Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held on November 6–7, 2019

Minutes of the Canadian Nuclear Safety Commission (CNSC) meeting held on November 6 – 7, 2019 beginning at 9:00 am at the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, ON.

Present:

R Velshi, President
T. Berube
S. Demeter
M. Lacroix
S. McKinnon

M. Leblanc, Secretary
L. Thiele, Senior General Counsel (November 6, 2019)
D. Saumure, Senior Counsel (November 7, 2019)
W. Khan, C. Moreau and S. Dimitrijevic, Recording Secretaries

CNSC staff advisors were: G. Frappier, J. Burta, E. Lemoine, J. Sladek, A. Viktorov, L. Sigouin, J. Stevenson, K. Campbell, K. Glenn, G. McDougall, K. Sauvé, R. Richardson, A. McAllister, S. Lei, C. Cianci, L. Casterton, C. Cole, M. Rinker, W. Grant, N. Riendeau, L. Désaulniers, V. Tavasoli, S. Yalaoui, B. Torrie and G. Lemieux.

Other contributors were:

- Ontario Power Generation: G. Rose, S. Smith, L. Morton, S. Irvine, R. McCalla, J. Vecchiarelli, J. Knox, J. Duhig, I. Malek and E. Schwartz
- New Brunswick Power: J. Nouwens, K. Duguay, D. Mullins and N. Reicker
- Bruce Power: J. Scongack, M. Burton, G. Newman and L. Clewett
- Hydro-Québec: D. Olivier
- Department of Fisheries and Oceans: J. Thomas
- Canadian Standards Association (CSA) Group: S. Oh, L. Logan and C. Taylor
- Environment and Climate Change Canada (ECCC): N. Ali

Constitution

1. With all permanent members being present and although a notice of meeting was not published pursuant to section 7 of the *CNSC By-laws*,[1] the meeting was properly constituted. A Revised Notice of

[1] SOR/2000-212

Participation in a Commission Meeting and Participation Funding was published on April 10, 2019 incorporating key information that would normally be included in a notice of meeting. As per section 9 of the *Canadian Nuclear Safety Commission By-laws*, the meeting agenda was also made publicly available.

2. Since the Commission meeting held on October 3, 2019, CMD 19-M-24, CMD-19-M29 to CMD 19-M30, CMD 19-M34, CMD 19-M34.A, CMD 19-M38 to CMD 19-M38 to CMD 19-M41 and CMD 19-M43 were distributed to members. These documents are further detailed in Appendix A of these minutes.

Adoption of the Agenda

3. The revised agenda, CMD 19-M34.A, was adopted as presented.

Chair and Secretary

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

STATUS REPORT ON POWER REACTORS

5. With reference to CMD 19-M38, which includes the Status Report on Power Reactors, CNSC staff presented the following updates:

   - On November 5, 2019, CNSC staff confirmed that OPG met all the conditions for the removal of its first regulatory hold point for the refurbishment of Darlington Nuclear Generating Station (NGS) Unit 2.[2] OPG is expected to commence fuel loading of Darlington NGS Unit 2 in November, 2019.
   - Pickering NGS Unit 1 is at 91% of full power and Unit 7 is at 93% of full power. CNSC staff reported that this is due the unavailability of the fuelling machine.

6. The Commission asked for information regarding the process of fuel loading for Darlington NGS Unit 2. An OPG representative responded that the moderator system would be filled with water and that fuel loading would commence on a channel-by-channel basis, proceeding to the subsequent channels once it had been confirmed

[2] On November 5, 2019 the Executive Vice President and Chief Regulatory Operations Officer of the Regulatory Operations Brach provided a memo about removal of Fuel Load Regulatory Hold Point 1 at Darlington NGS Unit 2, which was then shared with the Commission members by the Commission Secretary.

that there were no negative effects resulting from loading the fuel. The OPG representative further added that once two thirds of the reactor was filled, multiple channels would be loaded with fuel simultaneously.

7. The Commission enquired as to whether the unavailability of the fuelling machine was due to the unavailability of parts. An OPG representative confirmed that the issue was related to the unavailability of parts and that this was an issue that both the Pickering and Darlington NGS have struggled with historically. The OPG representative further added that there was an improvement plan in place and that they were confident that the reliability of the fuel-loading machine would increase across both sites.

Update on the Potassium Iodide Pill Working Group

8. CMD 19-M38 also provided information and an update regarding the Potassium Iodide Pill Working Group (KI Working Group), which was a commitment that was made by CNSC staff during the June 2018 hearing for the licence renewal for the Pickering NGS.[3] Asked for an update on the working group, CNSC staff explained that the Phase 1 Workshop was held on November 4-5, 2019 and that 43 participants from 20 different departments, including public health representatives, emergency management coordinators, and representatives from the province of Ontario, were present. Additionally:

    - The current strategies for distributing KI pills in the event of an emergency were discussed.
    - Minutes of the meeting are currently being prepared and will be made publicly available upon approval.
    - The Phase I report is currently being drafted and will be available for a 30-45 day public review period.
    - It has been agreed by all participants that the workshop was successful.

[3] CNSC Record of Decision – Ontario Power Generation Inc., *Application to Renew the Nuclear Power Reactor Operating Licence for the Pickering Nuclear Generating Station*, published December 2018.

UPDATES ON ITEMS FROM PREVIOUS COMMISSION PROCEEDINGS

Status of Digital Control Computer (DCC) Systems – Action Item #19298

9. With reference to CMD 19-M43, CNSC staff presented an update regarding the DCC systems at Canadian NGS, as considered in the May 15, 2019 Commission meeting and in Commission Action Item #19298. The Commission had requested CNSC staff to submit a memo regarding the aging of DCC systems across nuclear reactors in Canada and how this issue was being managed.

10. The Commission asked for information regarding the testing of the emulators prior to being put into service and replacing some of the DCCs. CNSC staff responded that there was software that had been designed to test whether the new hardware was capable of the same functions and performance, which allowed the software to be installed without any modifications. CNSC staff further stated that all computers used for real-time processing such as for DCCs or trip computers, went through a categorization process that listed the level of rigidity that needed to be applied to each category. CNSC staff added that category 1 was of the highest quality assurance and was used on trip computers while the DCCs were an example of category 2. An OPG representative stated that at the Darlington NGS, all of the DCC systems had been replaced and upgraded to the latest technology and that OPG had a spares and restoration acquisition plan at Pickering NGS Units 5-8.

11. The Commission asked about whether the shutdown computer systems have a similar aging management plan as the DCCs. An OPG representative responded that, as part of the Darlington Unit 2 refurbishment, the computers for shutdown systems 1 and 2 were being replaced. The OPG representative added that OPG had an established software-testing program, which had been proven to be effective in identifying problems in the past.

12. The Commission is satisfied with the information provided. Action Item #19298 is closed.

ACTION
#19298
Closed

EVENT INITIAL REPORT (EIR)

Provincial Health Services Authority - Exposure above regulatory limit of a non-Nuclear Energy Worker

13. With reference to CMD 19-M41, CNSC staff presented information

regarding a radiation therapist of the British Columbia Provincial Health Services Authority (PHSA), not designated as a nuclear energy worker (NEW), receiving an exposure above the regulatory limit of 1mSv/year. CNSC staff reported that, in May 2019, CNSC staff was advised that a dose of 1.85 mSv was recorded on the radiation therapist's dosimeter during the period between January 1 and March 31, 2019. CNSC staff added that an exposure at this level has no health effects and that the licensee's investigation suggested that the dosimeter was exposed but that dose was not actually received by the worker and was therefore not personal.

14. The Commission enquired about the process of designating PHSA employees as NEWs. CNSC staff explained that there were more obligations on a licensee when employees were designated as NEWs, such as requirements for training, explanation of risks involved with their work and informing the workers of their dose results on a periodic basis. CNSC staff added that designating employees as NEWs depended on the licensees' management of their program and that licensees had to demonstrate that the employees' exposures would not exceed regulatory limits. CNSC staff further added that designating some positions as NEW positions may also have ramifications on collective agreements, employees' compensation and the work they were allowed to perform.

15. Further on the NEW designation, the PHSA representative indicated that there were some privacy concerns as the dosimetry service provider used by PHSA was based in the United States and that the United States government could access the employees' personal information. The PHSA representative added that the decision to use a dosimetry provider based in the United States was a provincial decision.

16. Asked about the margin of error in respect of the dosimeter reading, the PHSA representative stated that it was the PSHA's understanding that the dosimeter could measure up to an accuracy of 0.01 mSv and that unusual readings could sometimes occur. CNSC staff confirmed the minimum reportable level of 0.01 mSv and added that CNSC staff was not aware of any systematic unusual readings issues.

17. In regard to the duration of the dosimeter's monitoring period, CNSC staff stated that the monitoring period could vary depending on the licensed activity, but added that dosimeters were often worn for a three-month period. The PHSA representative indicated that PHSA employees wore their dosimeters for a period of three months and added that the employee whose dosimeter received a high reading was now also wearing a direct reading dosimeter that had been indicating doses at the background level since the event.

18. On the reason for the lateness of the reporting of this event to the Commission, CNSC staff stated that, as this was not viewed as a significant event by CNSC staff, the EIR was presented to the first public meeting held in Ottawa since its occurrence. CNSC staff added that the EIR was not submitted to the Commission Secretariat in June 2019, as it should have been, after the EIR was signed off, and that CNSC staff submitted it only in preparation for this public meeting. The Commission reaffirmed that CNSC staff will notify the Commission of any future events in a more timely manner.

19. Since the event's investigation found that the affected employee took the dosimeter home, the Commission asked whether this was a frequent practice for PHSA employees. The PHSA representative reported that the PHSA employees were instructed during training to leave their dosimeter at work but added that some workers occasionally took it home. The Commission noted that leaving the dosimeter at work was a good practice that should be ingrained in the PHSA workforce.

20. The Commission is satisfied with the information provided by CNSC staff and the PHSA on this event. Nonetheless, the Commission notes that this event demonstrates weaknesses in the PSHA's safety culture and the lack of accountability in this regard in the medical sector in general. The Commission is of the view that, in the future, more punitive measures may be needed in regard to events related to weaknesses in safety culture.

INFORMATION ITEMS

Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018

21. With reference to CMD 19-M30, CNSC staff presented its ROR for Canadian Nuclear Power Generating Sites (NPGS): 2018 (NPGS ROR). This report also included waste management facilities (WMFs) adjacent to the nuclear power plants (NPPs).

22. Key findings that were reported in the NPGS ROR included:

    - CNSC staff rated NPPs and WMFs as either "satisfactory" or "fully satisfactory" in 2018 in all safety and control areas.
    - Radiation doses to members of the public and workers were maintained well below regulatory limits in 2018.

23. Through the CNSC's Participant Funding Program (PFP), participant funding had been offered to assist Indigenous peoples, members of the public and other stakeholders in reviewing the NPGS ROR and submitting comments, in writing, to the Commission. A Funding Review Committee (FRC) – independent of the CNSC – had recommended that up to $35,000 in participant funding be provided to the following nine applicants:

    - Benoit Robert Poulet
    - Frank R. Greening
    - Grand Conseil de la Nation Waban-Aki
    - Canadian Nuclear Workers' Council
    - Power Workers' Union
    - Swim Drink Fish Canada / Lake Ontario Waterkeeper
    - Canadian Environmental Law Association
    - Anna Tilman and Eugene Bourgeois
    - Gordon Dalzell

Comments from Canadian NGS Licensees

24. Representatives from Canadian NGS licensees were invited by the Commission to submit their comments regarding the performance ratings presented in the NPGS ROR. An OPG representative commented that OPG had six fundamental commitments that are upheld throughout the entire nuclear fleet at OPG: nuclear safety; ensuring fitness for service; maintaining an engaged workforce; maintaining low impact as a result of operations; continued transparency and engagement with the public; and continuing to invest in the facilities and the workers. The OPG representative added that as per the commitment to make groundwater monitoring data publicly available, OPG had posted an interactive geographic information system (GIS) map along with the groundwater monitoring data for 2018 for both Darlington and Pickering.

25. An NB Power representative stated that NB Power welcomed the findings as presented in the 2018 NPGS ROR and stated that NB Power considered these findings as part of the Point Lepreau NGS continuous improvement process. The NB Power representative added that conventional, radiological and environmental safety was the priority for NB Power. The NB Power representative also reported that NB Power had achieved 97 out of 100 on the equipment reliability index score, a result of continuous improvements in previous years.

26. The Bruce Power representative explained Bruce Power's core value of "safety first" which included reactor safety, radiation safety, environmental safety and industrial safety. The Bruce Power representative added that Bruce Power will commence Bruce Unit 6 major components replacement and were working with OPG to capture

lessons learned from the Darlington refurbishment project. The Bruce Power representative also mentioned that continuous improvement initiatives in place at the Bruce NGS were focused on hazard identification and personal contamination events.

27. The Hydro-Québec representative described the main steps to reach the safe storage state of the Gentilly-2 NGS by 2021. The Hydro-Québec representative added that radiation doses to the workers and members of the public were below regulatory limits.

Interventions

28. Prior to considering the interventions submitted in reference to the NPGS ROR, the President of the Commission noted that several interventions for this ROR – and the two other RORs presented during this meeting – raised concerns regarding RORs, particularly in respect of procedural considerations for proceedings considering RORs and the content of RORs. The President of the Commission stated that the Commission has examined these concerns and that CNSC staff was undertaking a review of the ROR process which will include the identification of opportunities for improvement in this process, including those related to ROR content, ROR timelines, frequency of RORs and public participation in Commission proceedings considering RORs. The President also stated that CNSC staff would, in the new year, be consulting with Commission Members, licensees, Indigenous peoples, civil society organizations and members of the public with the aim of developing recommendations to address some of those concerns.

B. R. Poulet (CMD 19-M30.1)

29. With reference to the written submission from Benoit Robert Poulet, the Commission requested information regarding the status of the Direct Local Area Network (dLAN) automation at the Bruce NGS and asked how long it would take before it was functional. A Bruce Power representative responded that, as the dLAN was not compatible with the Emergency Operations Centre (EOC) program, Bruce Power developed an alternative tool that performed the same functions as dLAN by providing automated data to the CNSC EOC. The Bruce Power representative added that the tool had been tested and proved successful with the exception of minor issues that would be resolved in the near future. CNSC staff responded that the capabilities of the EOC at Bruce Power were similar to other NPPs and that they were satisfied with the progress made to date at the Bruce NGS. The Commission was satisfied with the information provided on this point.

30. The Commission asked why a Level 0 international nuclear event scale (INES) rating was given to an event that took place at Bruce NGS Unit 4. CNSC staff stated that the INES ratings are an international communications tool and are based on three considerations: the impact to the public and the environment; the impact on radiological barriers and controls; and the defence-in-depth measures in place. CNSC staff added that, as the event at the Bruce NGS Unit 4 did not result in any releases above the regulatory limits and was of low safety significance, CNSC staff arrived at an INES rating of 0. The Commission was satisfied with the information provided. However, the Commission notes that it did not see any added value of including events with INES ratings of 0 in the NPGS ROR.

31. The Commission enquired as to what had changed from a safety case point of view when changing the requirements for the testing of Bruce Power's standby generators. CNSC staff responded that, when Bruce Power submitted the request, CNSC staff reassessed Bruce Power's current practices and determined that there was no change from a risk perspective and that the safety requirements for standby generators remained the same.

32. Further on the topic of standby generators, a Bruce Power representative submitted that, as part of its asset management program, the standby generators were also being sent one by one for refurbishment. The Bruce Power representative added that, as there were three out of four backup generators available when one is sent for refurbishment, Bruce Power's proposal included ensuring that, if one of the three generators being tested failed, the remaining two would be available in case of an emergency.

33. The Commission asked for clarification regarding the terminology used in the NPGS ROR, specifically, the difference between formal comments and informal comments, as raised in the intervention from B. Poulet. CNSC staff responded that formal comments were referred to comments that were formally sent in writing to a licensee as CNSC's position on an issue, whereas informal comments were interactions between CNSC specialists and industry specialists in order to gain an understanding of an issue before making formal comments. CNSC staff added that for the particular case that was mentioned in the NPGS ROR, after review of the communications with the Pickering NGS in regard to severe accident analysis, it was found that, with the exception of comments exchanged during meetings, only formal comments were provided to the licensee. The Commission anticipates that CNSC staff will update the NPGS ROR to reflect that only formal comments had been provided.

34. Further on that topic, the Commission asked CNSC staff to explain the difference between compliant and non-compliant findings. CNSC staff responded that, during inspections, CNSC inspectors evaluated licensee programs against the applicable regulatory requirements and that the findings were determined to be compliant or non-compliant based on whether the licensee met the expectations with respect to the requirements.

F. R. Greening (CMD 19-M30.2)

35. On an issue raised by Dr. Greening stating that some waterborne radionuclide discharges were not monitored, the Commission requested additional information on the discharges at the Western Waste Management Facility (WWMF). CNSC staff responded that all waterborne emissions at OPG facilities are monitored and reported to the CNSC as part of OPG's quarterly and annual reports. CNSC staff added that the dose to the public resulting from activities at waste management facilities was combined with that of the NPPs and that these were reported as a site-wide dose.

36. The Commission requested an update on the end-of-life management program of pressure tubes and on the findings of the latest testing results for pressure tubes at the NGS. CNSC staff responded that the latest results showed that the Pickering NGS, the Darlington NGS, and the Bruce NGS Units 1-4 and 6 would not reach a hydrogen equivalent concentration ([Heq]) of 120 parts per million (ppm) before end of service or the beginning of the major component replacement project. CNSC staff further added that the remaining Bruce NGS units would reach 120 ppm [Heq] by 2023 and that Bruce Power would be required to submit a new fracture toughness model to the CNSC for review and acceptance prior to implementation.

37. Further on this topic, CNSC staff submitted that Bruce Power had confirmed that a revised model would be submitted by the second quarter of 2020 and that CNSC staff anticipated to be in a position to make recommendations to the Commission by April 2021.

38. Noting the concerns of Dr. Greening that the pressure tube data presented in Appendix G of the NPGS ROR are different from the previous year's data, the Commission requested information about the reliability of these data. CNSC staff responded that, when presenting pressure tube fracture toughness projections, instead of providing the data from the predictive models extrapolated forward in time, CNSC staff chose to provide the most recent hydrogen uptake data that were provided by the licensee as they were more relevant. CNSC staff further submitted that, for practical reasons,

including the ALARA principle, licensees typically only sampled hydrogen concentrations in 10 pressure tubes per outage, with the pressure tubes selected based on CSA N285.8-15, *Technical requirement for in-service evaluation of zirconium alloy pressure tubes in CANDU reactors*.[4]

39. The Commission requested information regarding the trend towards 120 ppm [Heq] and whether CNSC staff anticipated pressure tubes in any of the reactors reaching this limit earlier or later than originally expected. CNSC staff responded that, for the Pickering NGS, the absolute numbers had changed but the expectation that none of the pressure tubes would reach 120 ppm [Heq] before end of operations remained valid. CNSC staff added that it was previously conveyed to the Commission that some pressure tubes at Darlington might reach 120 ppm [Heq], but recent data had shown that the refurbishment project would begin before any of the pressure tubes reached the 120 ppm [Heq] limit.

40. The Commission requested information on how the pressure tube data were analyzed and how data variability is taken into consideration when assessing compliance to acceptable limits. CNSC staff responded that, as per licence requirements, licensees reported the data to CNSC staff, which were then compared with previously submitted data to analyze trends and ensure it was logical. CNSC staff added that, in the event that there were high rates of hydrogen uptake, a re-examination of a specific pressure tube may be requested and that CSA N285.8-15 also prescribes two tests that the licensees are required to conduct upon acquiring new data.

41. When asked about a concern raised by Dr. Greening that fracture toughness data reported to one decimal point was not valid as the instruments measuring [Heq] do not have that accuracy, CNSC staff responded that the intervenor was correct and that, in this context, it was not a valid number of significant figures for the [Heq] measurements. The OPG representative confirmed that, when using [Heq] model predictions for fitness for service assessments, OPG used whole numbers. The Commission suggested that, in future reporting, the confidence levels be included for any [Heq] measurements or models.

42. Due to the ongoing concerns around the pressure tube fracture toughness and [Heq], the Commission requests that CNSC staff prepare a memo providing the members with information about the mathematical and semi-empirical models used to predict the end of life of the pressure tubes.

ACTION
by
January
2020

[4] N285.8-15, *Technical requirement for in-service evaluation of zirconium alloy pressure tubes in CANDU reactors*, CSA Group, 2015.

Grand Conseil de la Nation Waban-Aki (CMD 19-M30.3)

43. The Commission asked about whether CNSC staff had considered information provided in the intervention from the Grand Conseil de la Nation Waban-Aki, on what is hunted, trapped, fished and harvested when determining what to sample during IEMP campaigns. CNSC staff responded that, prior to the IEMP campaign near the Gentilly-2 NGS, letters were sent to potentially interested groups but no response was received. CNSC staff added that, as per licence requirements, Hydro-Québec is required to engage with interested groups when carrying out environmental sampling. A Hydro-Québec representative reported that, in prior sampling in the field, the animals which the intervenor had identified as being of importance were taken into consideration to provide assurance that they were safe to consume.

Swim Drink Fish Canada / Lake Ontario Waterkeeper (Waterkeeper) (CMD 19-M30.6)

44. In considering the intervention from Waterkeeper, the Commission asked for information regarding the distribution of groundwater wells and how they are instrumented and sampled at the Pickering NGS. An OPG representative stated that the groundwater monitoring program (GMP) was designed in accordance with CSA N288.6-12 (R2017), *Environmental risk assessments at Class I nuclear facilities and uranium mines and mills*,[5] and that the three objectives of the GMP were to: confirm predominant groundwater flow characteristics; monitor changes to the on-site groundwater quality; and ensure that there is no off-site impact. The OPG representative added that there were approximately 300 groundwater wells at the Pickering NGS and that approximately 150 were monitored throughout the year and were selected based on the previous years' monitoring data and associated risk.

45. Further on that topic, the Commission enquired if there was an overall hydrogeological model for the Pickering NGS where the groundwater monitoring data was collectively analyzed and interpreted. CNSC staff responded that the groundwater can be divided into three systems: the shallow groundwater system; the intermediate groundwater flow system; and the deep groundwater flow system. CNSC staff elaborated that the groundwater within the controlled area of the site flows downwards due to the foundation drain sumps that are located approximately 11 metres below the surface and that, outside of the reactor buildings, the groundwater flows north to south, towards Lake Ontario.

[5] CSA N288.6-12 (R2017), *Environmental risk assessments at Class I nuclear facilities and uranium mines and mills,* CSA Group, 2018.

46. The Commission asked if the current groundwater wells at the Pickering NGS were capable of detecting tritium plumes. CNSC staff responded that the groundwater wells were capable of detecting tritium plumes and that in early 2018, a spike in tritium levels was detected in the Unit 1 foundation drains which resulted in OPG having to repair the wells. Asked for clarification about this tritium spike, CNSC staff responded that the groundwater was sampled for tritium on a quarterly basis but, because there was a sharp increase in tritium levels detected in early 2018, the sampling frequency was increased to weekly until normal conditions were achieved.

47. On an issue raised by Waterkeeper, the Commission asked about the intervenor's assertion that the tritium leak from the Pickering NGS Unit 1 could have been the worst groundwater contamination event in the facility's history, and whether this assertion may have been a result of the intervenor not having access to the information that had been requested. An OPG representative responded that that sampling around Lake Ontario and at the water treatment plant in Ajax following the Pickering NGS Unit 1 tritium leak did not show any signs of elevated tritium levels. The OPG representative added that OPG would continue communicating with the intervenor on this issue.

48. Further on that topic, CNSC staff reported that the objective of the groundwater monitoring system was to detect elevated levels of radionuclides and that once the leak was reported, CNSC staff required OPG to identify the source of the leak, implement repairs, and test the repairs by measuring the level of tritium in the groundwater. CNSC staff added that OPG had met all expectations related to the groundwater monitoring system and that it was satisfied with the corrective actions taken by OPG.

Canadian Environmental Law Association (CELA) (CMD 19-M30.7)

49. The Commission enquired as to the circumstances where the *Impact Assessment Act*[6] (IAA) would apply to the nuclear industry. CNSC staff responded that, under the IAA, there were the *Physical Activities Regulations*[7] that set out the designated projects that would require an impact assessment under the IAA noting that the Minister may designate a physical activity that is not prescriped by the *Physical Activities Regulations*. CNSC staff added that the IAA would only be applicable to new projects that include (but not limited to) new uranium mines and mills[8] and nuclear reactors[9] with

[6] S.C. 2019, c. 28, s. 1
[7] SOR/2019-285
[8] Section 2, paragraph 22, SOR/2019-285
[9] Section 2, paragraph 26, SOR/2019-285

a certain threshold. The Commission anticipates that CNSC staff will present the impacts of the IAA on nuclear activities at a future Commission Meeting.

50. The Commission asked if asbestos remediation work was being done as part of the refurbishment projects. CNSC staff responded that in October 2018 the *Prohibition of Asbestos and Products Containing Asbestos Regulations*[10] (Asbestos Regulations) were published and that CNSC staff worked with Environment and Climate Change Canada (ECCC) and licensees to assess the impact of the regulations and determine an implementation plan. An ECCC representative informed the Commission that, due to the concerns raised by industry that some products do not have an asbestos-free alternative, they were given an exclusion period from the regulations allowing them to phase out asbestos containing products by January 1, 2023.

51. An OPG representative reported to the Commission that OPG has a comprehensive asbestos management program that requires workers to use safe work plans and personal protective equipment when it is thought that certain products contain asbestos.

52. The Commission asked if future NPGS RORs would provide information on the licensees' progress towards compliance with the Asbestos Regulations. CNSC staff responded that, due to the large number of regulations that are applicable to licensees and outside the scope of the NSCA, licensees' progress towards compliance with the different regulations would not be covered in future NPGS RORs.

53. On an issue raised by the CELA regarding access to the Provincial Nuclear Emergency Response Plan (PNERP), the Commission enquired whether the PNERP was something that the CNSC could make available to the public. CNSC staff submitted that the PNERP was a technical study initiated by the province of Ontario to consider a wide range of aspects of a severe accident. CNSC staff added that the report was completed and presently with the Solicitor General of Ontario, and that CNSC staff would be willing to work with the intervenor upon its release.

54. The Commission requested further information on how the models used to generate the derived release limits (DRL) were validated. CNSC staff stated that the model used was published in CSA N288.1, *Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities*,[11] noting that licensees are required to update their DRLs every five years. CNSC staff added that, although

[10] SOR/2018-196
[11] CSA N288.1, *Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities*, CSA Group, year?

the models were not technically validated through conventional means, monitoring was done to determine the levels of radionuclides in the environment which were then compared to the models to assess their reliability.

55. When asked if the event reports are publicly available, CNSC staff responded that all licensees are required to report events to the CNSC as specified in REGDOC-3.1.1, *Reporting Requirements for Nuclear Power Plants, Version 2*.[12] CNSC staff added that licensees post the events as part of their Public Information and Disclosure Program (PIDP) and noted that it was the title of the event that was posted, not a description.

56. The Commission invited NGS licensees to comment on the public availability of information regarding event reports. An OPG representative submitted that OPG listed all reportable events on its external website on a quarterly basis noting that there had been a very low number of events in the past few years and that OPG had not received any information requests for event reports in 2018. A Bruce Power representative stated that, due to the low number of event reports and low interest from the public, Bruce Power did not see the benefit of adding extra information on its website about event reports. An NB Power representative responded that the title of the event reports contained sufficient information to pique the interest of a member of the public to request additional information and added that the intent of only posting the title was to create an open dialogue to ensure that information was not taken out of context. A Hydro-Québec representative submitted that there were no reportable events in 2018 so they were unable to assess the views of the public.

G. Dalzell (CMD 19-M30.9)

57. In considering the intervention from G. Dalzell, the Commission asked the licensees to comment on how they used the ROR internally and externally. A Bruce Power representative responded that externally, information regarding the ROR was shared as a first step towards engagement with Indigenous communities, and municipal and county governments. Internally, the ROR was circulated to management staff to ensure that they were aware of any issues from CNSC's perspective. The Bruce Power representative further added that the ROR gave stakeholders an opportunity to assess how Bruce Power was performing with respect to specific safety and control areas (SCAs).

[12] CNSC Regulatory Document REGDOC-3.1.1, *Reporting Requirements for Nuclear Power Plants, Version 2*, published 2016

58. An OPG representative responded that the ROR was circulated in a similar manner as the Bruce Power representative explained; the ROR was shared amongst staff resulting in a series of questions and discussions. The OPG representative added that the most beneficial part of the ROR was that it provided a third-party assessment of the work conducted by OPG.

59. A Hydro-Québec representative submitted that, internally, the ROR was very useful as it showed where Hydro-Québec was positioned from a regulatory perspective and also where efforts should be focused. The Hydro-Québec representative added that, externally, certain sections of the ROR are often summarized in plain language to accommodate community members. The Hydro-Québec representative further submitted that, in order to engage the public in discussions, an ad was posted in the local newspaper informing the public that Hydro-Québec would be participating in the Commission Meeting on the matter of the NPGS ROR.

60. An NB Power representative reported that the ROR was used internally to understand where NB Power needed to focus on safety and that externally, the ROR was shared with interested parties in order to share insights and the areas that NB Power would be focused on improving in the upcoming year.

61. The Commission extends its appreciation for the efforts deployed in this comprehensive submission, including the survey of interested persons that the intervenor had undertaken.

General Questions

62. The Commission asked for further information on the challenges related to fuel performance over the past several years. CNSC staff responded that there had been an increased number of fuel defects due to debris that had been introduced into the reactors as part of the Bruce A refurbishment. CNSC staff added that there were vibration issues that had occurred at Bruce B and that there were also some concerns with respect to deviation from fuel manufacturing specifications at Darlington NGS. CNSC staff submitted that there were a number of different challenges faced in the past few years in regard to fuel defects and noted that, although the fuel manufacturing specifications were within design parameters, the timing of these challenges resulted in minor defects for approximately two years before they were addressed.

63. The Commission asked about whether the design-life expectancy of components was compared to the actual life during maintenance and replacement. A Bruce Power representative responded that the

original design-life was always compared to actual operational data in order to be assured that new parts met their life expectancy. The Bruce Power representative added that critical components are extensively monitored and inspected to make sure that they meet the design life while other less critical components are simply replaced every ten years based on operating experience (OPEX).

64. The Commission noted the reduction in the maintenance backlog at OPG and asked about why there was an increase in unplanned transient trips, noting that the purpose of the maintenance was to increase the stability of the NGS. An OPG representative responded that due to issues with algae ingress at the Pickering NGS, there had been five unplanned transients and there were three additional manual setbacks from the additional runs later in 2018. The OPG representative added that, in order to address the algae ingress, a mitigation plan was developed which included a bubble curtain as well as predictive tools based on wind and lake currents to better determine when the algae were coming.

65. Further on the topic of unplanned transient trips, a Bruce Power representative stated that a root cause analysis was performed for every unplanned transient and that, because the focus at the Bruce NGS had been to reduce the number of backlogs, there had not been much improvement in the number of unplanned transients. CNSC staff reported that the transient trips were a result of trying to protect the equipment and not because of safety reasons. CNSC staff added that the transient trips that took place in 2018 had been reviewed and there was no evidence to support that the barriers in place to prevent releases had been challenged.

66. The Commission requested confirmation from CNSC staff and OPG that the alpha contamination event that took place at the Darlington WMF was not due to a lack of safety culture in respect of radiation protection. An OPG representative responded that, although the event provided OPG with many opportunities for improvement, it was not a result of a lack of safety culture as the overall performance was safe and that no regulatory limits were reached. The OPG representative added that as a result of the event, OPG further committed to improving its radiation protection program and had hired a third party to assess it. CNSC staff submitted that, during the refurbishment of the Darlington NGS Unit 2, opportunities for improvement were identified which led to increased regulatory oversight.

67. An OPG representative submitted that, in response to the alpha event, OPG had completed a safety culture assessment for both the Darlington and Pickering NGS and that it showed that there was a consistent and healthy safety culture with respect to nuclear safety.

The Commission asked whether the results varied between the unit under refurbishment and the rest of the units at Darlington. An OPG representative responded that the results of the safety culture assessment for the unit under refurbishment, including contractors, showed that the nuclear project safety culture is improving and that the nuclear safety performance across all 10 nuclear safety culture traits[13] has continued to improve.

68. The Commission asked for clarification regarding a statement in the NPGS ROR about the deficiencies with respect to use of procedures at the Darlington NGS. CNSC staff responded that as OPG conducted a safety culture assessment for the Darlington site, CNSC staff noticed that there were some deficiencies with respect to OPG's use of procedures. CNSC staff further submitted that OPG took appropriate corrective actions to address this issue.

69. The Commission asked why the Point Lepreau NGS was experiencing high temperatures at the reactor inlet, given that the steam generators were cleaned during refurbishment in 2012. An NB Power representative responded that although the steam generators were cleaned during refurbishment, there was still some magnetite present in the boilers, which resulted in a higher reactor inlet temperature. The NB Power representative added that a significant amount of data had been collected through inspections and used by the University of New Brunswick's Centre for Nuclear Energy Research to develop detailed models of the steam generators and primary circuits to gain a better understanding of the issue.

70. Further on the topic of high inlet temperatures, the Commission asked what the reason for the sudden phenomenon was and whether the fouling could have an impact on the reactor itself. The NB Power representative responded that this phenomenon is known amongst the CANDU reactor operators and that the CANDUs were designed in such a way that the magnetite gets deposited in the steam generators and not in the fuel. The NB Power representative added that this issue is understood and is part of the licensees' equipment management programs.

71. Referring to information provided in CMD 19-M29 for meeting item 4.4, *Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018*, to be presented on November 7 2019, the Commission asked if CNSC inspectors will also be trending towards performance-based inspection across the NGS. CNSC staff responded that because the Directorate of Nuclear Substances

[13] Institute of Nuclear Power Operators (INPO), INPO 12-012, *Traits of a Healthy Safety Culture* (Rev. 1), April 2013.

Regulation has thousands of licensees that are in various locations across Canada, it was moving towards performance-based inspections due to inspection logistics. CNSC staff added that because the NGS have site inspectors, the CNSC could access information at any time and therefore, most inspections were both performance and records based.

72. The Commission requested information regarding the delays in the implementation of certain commitments outlined in the Integrated Implementation Plans (IIPs). CNSC staff submitted that CNSC staff do allow some flexibility with respect to the dates as long as the fundamental objective of the IIP commitment has not changed.

73. An OPG representative submitted that the Darlington NGS had completed all of the planned IIP tasks for 2018 and that in 2019 to date, 74 of 99 had been completed. The OPG representative added that there were approximately 14 that might be rescheduled for 2020 and that the remaining 11 were on track. Further on that topic, an OPG representative submitted that Pickering NGS had 3 IIP items that had been pushed from 2018 to 2019 once CNSC staff was satisfied that it is safe to do so.

74. A Bruce Power representative submitted that Bruce Power had completed 33 of the 191 IIP items and that 22 of them had been closed by CNSC staff while the other 11 were being reviewed. The Bruce Power representative further submitted that there were some items that may get delayed due to delays in delivery of equipment and, in some cases, Bruce Power may ask for extensions as fitness for service assessments indicate that the equipment can operate for an additional 10 years before needing to be replaced.

75. An NB Power representative reported that Point Lepreau currently has a 5-year operating licence which was not based on an IIP. The NB Power representative further submitted that Point Lepreau was currently developing a site-wide probabilistic safety assessment (PSA) which will include an IIP.

76. The Commission requested that in future NPGS RORs, CNSC staff present how many commitments in each NGS IIP were planned, completed, reviewed and closed. **ACTION** by November 2020

77. The Commission requested a status update from Bruce Power and Point Lepreau regarding their authorizations under the *Fisheries Act*.[14] A Bruce Power representative responded that Bruce Power should have the authorization by the end of 2019 and added that it would be beneficial if the process for obtaining the authorization was

[14] R.S.C., 1985, c. F-14, Paragraph 35(2)(b)

more efficient as it took Bruce Power six years. An NB Power representative provided information about the process it had undertaken for the authorization and submitted that NB Power was waiting for a response from DFO.

78. Noting that a DFO representative was available to answer questions, the Commission asked if it would be possible for the DFO to develop a lessons learned report from Bruce Power's authorizations process in order to process future authorizations in a more timely manner. A DFO representative responded that Bruce Power's application was one of the first that the DFO had processed and that it would be beneficial to develop a lessons learned report to make the process clearer and more efficient for future applicants, including NB Power.

79. With respect to a large-break loss of coolant accident (LBLOCA), the Commission requested information regarding the new analytical approach that was used to determine that the safety margins were greater than the margins that had originally been calculated. CNSC staff responded that REGDOC-2.4.1, *Deterministic Safety Analysis*,[15] was flexible in that it allows licensees to use different methodologies to calculate LBLOCA when the frequency of an event occurrence is $1x10^{-5}$. CNSC staff added that because licensees have developed new analytical approaches which demonstrated that the frequency of a break in a pressure tube had been sufficiently low, CNSC staff allowed the use of an updated methodology.

80. The Commission asked if it was necessary to rely on a computer-based model to estimate the end-of-life of pressure tubes and whether there were any physical properties that could be measured to estimate their end-of-life. CNSC staff responded that in assessing pressure tube end-of-life models, CNSC staff considered the licensees' understanding of the phenomenon; the response from two different panels of independent review experts; and the validation of the model by comparing it with actual test data. CNSC staff further submitted that, since this issue arose in 2010, licensees had gained an extensive understanding of the mechanisms related to aging pressure tubes and that the panels that were selected for the independent reviews had extensive knowledge of both the fracture toughness of the materials and their modelling.

81. Further on this topic, CNSC staff submitted that although there had been concerns in the past that models were validated by comparing them to test results in a lab and not in actual operating environments, licensees have since removed pressure tubes from reactors to test and validate models, providing an important input into their acceptance by CNSC staff.

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[15] CNSC Regulatory Document REGDOC-2.4.1, *Deterministic Safety Analysis*, 2014.

82. The Commission asked about whether there was a formal process for transferring lessons learned from the refurbishment and MCR projects to other CNSC inspectors and NPP operators. CNSC staff responded that each division at the CNSC has a generic site-specific refurbishment plan and that the lessons learned from each refurbishment project were captured in these plans and used for other projects. CNSC staff added that all of the CNSC site supervisors have a weekly meeting via teleconference to discuss lessons learned, challenges and OPEX.

83. The Commission requested information on why there was heavy water stored on the Gentilly-2 NGS site as it was not being used. A Hydro-Québec representative responded that some of the heavy water was sold in 2014, and that Hydro-Québec was considering transferring some to a licensee and sell the rest. The Hydro-Québec representative added that all heavy water at the Gentilly-2 NGS site is expected to be removed by the end of 2020.

84. The Commission asked about when it could anticipate receiving the site-wide probabilistic safety assessments (PSA) for all NGS. CNSC staff submitted that the Commission will be presented with the site-wide PSAs for all the NPPs in 2021.

85. In relation to the ROR for Canadian Nuclear Power Generating Sites, the Commission was satisfied with the information provided and closed the following Actions Items, tracked in the CNSC Regulatory Information Bank:

- Action Item 19297 Collection of 3rd party contractor injury data for NGS
- Action Item 18711 Plain Language Summary for Future RORs
- Action Item 17559 Comparison of Unplanned Emergency Shutdown Targets for pressurized water reactors (PWRs) and boiling water reactors (BWRs)
- Action Item 17525 Pickering NGS updates on the Implementation of REGDOCs and CSA Standards
- Action Item 17523 DPRR KI Working Group (PNGS)
- Action Item 15153 Provincial Information Sharing Process for Emergencies and Exercises
- Action Item 14777 Improvements at NPPs related to Alpha Particle Events
- Action Item 14776 Bruce Power Updates regarding the *Nuclear Liability and Compensation Act*[16]
- Action Item 14763 Bruce NGS Equipment Performance
- Action Item 14762 Bruce NGS Fire Protection Non-Conformances

[16] S.C. 2015, c. 4, s. 120

- Action Item 14758 Formal Collaboration with the Saugeen Ojibway Nation (SON) in respect of Bruce NGS Operations

Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018

86. With reference to CMD 19-M29, CNSC staff presented to the Commission the annual Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018 (the UNSC ROR). This report summarized the performance of 1,520 licensees which hold 2,135 licences and are authorized by the CNSC to use nuclear substances and prescribed equipment in the medical, industrial, academic and research, commercial, and waste nuclear substance sectors. The CNSC's SCA framework evaluates the performance of licensees for 14 SCAs, which cover all technical areas of regulatory oversight. For this ROR, the safety performance of the licensees was reported to the Commission through their regulatory compliance in select and indicative SCAs: management system; operating performance; radiation protection; security, and, for the waste nuclear substance sector only, environmental protection.

87. Key results and findings of the UNSC ROR included:

- CNSC staff conducted 949 inspections, across the four regulated sectors in 2018. Overall, the licensees had satisfactory compliance ratings across all SCAs;
- The CNSC took 16 escalated compliance enforcement actions against licensees in the four regulated sectors, resulting in 13 orders and three administrative monetary penalties (AMPs);
- Radiation doses were monitored for 58,689 workers (22,799 NEWs and 35,890 non-NEWs) across the four regulated sectors, with low radiation exposures recorded;
- CNSC staff reviewed 195 events that were reported by licensees, where 190 were ranked as level 0 (no safety significance), 3 were ranked as level 1 (anomaly), and 2 were ranked as level 2 (incident) on the International Nuclear and Radiological Event Scale (INES);
- Based on the CNSC's comprehensive regulatory oversight of the licensees, CNSC staff concluded that the use of nuclear substances in Canada remained safe in 2018.

88. The public was invited to comment on the USNC ROR through written interventions, and three interventions were submitted. Through the CNSC's Participant Funding Program (PFP), participant funding had been offered to assist Indigenous peoples, members of the public and other stakeholders in reviewing the UNSC ROR and

submitting comments, in writing, to the Commission. A Funding Review Committee (FRC) – independent of the CNSC – had recommended that up to $5,500 in participant funding be provided to 2 applicants including:

- Benoit Robert Poulet
- Canadian Environmental Law Association

Interventions

B. R. Poulet (CMD 19-M29.1)

89. The Commission asked for the implications regarding a potential situation, as described in B. R. Poulet's intervention, whereby a NEW exceeded the 100 mSv regulatory limit for a five-year period. CNSC staff indicated that the *Radiation Protection Regulations*[17] specified the obligations that licensees have if a NEW receives either an acute exposure in excess of 100 mSv or an incremental exposure exceeding 100 mSv over a five-year period, including removing the NEW from work that would add to their exposure, conducting an investigation and determining the corrective actions to prevent reoccurrences. CNSC staff added that CNSC staff would assess the corrective actions implemented in response and determine whether it was necessary to specify certain conditions for the employee's return to work.

90. The Commission notes that the NSCA give CNSC designated officers the power to authorize return to work and enquired about whether the workers contaminated during the events described in the 2018 UNSC ROR were now back to work. CNSC staff reported that, of the three events reported in the 2018 UNSC ROR, two NEWs had submitted a return to work request to a CNSC designated officer, which was granted. CNSC staff added that, in these two cases, there was no recommendations for medical follow-up and no health effects were expected. CNSC staff further added that the third event involved a non-NEW, not working for a licensee, so a return to work request was not required. The Commission noted that it would have been useful to have this information in the UNSC ROR.

91. Upon request for comment about B. R. Poulet's question on the SCAs outside the four reported in the UNSC ROR, CNSC staff responded that the performance across all SCAs was monitored and assessed. CNSC staff added that its enforcement actions reflected this and provided information in regard to where there may be concerns or negative trends.

[17] SOR /2000-203

Canadian Radiation Protection Association (CMD 19-M29.2)

92. The Commission invited CNSC staff to comment on the intervention from the Canadian Radiation Protection Association (CRPA) suggesting a decline of CNSC staff's regulatory oversight of the medical sector. CNSC staff explained that CNSC staff used different enforcement tools for different sectors, further explaining that this did not represent a decline in oversight and adding that the controlled environment of the medical sector facilitated the implementation of corrective actions.

93. As the CRPA expressed the desire for further engagement with the CNSC, the Commission asked about how CNSC staff was engaging with professional organizations. Noting that the CRPA was one of the CNSC's key stakeholders, CNSC staff responded that two working groups were established with the CRPA: one focuses on the activities of the organization in the nuclear substance and prescribed equipment field and the other being a joint working group with the Canadian Organization of Medical Physicists overlooking the accelerator industry.

94. In relation to a comment from the CRPA's intervention, the Commission enquired about the level of effort that would be required for the CNSC to provide further details on events on its website. CNSC staff stated that CNSC staff's focus was on communicating the lessons with the broader regulated community, and that CNSC staff tracked and recorded events on an internal system without the capability of automatically publicly disclosing the information. CNSC staff added that, generally, there was a low level of public interest in the regulated activities considered in the UNSC ROR, with the exception of transport events. The Commission noted that CNSC staff should improve the public disclosure of information as a key stakeholder showed interest.

95. The Commission asked CNSC staff how it influenced the behaviour of regulated organizations to better support Radiation Safety Officers (RSOs). CNSC staff responded that, as RSOs needed organizational support to be successful, CNSC staff would, generally during inspections, meet with the people responsible for the licence that have decision-making capabilities and resource and financial responsibilities.

96. Further on the topic of RSOs, CNSC staff informed the Commission that CNSC staff was developing a regulatory document, REGDOC-1.6.2, *Developing and Implementing an Effective Radiation Protection Program for Nuclear Substances and Radiation Devices*

Licences,[18] to provide regulatory guidance to RSOs. CNSC staff added that the new guidance would enhance the CNSC's existing compliance promotion strategy to support RSOs with their continuous improvement activities.

97. CNSC staff added that the intent of REGDOC-1.6.2 was to provide guidance to licensees on how to establish and implement an effective radiation protection program which complies with regulatory requirements. CNSC staff added that REGDOCs were periodically reviewed and modified allowing CNSC staff to address its field observations. The Commission was satisfied with the information provided.

98. The Commission enquired about whether the declining trend in performance in the medical and industrial sectors, as raised in the intervention from the CRPA, could be the result of safety culture issues in respect of radiation protection. CNSC staff noted that performance-based inspections found indications of inadequate safety culture such as worker non-compliance with procedures, lack of management oversight and lack of internal audit programs. CNSC staff added that staff had been actively promoting the awareness and use of the regulatory document that the CNSC has developed on safety culture, and encouraging licensees to apply those principles.

Canadian Environmental Law Association (CMD 19-M29.3)

99. On the suggestion made by the Canadian Environmental Law Association (CELA) to refer to key international standards in the UNSC ROR, CNSC staff informed the Commission that alignment with international standards was implemented as CNSC staff developed new regulatory documents.

100. In considering the intervention from CELA, the Commission enquired about the level of effort allocated to reactive inspections versus planned ones. CNSC staff stated that about 30 % of the inspection campaign was allocated to reactive work. CNSC staff added that CNSC staff was not tracking the number of announced versus unannounced inspections but that the annual planning cycle allowed staff to prioritize a certain area, subsector, or type of inspection.

101. The Commission asked about the differences between the non-compliances found by CNSC staff during announced and unannounced inspections. CNSC staff indicated that announced

[18] CNSC Regulatory Document, REGDOC-1.6.2, *Developing and Implementing an Effective Radiation Protection Program for Nuclear Substances and Radiation Devices Licences*, Currently under development.

inspections allowed the licensees to review their program and self-identify their issues, thus improving their compliance with CNSC's regulatory requirements on their own. CNSC staff added that unannounced inspections would more likely discover more minor non-compliances that the licensees might have resolved if the inspections were announced. CNSC staff further added that the data analysis for the UNSC ROR did not distinguish whether the findings came from an announced or unannounced inspection.

102. In regard to CELA's intervention, the Commission enquired about the risks associated with CNSC staff's revised inspection strategy of increasing the focus on the medium-risk licensees. CNSC staff explained that CNSC staff was confident that the high-risk licensee sector was at a stable level as opposed to a declining level, and that it was CNSC staff's view that the medium-risk licensees needed additional regulatory attention. CNSC staff added that moving some resources to the medium-risk sectors did not mean that CNSC staff would ignore the high-risk licensees.

103. In relation to the level of oversight, noting that more inspections resulted in more non-compliance findings, the Commission enquired about how CNSC staff assessed licensee performance if CNSC staff performed fewer, more time-consuming field inspections, resulting in fewer non-compliance discoveries. CNSC staff indicated that the performance trends provided in the UNSC ROR were based on percentage of observations, which helped to normalize the compliance inspection results.

General Questions

104. The Commission enquired about the medical sector NEW who had received a dose between 20 and 50 mSv in 2018. CNSC staff explained that the licensee's initial report indicated a dose that was higher than that which was actually received by the worker and that this was a data entry error for this particular licensee.

105. Asked about the regulation and compliance process for the CNSC Laboratory, itself a licensee, CNSC staff explained that oversight of the CNSC Laboratory was carried out in the same manner and with the same rigour as for any other licensee, with a RSO assigned to manage the radiation protection program at the site. CNSC staff added that it used CNSC staff specialists not involved with the CNSC Laboratory when needed.

106. Further on the regulatory oversight of the CNSC Laboratory, the Commission asked whether any non-compliances were observed in 2018. CNSC staff indicated that there had historically been some challenges in the CNSC Laboratory program that had led to the program being revised, but that there was nothing to report for 2018.

107. The Commission asked about whether CNSC staff performed any statistical analyses, using tools such as machine learning techniques, with the information gathered from the compliance inspections. CNSC staff reported that it collected upwards of 30,000 data points through compliance inspections, but added that trending and data analyses were performed manually. CNSC staff also explained that CNSC staff wanted to explore how different statistical tools could be used in the future.

108. Further on addressing CNSC staff's interpretation of the data from compliance inspections, CNSC staff reported that annual analytics of the compliance data allowed CNSC staff to form hypotheses, and adapt and test those hypotheses. CNSC staff added that it did not rely only on analytical trends in performance to adjust the focus of inspection, but also on input from CNSC staff inspectors. CNSC staff also gave an example where implementing a new regulatory document could increase the number of non-compliances found during inspections.

109. Further on the implementation of new regulatory expectations, CNSC staff indicated to the Commission that CNSC staff had implementation strategies for every change in regulatory expectations and added that the changes were communicated to licensees before any compliance inspections.

110. Noting the importance of informing key decision makers at licensees such as hospitals, the Commission enquired whether CNSC staff was communicating concerns with the appropriate level of a licensee's management. CNSC staff reported that it recognized the importance of engaging with a licensee's leadership team regarding radiation safety management and added that CNSC staff issued AMPs directly to the applicant authorities and not to the RSOs. CNSC staff further added that publicly posting all regulatory actions on CNSC's website had a positive impact on the licensees' management focus and the attention of licensees' executives.

111. With respect to the elevated number of non-compliances in the medical sector, CNSC staff stated that the trend was observed across Canada. CNSC staff added that there could be multiple reasons for the non-compliances such as: a number of provinces using a regional coordination and regional management of hospitals; a shortage of qualified people in some regions; or aging populations in certain areas of the country or younger demographics in other ones. CNSC staff added that private clinics were also managed differently than hospitals.

112. The Commission enquired about whether CNSC staff ever contemplated the idea of implementing a national registry database for sealed sources and portable gauges as was done in the United States. CNSC staff stated that, with its current licensing approach, CNSC staff was tracking and recording inventories on an annual basis and was able to track the location of all high-risk sources in Canada. CNSC staff added that feedback from an International Regulatory Review Service (IRRS) mission in the fall of 2019 suggested that CNSC staff look at different authorization tools or approaches regarding the lower-risk sources to lower the administrative burden on licensees. CNSC staff further reported that it addressed part of the IRRS mission's suggestion through simplifying licence application requirements and changing the inspection focus to focus on the higher-risk activities.

113. Asked about the effectiveness of CNSC staff oversight of the use of nuclear substances in Canada, CNSC staff stated that, every five years, CNSC staff looked at whether performance trends changed and evaluated whether its program was still appropriate and effective. CNSC staff further added that the impact of different regulatory tools could be measured through compliance inspections.

114. Commenting on the currently available 2019 inspection results for the portable gauge licensees, CNSC staff stated that it was seeing good performance midway through the current inspection plan and that, so far in 2019, fewer orders had been issued to portable gauge licensees compared to 2018.

115. The Commission enquired about the responsibility to report the detection of radioactive material to the CNSC by the metal recycling industry and how it was enforced despite the metal recycling industry not being regulated by CNSC staff. CNSC staff explained that the *Packaging and Transport of Nuclear Substances Regulations, 2015*[19] contained specific requirements around notification, applicable to all Canadians and not just licensees. CNSC staff added that it had an outreach program directed specifically at the recycling industry and gave an example where a recycling company identified a fixed gauge and notified CNSC staff.

116. Further on the metal recycling industry, the Commission asked whether it was a requirement for the recycling companies to have onsite radiation detection equipment. CNSC staff indicated that the metal recycling industry was regulated by the provinces and added that most metal recycling companies were monitoring trucks for radiation when they entered the company's site. CNSC staff also

[19] SOR/2015-145

stated that the radiation detectors used by these companies were measuring gamma radiation but could not detect alpha radiation.

117. The Commission expressed its satisfaction with the comprehensiveness of the information provided in the UNSC ROR. The Commission noted the effectiveness of explaining information through real-life examples and encouraged CNSC staff to use such examples in future presentations, as applicable.

Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018

118. With reference to CMD 19-M24, CNSC staff presented to the Commission its first Regulatory Oversight Report (ROR) for sites operated by Canadian Nuclear Laboratories (CNL) covering the 2018 calendar year (CNL ROR). The CNL ROR encompasses a summary of CNSC staff's regulatory oversight of the operations at the following sites:

- Chalk River Laboratories (CRL) and Whiteshell Laboratories (WL);
- remediation sites related to the Port Hope Area Initiative (PHAI) including the Port Hope Project (PHP) the Port Granby Project (PGP); and
- sites with prototype power reactors including Douglas Point (DP), Gentilly-1, (G-1) and the Nuclear Power Demonstration (NPD) waste facility.

All of these sites are owned by Atomic Energy of Canada Limited (AECL), with CNL as the licensee responsible for the safe operation of these sites under a government-owned, contractor-operated (GoCo) model.

119. CNSC staff submitted that its regulatory oversight activities included field inspections, desktop reviews and technical assessments of CNL reports and related documents. CNSC staff also provided detailed information about the inspections conducted during 2018 and the resulting enforcement actions. CNSC staff submitted performance ratings for all fourteen SCAs and reported that, with one exception related to the security SCA at WL which was rated as “below expectations,” all SCAs, for all licensed activities at the CNL sites were rated as “satisfactory.”

120. The Commission invited Indigenous peoples, members of the public and other stakeholders to comment on the CNL ROR through written interventions. Nine interventions were received. In the spirit of

reconciliation and in recognition of the Indigenous oral tradition for sharing knowledge, Indigenous peoples intervening in this meeting item were able to provide the Commission with oral presentations in addition to their written submissions.

121. Through the CNSC's Participant Funding Program (PFP), participant funding had been offered to assist Indigenous peoples, members of the public and other stakeholders in reviewing the CNL ROR and submitting comments, in writing, to the Commission. A Funding Review Committee (FRC) – independent of the CNSC – had recommended that up to $50,021 in participant funding be provided to 6 applicants including:

- Algonquins of Ontario
- Canadian Environmental Law Association
- Concerned Citizens of Renfrew County
- Lake Ontario Waterkeeper and Ottawa Riverkeeper
- Manitoba Metis Federation
- Kebaowek First Nation

Comments from CNL Representatives

122. CNL provided a brief account of the main activities at CNL sites, explaining that these included the development of nuclear science and technology capabilities and services, as well as research and development programs.

123. Asked by the Commission to comment on the CNL ROR and whether CNL considered such annual reports to be beneficial, the CNL representative responded that CNL concurred with the findings in the CNL ROR and CNSC staff's conclusions, noting that having a complete assessment of its performance documented by CNSC staff, and how it compared to CNL's own assessment, was advantageous.

Interventions

<u>Kebaowek First Nation (CMD 19-M24.10)</u>

124. In the oral presentation from the Kebaowek First Nation (KFN), the KFN representative informed the Commission about the KFN's members, their rights and traditional territory, their use of this traditional territory, and the position of this First Nation among the recognized communities part of the Algonquin Nation in Canada. The representative raised a number of issues, emphasizing those related to consultation and the engagement of the KFN regarding waste management and the protection of the environment. The representative submitted that the KFN had not been adequately

consulted regarding Environmental Impact Statements (EIS) related to the CRL site and the establishment of the IEMP.

125. The Commission sought information regarding how the CNSC would proceed in building a relationship with the KFN. CNSC staff responded that it was committed to establishing a meaningful relationship with the KFN and that it had started a dialogue with the KFN in order to involve it in ongoing CNSC regulatory processes. CNSC staff further stated that it was committed to ensuring that the KFN has the opportunity to participate in the processes that are of most interest to them and that the KFN's rights and interests are reflected in the CNSC's work.

126. The Commission asked for clarification of the term "duty of care," which the KFN had raised in its presentation. The KFN representative responded that the term "duty of care" represented the relationship and the deep connection that First Nations have with their lands, waterways, animals and other components of the nature. The KFN representative further explained that the duty of care could be better understood in the context of customary law, and that it is taught by the Elders to share their experience of how to care for the lands, rather than their management.

127. Asked about customary law, the KFN representative explained that this was a new area of Canadian jurisprudence, reflected learnings provided by the Elders, and that these are set into a law of how one would interact with the lands. The KFN representative further explained that customary law also ordered the landscape into its own classification system, showing how everything is connected, and noted that this was a type of Indigenous science.

128. The Commission asked about the KFN's current use of the land in the vicinity of the CRL site. The KFN representative responded that the waterways in the vicinity of the CRL site, as well as tributaries of the Ottawa River, were used by KFN members for fishing and other traditional activities.

129. Asked about whether the KFN had previously presented to the Commission, the KFN representative responded that this was the KFN's first time before the Commission. The KFN representative submitted that the KFN did not have the capacity to engage with the CNSC's complex processes and that, to allow for more effective engagement with the CNSC, efforts needed to be directed towards capacity building and the provision of information about the IAA, the NSCA and how the CNSC's processes work.

Algonquins of Ontario (CMD 19-M24.2)

130. The Commission sought an explanation of the methodology used to define the "representative person" for the purpose of establishing the public dose, as raised in the intervention from the Algonquins of Ontario. The CNL representative explained the methodology that was provided for by CSA standards, noting that one component comprised a household survey, including Indigenous households, in close proximity to the CRL site with the survey comprising questions about potential dose contributors. The CNL representative added that survey results combined with environmental monitoring results provided for the determination of an associated potential dose consequence for a representative person.

Municipality of Port Hope (CMD 19-M24.3)

131. In considering the written submission from the Municipality of Port Hope, the Commission enquired about whether the property contamination and remediation issues had been clearly discussed with the public. CNSC staff responded that the Municipality of Port Hope and CNL had engaged the impacted homeowners and that some landowners have not expressed a desire to have their properties remediated, presenting particular challenges in CNL's remediation efforts. The CNL representative informed the Commission that CNL was working to resolve these remediation challenges through more intensive community involvement, noting that CNL's remediation activities depend on landowners' permission to access and remediate the properties.

Manitoba Metis Federation (CMD 19-M24.5)

132. In considering the written submission from the Manitoba Metis Federation (MMF), the Commission asked CNL to comment on the request that CNL provide safety reports to the MMF. The CNL representative responded that CNL had started to work with the MMF in order to better understand and accommodate its request.

133. The Commission further enquired on the role of CNSC staff in the provision of safety reports. CNSC staff responded that environmental monitoring results are publicly available and that it was committed to continuous engagement, including monthly teleconferences, with the MMF. CNSC staff further and stated that, through these regular meetings, CNSC staff would be in a better position to understand the MMF's information requests.

Canadian Environmental Law Association (19-M24.6)

134. The Canadian Environmental Law Association (CELA), in its written submission, raised the question of the fuel cycle program risk classification and the Commission asked for more detail on the methodology used to develop the risk classification. CNSC staff responded that the risk classification used by the CNSC had been updated in 2017 and 2018, and that a CSA Group standard provided for the classification process and related methodology. CNSC staff also stated that the International Organization for Standardization (ISO) standards ISO 31000:2018, *Risk management*[20]and IEC 31010:2019, *Risk management – Risk assessment techniques*[21] were correlated with the CSA Group standard.

135. CELA also expressed a concern about the climate change resiliency of CNL's facilities and the Commission enquired about how climate change had been factored into ensuring the long-term stability of CNL sites. CNSC staff responded that the resiliency of CNL sites to climate change had been examined through safety analyses which included the consideration of external events such as extreme precipitation, flooding and seismic activity.

136. The Commission enquired about the adequacy of the water treatment facilities for the PHP and the PGP. The CNL representative responded that additional water storage capacity was added at both sites and that the reactivation of the old waste water treatment plant as extra capacity has been part of CNL's water management contingency plan.

Lake Ontario Waterkeeper and Ottawa River Keeper (CMD 19-M24.7)

137. Following the recommendation submitted by the Lake Ontario Waterkeeper (LOW) and the Ottawa River Keeper (ORK) that CNL make all monitoring results concerning fish impingement and entrainment publicly available, the Commission asked about the availability of this data. CNL representatives responded that information on fish impingement and entrainment, in terms of numbers, biomass, species, was available on CNL's website.

138. Considering the general availability of information to the public as raised by LOW and ORK, CNSC staff noted that nuclear substance and Class II nuclear facility licences were available on the CNSC website, while the other licences were available upon request. The

[20] ISO 31000:2018, *Risk Management*, International Organization for Standardization, 2018.
[21] IEC 31010:2019, *Risk management – Risk assessment techniques*, International Organization for Standardization, 2019.

CNL representatives stated that CNL did not post their licences on their website, but would provide the licence to the public if requested. The Commission noted the importance of providing the public with easier access to such documentation and recommended that CNL review its policy in respect of posting documentation such as licences on its public website. The CNL representative indicated CNL's commitment to posting its CNSC licences on its website.

ACTION
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June 2020

139. Following the issues related to tritium and strontium plumes at the CRL site, as raised by LOW and ORK, the Commission asked for more detail regarding these plumes. CNSC staff responded that the plumes were closely monitored and that CNSC staff was satisfied with the means by which those plumes had been assessed and accounted for by CNL in its risk assessment.

Concerned Citizens of Renfrew County and Area (CMD 19-M24.9)

140. In its intervention, the Concerned Citizens of Renfrew County and Area (CCRCA) made a recommendation "*that CNSC reconsider its opposition to the mandatory environmental assessment of new nuclear reactors and recommended that such assessments be required*;" (recommendation #10). The Commission sought clarification regarding this recommendation. CNSC staff stated that this recommendation did not accurately reflect the CNSC's position and that the CNSC would adhere to the current regulatory framework, which includes the IAA, noting that extensive public consultation had informed the determination of the types of projects which would require an impact assessment.

General Questions

141. The Commission enquired about the estimated time for completion of the HEU repatriation activities at CRL. The CNL representative responded that the scheduled end of HEU repatriation was mid-2020.
142. The Commission sought more information regarding the inspection related to the installation of the baseline system for the PHP long-term waste management. CNSC staff responded that the purpose of the inspection was to verify whether requirements were met at the PHP long-term waste management facility and that all resulting actions had been closed.

143. The Commission further asked about the long-term monitoring at the PHP waste management facility and about how potential leaks would be tracked. CNSC staff responded that long-term monitoring was conducted through a series of groundwater monitoring wells surrounding the PHP long-term waste management facility.

144. The Commission sought detail regarding some reticence amongst CNL employees in raising issues with the employer. CNSC staff explained that it had conducted interviews as part of the focused inspections at CNL sites and that, although CNL employees did not, in general, have concerns about being able to raise safety-related concerns, there was some reluctance among CNL employees to raise issues. CNSC staff informed the Commission that, following the inspections, CNSC staff requested that CNL conduct a safety culture self-assessment and report on the results to the CNSC.

145. Further on this topic, the CNL representative stated that CNL conducted the assessment at CRL using the methodology as described in REGDOC-2.1.2, *Safety Culture*.[22] The CNL representative explained that the assessment had shown that the main reason for the reticence in raising issues was that CNL employees did not feel that CNL would address the concerns raised. The CNL representative informed the Commission that, in response, CNL had added several additional actions to its safety culture improvement plan.

146. Noting that the dosimetry results shown in the CNL ROR were well within regulatory limits, the Commission asked about the monitoring of the non-NEWs present at the CNL sites. The CNL representative explained that the designation of CNL employees and contractors as NEWs depended on the work they carried out, with non-NEWs supplied with thermoluminescent dosimeters on an as-needed basis. The CNL representative added that visitors to CNL sites were either supplied with dosimeters or their doses were estimated from the fixed dosimeters in the facilities.

147. The Commission enquired about waste management monitoring, tracking, and recordkeeping. The CNL representative informed the Commission that all waste was bar-coded and that records were maintained in databases. CNSC staff added that all licensees are required to maintain records that include waste's origin, characteristics and activity, with CSA Group standards and REGDOCs specifying how long waste management records needed to be kept.

148. Asked about methods used to prevent ground contamination from becoming airborne during remediation activities, the CNL representative explained that different water- or chemical-based techniques had been used for dust control, as well as trapping mechanisms used for the packaging and transportation of contaminated materials, as required under the *Transportation of Dangerous Goods Act, 1992*.[23]

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[22] CNSC Regulatory Document REGDOC-2.1.2, *Safety Culture*, 2018.
[23] S.C. 1992, c. 34

149. The Commission sought clarification regarding the establishment of action levels at the CNL sites. CNSC staff explained that action levels are site-specific and proposed by a licensee, but are subject to acceptance by CNSC staff. With respect to the specific case of the PHAI, as noted by the Commission, for which the total effective dose action level had been raised to 3 mSv over a period of four weeks, CNSC staff noted that CNL had also implemented an additional action level of 10 mSv per year.

150. The Commission enquired about the source of the iodine-131 and argon-41 releases at the CRL site. CNL representatives submitted that the National Research Universal reactor, which had been operating until the end of March 2018, was the source of these releases and that CNL did not expect that there would be such releases in 2019.

151. The Commission was satisfied with the information provided in the CNL ROR and thanked the intervenors for their submissions for this meeting item. The Commission noted several minor errors in the CNL ROR and recommended some small improvements to the Executive Summary to make it more stand-alone prior to publication of the CNL ROR.

2019 Annual Program Report, Regulatory Framework Program

152. With reference to CMD 19-M39, CNSC staff provided an update on the modernization of the CNSC's regulatory framework program (RFP):

- The goal of the RFP is to have in place all requirements and expectations clear for the licensees, the public, Indigenous peoples and other stakeholders.
- CNSC staff is making steady progress to finish updating the CNSC's legacy regulatory documents by 2021, having published 48 REGDOCs.
- The Government of Canada is implementing a regulatory framework modernization agenda aimed at reducing regulatory burden and to facilitate competitiveness and innovation. This will support CNSC's objective of becoming a modern and agile regulator.

153. The Commission enquired as to what role the Department of Justice (DOJ) plays with respect to the regulatory framework program. CNSC staff responded that it provided the DOJ with drafting instructions for regulations and that the DOJ is responsible for drafting the regulations. CNSC staff added that there had been delays as the government priorities were to publish the IAA and the

Cannabis Act.[24] In order to expedite the process, CNSC staff intends to bundle several regulations together and submit them collectively.

154. The Commission asked if, within the CNSC, regulations were trending towards performance-based regulations rather than prescriptive. CNSC staff responded that performance-based regulations were effective in allowing innovations such as the small modular reactors (SMRs) and, therefore, some regulations are moving towards a performance-based format. CNSC staff further noted that, in some areas such as security, it remained better to be prescriptive. CNSC staff added that, compared to the United States and the United Kingdom, Canada has a good balance between prescriptive and performance-based regulations.

155. The Commission asked if CNSC staff had a strategy to understand disruptive innovation and emerging technologies. CNSC staff responded that within the management structure that oversees the regulatory framework, there was a working group that was looking at reactor technologies and how other technologies could have an impact on how work is done at NGS, including technologies such as 3D printing and artificial intelligence.

156. The Commission enquired as to whether there was a regulatory document for knowledge management. CNSC staff responded that, although there is no specific regulatory document with respect to knowledge management, other requirements for regulatory aspects such as management systems and training covered aspects of knowledge management.

Presentation by Canadian Standards Association (CSA) Group

157. With reference to CMD 19-M40, representatives from CSA Group presented the following information to the Commission:

- The CSA Group has over 10,000 members and provides standards for both Canada and the international community in various fields such as occupational health and safety, nuclear, and sustainability.
- The CSA Group being the largest standards developer in Canada, has over 5,000 references to standards in federal, provincial, and territorial regulations.
- The process involved with developing standards is transparent and brings together various expertise from different fields of study.

[24] S.C. 2018, c. 16

158. When asked if there were other groups in Canada that made standards similar to the CSA Group, a CSA Group representative reported that there are many other organizations that develop standards, noting that the CSA Group was the largest standards development organization in Canada.

159. The Commission further asked about which organization would be the most recognized standard developer in the world within the nuclear industry. A CSA Group representative responded that, within the nuclear industry, the CSA Group was the only one in Canada and that internationally, the IAEA and the American Society of Mechanical Engineers (ASME) both published a high number of standards.

160. The Commission asked about whether CSA standards were aligned with international standards, such as IAEA standards. A CSA Group representative responded that, when developing standards for the Canadian nuclear industry and to avoid any duplication of effort, the CSA Group assessed whether there were other international standards that addressed those requirements and if one specific to the Canadian nuclear industry was needed.

161. The Commission asked about whether Canadian standards were a benchmark for nuclear industry across the world. A CSA Group representative responded that the available CSA standards that pertain to the nuclear industry are about CANDU technology and that, because there were other types of reactor technologies being used around the world, it was difficult to assess whether Canadian standards were the benchmark.

162. The Commission asked for information on how the CSA Group ensures that participants in technical committees did not have a conflict of interest. A CSA Group representative responded that there are criteria that participants must meet and that the Chair of the specific committee reviewed the membership applications to prevent such conflicts of interest. The CSA Group representative added that the criteria included relevant technical expertise, history of participation, geographic representation and availability.

Closure of the Public Meeting

163. The public meeting closed at 4:03 p.m. on Thursday November 7, 2019.

Charles Morgan — FEB 10 2020

Recording Secretary — Date

Recording Secretary — FEB 10 2020

Date

for S. Dimitrijevic — FEB 10 2020

Recording Secretary — Date

FEB 10 2020

Secretary — Date

APPENDIX A

CMD	Date	e-Docs No.
19-M34	2019-10-16	6013637
Agenda of the meeting of the Canadian Nuclear Safety Commission to be held on Wednesday and Thursday, November 6-7, 2019 in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario		
19-M34.A	2019-10-31	6022162
Updated agenda of the meeting of the Canadian Nuclear Safety Commission to be held on Wednesday and Thursday, November 6-7, 2019 in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario		
19-M38	2019-11-01	6033385
Status Report Status of power reactor facilities as of October 30, 2019 Submission from CNSC Staff		
19-M43	2019-10-28	6030605
Update on an item from a previous Commission proceeding Status of Digital Control Computer Systems – Action Item #19298 Submission from CNSC Staff		
19-M30	2019-09-06	5977745
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Submission from CNSC staff		
19-M30.A	2019-10-30	6031094
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Supplementary submission from CNSC staff		
19-M30.B	2019-11-06	6031090
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Presentation from CNSC staff		
19-M30.1	2019-09-17	5997345
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Submission from Benoit Robert Poulet		
19-M30.2	2019-09-19	6000537
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Submission from Frank R. Greening		

19-M30.2A	2019-10-02	6014555
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Supplementary submission from Frank R. Greening		
19-M30.3	2019-10-02	6014560
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Submission from the Grand Conseil de la Nation Waban-Aki		
19-M30.4	2019-10-07	6014565
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Submission from the Canadian Nuclear Workers' Council		
19-M30.5	2019-10-07	6014569
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Submission from the Power Workers' Union		
19-M30.6	2019-10-07	6014576
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Submission from Swim Drink Fish Canada / Lake Ontario Waterkeeper		
19-M30.6A	2019-10-30	6032272
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Supplementary submission from Swim Drink Fish Canada / Lake Ontario Waterkeeper		
19-M30.7	2019-10-09	6014860
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Submission from the Canadian Environmental Law Association		
19-M30.8	2019-10-10	6016951
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Submission from Anna Tilman and Eugene Bourgeois		
19-M30.9	2019-10-11	6016960
Information Items Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2018 Submission from Gordon Dalzell		

19-M39	2019-10-17	6020812
2019 Annual Program Report, Regulatory Framework Program Presentation from CNSC Staff		
19-M40	2019-10-31	6032749
Presentation by CSA Group CSA Standards Nuclear Program		
19-M29	2019-09-04	5985236
Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018 Submission from CNSC Staff		
19-M29.A	2019-10-30	6031032
Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018 Presentation from CNSC Staff		
19-M29.B	2019-10-29	6029854
Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018 Supplementary submission from CNSC Staff		
19-M29.1	2019-09-19	6000536
Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018 Submission from Benoit Robert Poulet		
19-M29.2	2019-09-30	6008111
Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018 Submission from the Canadian Radiation Protection Association		
19-M29.3	2019-10-14	6018318
Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018 Submission from the Canadian Environmental Law Association		
19-M41	2019-10-16	6019982
Event Initial Report Provincial Health Services Authority Exposure above regulatory limit of a non Nuclear Energy Worker Submission from CNSC Staff		
19-M24	2019-09-05	5926886
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Submission from CNSC Staff		
19-M24.A	2019-10-29	6030151
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Presentation from CNSC Staff		

19-M24.10	2019-10-09	6015369
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Submission from the Kebaowek First Nation		
19-M24.10A	2019-10-30	6032222
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Revised submission from the Kebaowek First Nation		
19-M24.10B	2019-10-30	6032232
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Submission from the Kebaowek First Nation		
19-M24.2	2019-10-07	6014439
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Submission from the Algonquins of Ontario		
19-M24.3	2019-10-02	6014425
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Submission from the Municipality of Port Hope		
19-M24.4	2019-10-07	6014431
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Submission from the Power Workers' Union		
19-M24.5	2019-10-07	6014455
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Submission from the Manitoba Metis Federation		
19-M24.5A	2019-10-30	6032203
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Supplementary submission from the Manitoba Metis Federation		
19-M24.6	2019-10-07	6014495
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Submission from the Canadian Environmental Law Association		
19-M24.7	2019-10-07	6014519
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Submission from Lake Ontario Waterkeeper And Ottawa Riverkeeper		

19-M24.7A	2019-10-30	6032342
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Supplementary submission from Lake Ontario Waterkeeper and Ottawa Riverkeeper		
19-M24.8	2019-10-07	6014524
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Submission from the Canadian Nuclear Workers' Council		
19-M24.9	2019-10-09	6015352
Information Item Regulatory Oversight Report for Canadian Nuclear Laboratories (CNL) Sites: 2018 Submission from Concerned Citizens of Renfrew County and Area		