, and information about its risk-informed decision-making assessment. CNSC staff reported that the industry is working to develop an interim [Heq] model by the end of 2023 and a validated comprehensive model by the middle of 2026. CNSC staff reported its assessment that the increase in risk is negligible for continued operation in the short term (2-3 years) and noted that alternate fitness for service compliance verification criteria are in place.

85. The Commission also received written submissions from OPG (CMD 22-M37.1), NB Power (CMD 22-M37.2),

and Bruce Power (CMD 22-M37.3). These submissions detail the work performed and planned by licensees to address the discovery of elevated [Heq], including to update predictive models, confirm the effect of thermal gradients on [Heq] evolution, and demonstrate fitness for service. The Commission notes that elevated [Heq] is not a concern at the Point Lepreau NGS since its pressure tubes have not been in service long enough.

86. The External Advisory Committee on Pressure Tubes (the EAC) was present at this meeting to provide technical input to the Commission. The EAC provided questions for CNSC staff and licensees by way of CMD 22-M37.8. The Commission directed CNSC staff, OPG, and Bruce Power to file written responses to the EAC's questions with the Commission Registry by December 9, 2022. Further, the Commission instructed the EAC to produce a report on its findings related to the elevated [Heq] matter.

Action
by June 2023

Interventions

87. With respect to the CNSC's PFP availability for the update on elevated [Heq], the FRC recommended that up to $37,460 in participant funding be provided to:

- Dr. Frank Greening
- Paul Sedran
- Canadian Association of Nuclear Host Communities

88. The Commission received written interventions regarding the discovery of elevated [Heq] from Dr. Frank Greening (CMD 22-M37.4), the Canadian Nuclear Association (CMD 22-M37.6), and the Canadian Association of Nuclear Host Communities (CMD 22-M37.7).

89. Dr. Greening's submission included an assessment of available data. Dr. Greening is of the opinion that redistribution of hydrogen due to temperature gradients is insufficient to explain the observed elevated [Heq] and noted inconsistencies in the ratio of hydrogen to deuterium.[18] Dr. Greening highlighted the importance of understanding the root cause of the elevated [Heq] and proposed a hypothesis involving ingress of hydrogen from the annulus gas system (AGS). Dr Greening also provided recommendations, including about the

[18] Deuterium is an isotope of hydrogen containing one proton and one neutron. For the purposes of these minutes, hydrogen refers to the isotope containing one proton and zero neutrons.

unreliability of in-situ scrape sampling, investigating the possible role of the AGS as a source of hydrogen, and the hydrogen pickup rate.

90. Paul Sedran provided the Commission with an oral presentation and written intervention (CMD 22-M37.5 and CMD 22-M37.5A). Mr. Sedran discussed the licensees' thermal diffusion hypothesis and noted that it may not be sufficient to explain the elevated [Heq] observations. Mr. Sedran detailed a possible additional hypothesis of hydrogen uptake involving electrochemical diffusion from the end fitting into the pressure tube through the rolled joint that connects them. Mr. Sedran added his view that, regardless of the hypothesised cause, the risk to overall safety would be similar.

91. Regarding the alternative hypotheses raised by intervenors, CNSC staff expressed that it appreciated the analysis provided by Dr. Greening and Mr. Sedran. CNSC staff explained that while it found the causes proposed by licensees to be plausible, other possibilities also need to be considered. CNSC staff noted that it expects licensees to address issues raised by intervenors through the industry research and development program. A Bruce Power representative noted that it does evaluate various explanations and ensures they are understood.

92. Asked to comment on Mr. Sedran's simplified assessment about how different diffusion mechanisms could work together, a Bruce Power representative explained that Bruce Power's assessment uses a sophisticated technique that accounts for changes in forms of hydrogen, such as the formation of solid hydrides, during thermal cycling. The Bruce Power representative added that the temperature gradient from top to bottom of the pressure tube is 20-25 degrees Celsius. A member of the EAC agreed that hydrogen in hydride form must be accounted for and that this would result in a smaller temperature gradient being required to explain the elevated [Heq] than identified by Mr. Sedran's simplified assessment.

93. Regarding the unexplained excess ratio of hydrogen to deuterium noted throughout Dr. Greening's intervention, an EAC member highlighted the importance of further investigating this discrepancy. CNSC staff stated that this discrepancy had been observed previously but that the reason it exists is currently unknown. Representatives from Bruce Power and OPG confirmed that the industry

was looking into this discrepancy through its research and development programs. A Bruce Power representative added that hydrogen and deuterium are expected to behave in a similar manner.

94. The Commission appreciates the information provided by intervenors for the elevated [Heq] matter. The Commission found the detailed technical information provided by Dr. Greening and Mr. Sedran to be a useful addition to the discussion of this matter. The Commission acknowledges the efforts by CNSC staff and licensees to provide requested information to intervenors.

Discussion

95. The Commission asked how the licensees' various models and tools to evaluate fitness for service work together. A Bruce Power representative provided details about how the testing of material properties feeds into various models, such as material performance models and models that predict the movement of hydrogen in the pressure tube material. The Bruce Power representative noted that logic diagrams outlining the steps in the assessment process can be found in the applicable standard.[19] Asked about the accounting for uncertainty in these models, the Bruce Power representative explained that a determination of uncertainty is included in the process. CNSC staff confirmed that the current models continue to be valid for regions between the inlet and outlet areas of interest.

96. Asked about the impact of elevated [Heq] on defence in depth, CNSC staff provided details about the operation of CANDU fuel channels. CNSC staff stated that the risk of crack initiation at the outlet end is low, as there is no mechanism for flaw formation in the vicinity of the outlet end elevated [Heq]. At the inlet end, CNSC staff expressed that it was unable to assess fitness for service of the pressure tubes[20] but that other defence in depth barriers exist. CNSC staff informed the Commission that a crack remains very unlikely and noted that a pressure tube failure is accommodated for in the CANDU design. CNSC staff added that it continues to work on its assessment, including whether the outer diameter nature of the inlet end elevated [Heq] would limit interactions

[19] CSA N285.8, *Technical requirements for in-service evaluation of zirconium alloy pressure tubes in CANDU reactors*
[20] For the Pickering NGS, the same approach used for the outlet end also applies to the inlet end.

with possible flaws.

97. Regarding fuel channel design, a Bruce Power representative described the various components, including stainless-steel end fittings, zirconium-niobium alloy pressure tubes, and spacers. On the topic of leak detection, CNSC staff informed the Commission that there have been no reported issues with the AGS. CNSC staff explained that since leak before break[21] cannot be proven without updated models for the inlet end elevated [Heq], the AGS can not be relied upon to detect a failing pressure tube in these situations.

98. The Commission asked how the proposed model development timeline relates to CNSC staff's assessment that risks will remain negligible for 2 to 3 years. CNSC staff clarified that the risk assessment time period and research and development timelines are independent of each other. CNSC staff stated that it continuously reviews its assessment of risks as new information becomes available.

99. Noting the complexity of this matter, the Commission asked for information on communications with the public and Indigenous Nations and communities. A Bruce Power representative described Bruce Power's communications on this topic and noted that it spends the time required to explain the matter to those interested. CNSC staff highlighted various communications mechanisms, including information on pressure tubes published on the CNSC website. The Commission notes that the inclusion of more figures, such as block diagrams, would improve the ability of non experts to understand this complicated process.

100. The Commission appreciates the comprehensive answers to Commission Members' questions provided by CNSC staff and licensees regarding the elevated [Heq] matter. In addition to the responses to questions from the EAC and the expected report from the EAC, the Commission expects CNSC staff to provide a similarly comprehensive update on the progress to address elevated [Heq] at a future public meeting of the Commission. CNSC staff shall present this update before the next NPGS ROR.

Action
by
October 2023

[21] A leak from a flaw detected early enough for the reactor to be shut down and depressurized before the flaw grows large enough to cause a rupture.

Update on Canada's Participation at the 7th Review Meeting of the *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*

101. With reference to CMD 22-M40, CNSC staff provided information on Canada's participation at the 7th review meeting of the *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management* (Joint Convention). CNSC staff included background on the Joint Convention and detailed Canada's participation at the 7th review meeting, which was held from June 27 to July 8, 2022. CNSC staff noted that the 7th review meeting had been delayed due to the ongoing COVID-19 pandemic.

102. CNSC staff reported that Canada's delegation at the 7th review meeting included representatives from government and industry. CNSC staff expressed that the Joint Convention Review Meeting is a valuable peer review process, fosters an international approach, and provides and opportunity to share expertise. CNSC staff informed the Commission that Canada has demonstrated its commitment to the Joint Convention's objectives and compliance with the obligations of the Joint Convention. The 8th review meeting is scheduled for 2025.

Discussion

103. The Commission asked about the scope of the Joint Convention. CNSC staff stated that the Joint Convention is a treaty by incentive, which Canada is obligated to meet. CNSC staff noted that non-proliferation is not within the scope of the Joint Convention as it is focused on nuclear safety. CNSC staff detailed the political challenges engaged at this Review Meeting in reaching a consensus, such as the recent invasion of Ukraine by Russia. Regarding international standards, CNSC staff detailed the process for revising such standards and highlighted that the CNSC has a representative on the Waste Safety Standards Committee. CNSC staff added that the CNSC's regulatory framework is technology-neutral and under continuous improvement, including through the consideration of updated international and Canadian standards.

104. The Commission asked about the good practices of other States Parties to the Joint Convention who attended the 7th review meeting. CNSC staff highlighted Finland's stepwise licensing process for spent fuel disposal,

France's socioeconomic study of a deep geological repository, and Sweden's licensing of a spent fuel disposal system. Regarding the peer review process, CNSC staff explained that a recommendation made by Canada to improve the process for allocating the Contracting Parties to Country Groups, in the peer review, was accepted. Asked about Indigenous representation on Canada's delegation, CNSC staff noted an intention on the part of Canada to have Indigenous representation as part of future Canadian delegations.

105. The Commission asked about the suggestions for Canada to meet commitments related to Canada's radioactive waste policy arising from the 2019 Integrated Regulatory Review Service (IRRS) and to conduct a future ARTEMIS mission.[22] CNSC staff explained that ARTEMIS is more focused on waste management, while the IRRS is focused on the broader regulatory framework across all SCAs. CNSC staff added that conducting an ARTEMIS mission was a common suggestion made to contracting parties. A Natural Resources Canada (NRCan) representative provided the Commission with details about NRCan's waste policy review and noted that the finalized policy would be published in the coming months. CNSC staff and the NRCan representative confirmed that Canada will fulfill the recommendations arising from the IRRS mission for the next Joint Convention peer review cycle.

106. On the topic of Canada's radioactive waste inventory, CNSC staff clarified that the reported percentages of waste are by volume. CNSC staff noted that 0.5% of Canada's radioactive waste, which does not include uranium mine and mill tailings, is high-level. Asked how the amount of high-level radioactive waste in Canada compares to other member nations, CNSC staff explained that it had not prepared a comparison but that the variation in number and age of facilities result in large differences. The Commission noted that such a comparison would provide useful context and directed CNSC staff to submit this information to the Commission when available.

Action
by
December 2022

107. The Commission asked about public interest in Canada's national report under the Joint Convention. CNSC staff stated that all Joint Convention reports are posted on the

[22] ARTEMIS is an integrated expert peer review service for radioactive waste and spent fuel management, decommissioning, and remediation programmes.

CNSC's website. CNSC staff noted that it issued errata to the 7th national report based on feedback received from members of the public, and that it would apply lessons learned to the development of the 8th national report. CNSC staff added that the report structure is technical, based on instructions from the Joint Convention.

108. An Atomic Energy of Canada Ltd. (AECL) representative provided information on the recent Auditor General's audit on low- and intermediate-level radioactive waste management in Canada. The AECL representative stated that the results of the audit were positive. The AECL representative added that AECL was addressing the audit's recommendations, including making information more easily accessible to the public.

Closure of the Public Meeting

109. The public meeting closed at 3:24 p.m. EDT on November 3, 2022. The Commission also convened for a closed session to consider security related matters following the public portion of the meeting on November 2, 2022. These minutes reflect both the public meeting itself and the Commission's consideration in the closed portion of the meeting.

110. The Commission notes the concerns raised by several intervenors that comments and recommendations made regarding past RORs have not been addressed. The Commission has directed CNSC staff to work towards the transparent resolution of intervenor recommendations and to be updated on the status of such efforts at a future meeting of the Commission. Regarding comments and recommendations made by Indigenous Nations and communities, the Commission expects CNSC staff to provide an update to the Commission on whether and how such recommendations have been, or will be, addressed, including where there are disagreements.

Action
by
October 2023

MacDonald, Daniel Digitally signed by MacDonald, Daniel
Date: 2022.12.08 08:32:42 -05'00'

Recording Secretary — Date

Saumure, Denis Digitally signed by Saumure, Denis
DN: C=CA, O=GC, OU=CNSC-CCSN, CN="Saumure, Denis"
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Location: your signing location here
Date: 2022-12-13 08:39:49
Foxit Reader Version: 9.7.1

Registrar — Date

APPENDIX A

CMD	Date	e-Docs No.
22-M30	2022-09-22	6876239
Notice of Virtual Meeting of the Commission on November 1, 2 and 3, 2022		
22-M31	2022-09-22	6841351
Agenda of the Meeting of the Canadian Nuclear Safety Commission (CNSC) to be held remotely on November 1, 2, and 3, 2022		
22-M31.A	2022-10-26	6896207
Revised agenda of the Meeting of the Canadian Nuclear Safety Commission (CNSC) to be held remotely on June 28, 2022		
22-M41	2022-	
Approval of the Minutes of Commission Meetings held on September 15, 2022		
22-M29	2022-10-19	6892957
Information Items Certification Process for Prescribed Equipment Presentation from CNSC Staff		
22-M32	2022-08-16	6851061 - English 6851044 - French
Information Items Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2021 Written submission from CNSC Staff		
22-M32.A	2022-10-18	6891627 – English 6891630 – French
Information Items Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2021 Presentation from CNSC Staff		
22-M32.1	2022-09-16	6880733
Information Items Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2021 Written submission from the Canadian Radiation Protection Association		
22-M32.2	2022-09-30	6882264
Information Items Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2021 Written submission from the Canadian Environmental Law Association		

22-M32.3	2022-10-03	6883053
Information Items Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2021 Written submission from the Nuclear Transparency Project		
22-M40	2022-	
Information Items Canada's Participation at the 7th Review Meeting of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management Presentation from CNSC Staff		
22-M42	2022-10-26	6897290
Status Report Status Report on Power Reactors Written submission from CNSC Staff		
22-M33	2022-07-21	6837033
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from CNSC Staff		
22-M33.A	2022-10-25	6893122 – English 6904058 – French
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Presentation from CNSC Staff		
22-M33.B	2022-10-28	6894190
Close Session Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from CNSC Staff		
22-M33.1	2022-09-26	6881879
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from Evelyn Gigantes		

22-M33.2	2022-09-29	6881886
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from the Canadian Nuclear Association		
22-M33.3	2022-10-04	6883356
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from the Canadian Environmental Law Association		
22-M33.4	2022-10-04	6883452
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from the Manitoba Métis Federation		
22-M33.4A	2022-10-04	6896198
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Presentation from the Manitoba Métis Federation		
22-M33.5	2022-10-04	6883493
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from the Sagkeeng Anicinabe First Nation		
22-M33.6	2022-10-04	6883514
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from the Algonquins of Pikwakanagan First Nation		
22-M33.6A	2022-10-25	6896531
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Presentation from the Algonquins of Pikwakanagan First Nation		

22-M33.7	2022-10-04	6884096
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from the Curve Lake First Nation		
22-M33.8	2022-10-04	6884103
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from the Chippewas of Kettle and Stony Point First Nation		
22-M33.9	2022-10-04	6884106
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from the Nuclear Transparency Project		
22-M33.10	2022-10-18	6892102
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from the Grand Council Treaty #3		
22-M33.10A	2022-10-25	6896633
Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Presentation from the Grand Council Treaty #3		
22-M33.11	2022-10-28	6899258
Closed Session Information Items Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2021 Written submission from the Canadian Nuclear Laboratories		
22-M34	2022-07-18	6835691
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from CNSC Staff		

22-M34.A	2022-07-18	6896594
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Presentation from CNSC Staff		
22-M34.B	2022-10-25	6835691
Closed Session Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from CNSC Staff		
22-M34.C	2022-10-26	6896609
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Presentation from CNSC Staff		
22-M34.1	2022-09-18	6874498
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Presentation from the Passamaquoddy Recognition Group Inc.		
22-M34.2	2022-09-16	6874517
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from Helmy Ragheb		
22-M34.3	2022-09-15	6874447
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from the Grand Conseil de la Nation Waban-Aki		
22-M34.4	2022-09-15	6874422
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from the Curve Lake First Nation		

22-M34.5	2022-09-15	6874572
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from the Nuclear Transparency Project		
22-M34.6	2022-09-15	6874459
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from the Canadian Environmental Law Association		
22-M34.7	2022-09-14	6874610
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from the Grey Bruce Health Unit		
22-M34.8	2022-09-16	6874614
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from the Municipality of Kincardine		
22-M34.9	2022-09-16	6874615
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from the Town of Saugeen Shores		
22-M34.10	2022-09-16	6874476
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from Gordon W. Dalzell		
22-M34.11	2022-09-16	6874618
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from the Saugeen Ojibway Nation		

22-M34.12	2022-09-16	6874621
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from the Canadian Nuclear Association		
22-M34.13	2022-09-20	6874622
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from the Wolastoqey Nation in New Brunswick		
22-M34.14	2022-09-23	6876731
Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from the Chippewas of Kettle and Stony Point First Nation		
22-M34.15	2022-10-28	
Closed Session Information Items Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2021 Written submission from Ontario Power Generation		
22-M37	2022-08-22	6848197
Information Items Update on the discovery of elevated hydrogen equivalent concentrations in the pressure tubes of reactors in extended operation: 2021 Written submission from CNSC Staff		
22-M37.A	2022-10-25	6896579 – English 6898533 – French
Information Items Update on the discovery of elevated hydrogen equivalent concentrations in the pressure tubes of reactors in extended operation: 2021 Presentation from CNSC Staff		

22-M37.1	2022-08-25	6858724
Information Items Update on the discovery of elevated hydrogen equivalent concentrations in the pressure tubes of reactors in extended operation: 2021 Written submission from Ontario Power Generation		
22-M37.2	2022-08-25	6858727
Information Items Update on the discovery of elevated hydrogen equivalent concentrations in the pressure tubes of reactors in extended operation: 2021 Written submission from NB Power		
22-M37.3	2022-08-25	6858728
Information Items Update on the discovery of elevated hydrogen equivalent concentrations in the pressure tubes of reactors in extended operation: 2021 Written submission from Bruce Power		
22-M37.4	2022-10-11	6889342
Information Items Update on the discovery of elevated hydrogen equivalent concentrations in the pressure tubes of reactors in extended operation: 2021 Written submission from Frank Greening		
22-M37.5	2022-10-17	6892445
Information Items Update on the discovery of elevated hydrogen equivalent concentrations in the pressure tubes of reactors in extended operation: 2021 Written submission from Paul Sedran		
22-M37.5A	2022-10-17	6892447
Information Items Update on the discovery of elevated hydrogen equivalent concentrations in the pressure tubes of reactors in extended operation: 2021 Presentation from Paul Sedran		

22-M37.6	2022-10-17	6892456
Information Items Update on the discovery of elevated hydrogen equivalent concentrations in the pressure tubes of reactors in extended operation: 2021 Written submission from the Canadian Nuclear Association		
22-M37.7	2022-10-18	6892468
Information Items Update on the discovery of elevated hydrogen equivalent concentrations in the pressure tubes of reactors in extended operation: 2021 Written submission from the Canadian Association of Nuclear Host Communities		