Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting Held on December 13-14, 2017

Minutes of the Canadian Nuclear Safety Commission (CNSC) meeting held Wednesday and Thursday, December 13 and 14, 2017, beginning at 9:00 a.m., both days, at the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, ON.

Present:

M. Binder, President
Dr. S. McEwan
Dr. S. Soliman
Dr. S. Demeter
Mr. R. Seeley

M. Leblanc, Commission Secretary
K. McGee, Assistant Secretary
L. Thiele, Senior General Counsel
S. Baskey, C. Moreau and S. Smith, Recording Secretaries

CNSC staff advisors were: R. Jammal, P. Elder, G. Frappier, H. Tadros, C. Moses, K. Murthy, M. Young, S. Eaton, R. Rashapov, M. Rinker, M. Jones, C. Ducros, L. Donnelly, K. Glenn, C. Cattrysse, M. Ilin, C. Dodkin, J. Amalraj, R. Lojk, J. Glover, K. Lange, K. Sauvé, R. Lane, C. Purvis, J. McManus, R. Goulet, G. Groskopf, Q. Zheng, K. Heppell-Masys, N. Riendeau, A. Persaud, H. Khouaja, D. Newland, Y. Akl, S. Yalaoui, C. Cole, K. Owen-Whitred, D. Moroz, J. Sample, P. Burton, M. Mehdi, J. Leclair and B. Gracie.

Other contributors were:

- Ontario Power Generation: R. Manley, S. Burns, B. Vulanovic R. McCalla, J. Vecchiarelli and C. Lorencez
- Cameco Corporation: L. Mooney and T. Smith
- Bruce Power: M. Burton
- NB Power: S. Waycott
- Canadian Nuclear Laboratories: S. Cotnam
- BWXT Nuclear Energy Canada: J. MacQuarrie, S. Forsey and D. Snopek
- SRB Technologies: S. Levesque
- Nordion: R. McGregor, M. Epp, R. Wassenaar, J. Mahoney, J. Kavanagh and R. Decaire
- Best Theratronics: M. Soleimani
- Areva Resources (Canada) Inc.: D. Huffman and T. Searcy
- Rio Algom: A. Blier
- Denison Mines: J. Lowe
- Kinetrics: P. Lawrence
- CANDU Energy Inc.: A. Lee
- Saskatchewan Ministry of Environment: T. Moulding
- Saskatchewan Ministry of Health and Northern Population Health Unit: J. Irvine
- Saskatchewan Ministry of the Economy: K. Cunningham
- Health Canada: B. Ahier

Constitution

1. With the notice of meeting CMD 17-M58 having been properly given and all permanent Commission members being present, the meeting was declared to be properly constituted.

2. Since the meeting of the Commission held November 9, 2017, Commission member documents (CMD) 17-M45, 17-M47, 17-M51, 17-M56, 17-M59.A, 17-M60, 17-M61, 17-M62, 17-M63, and 17-M64, were distributed to members. These documents are further detailed in Annex A of these minutes.

Adoption of the Agenda

3. The revised agenda, CMD 17-M59.A, was adopted as presented. The order of meeting items presented in these minutes of Commission meeting may not reflect the chronology of the agenda.

Chair and Secretary

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

Minutes of the CNSC Meeting Held October 11-12, 2017

5. The minutes of the October 11-12, 2017 Commission meeting, CMD 17-M56, were approved.

Minutes of the CNSC Meeting Held November 9, 2017

6. The minutes of the November 9, 2017 Commission meeting, CMD 17-M60, were approved.

STATUS REPORTS

Status Report on Power Reactors

7. With reference to CMD 17-M61, which provides the Status Report on Power Reactors, CNSC staff reported updates on the following:

    - In regard to the Darlington NGS Unit 2 stand down, CNSC staff explained that the verification of health and safety requirements was an integral part of a CNSC site inspector's duties and that CNSC staff would undertake a

verification of the implementation of the joint venture safety work plan. CNSC staff also noted that, independent of this stand down, a Type II inspection on the topic of conventional health and safety had been scheduled for spring 2018 and that an Ontario Ministry of Labour (MOL) inspector would be invited to participate in that inspection.

- CNSC staff stated that the review by Fisheries and Oceans Canada (DFO) of the fish impingement event at the Pickering NGS is underway, and that they would provide an assessment of DFO's report on this matter when it becomes available.

- CNSC staff has started the detailed review process in regard to the fire resistant fluid leak at the Point Lepreau NGS.

- In regard to the event where a Bruce Power worker was seriously burned while performing turbine generator maintenance, originally presented to the Commission in an Event Initial Report (EIR) during the April 12, 2017 Commission meeting, CNSC staff requested closure of the action related to this matter by the Commission.[1] The Commission is satisfied with the information provided in regard to this matter and considers Regulatory Information Bank action #9560 closed.

Exercise Unified Control

8. CNSC staff presented information about the multi-organizational emergency Exercise Unified Control, which took place December 6 and 7, 2017 at the Pickering NGS. The exercise simulated a severe accident at the Pickering NGS Unit 1 and was designed to allow offsite response organizations to test their emergency management mechanisms and capabilities.

9. CNSC staff reported that CNSC inspectors and technical specialists were onsite to observe the response activities and assess compliance with CNSC requirements. CNSC staff also reported that CNSC staff's and the licensee's performance during the exercise would be documented, with lessons learned and recommendations for improvement presented to the Commission at a later date, as discussed in paragraph 11 below.

[1] *Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held on April 12, 2017*, paragraphs 12 – 16.

10. The Commission asked for further details about the mechanism used for the distribution of potassium iodide during the emergency exercise. The OPG representative explained that, in accordance with CNSC licensing requirements, OPG had pre-distributed potassium iodide to all households, residents and businesses within the primary zone with stockpiling of potassium iodide for distribution in the secondary zone.

11. In light of the emergency planning gaps identified in the *Annual Report* 2017 *of the Office of the Auditor General of Ontario*[2] (Annual Report 2017), the Commission asked about how this report would be considered in CNSC staff's review of the exercise. CNSC staff explained that Annual Report 2017 focussed primarily on actions that the province should consider as part of their emergency management preparedness strategies. Additionally, CNSC staff clarified that the scenario for Exercise Unified Control was developed prior to the release of the Annual Report 2017 and that the timing of the release of the report did not impact the conduct of the exercise. CNSC staff confirmed to the Commission's satisfaction that it would review Ontario's Annual Report 2017 and consider potential improvements to CNSC-regulated emergency management processes. CNSC staff also stated that consideration of the Annual Report 2017 would be included in CNSC staff's presentation to the Commission about the exercise at a later date. **ACTION** by August 2018

12. The OPG representative informed the Commission that the Annual Report 2017 also spoke to the province's status with respect to updating of the Provincial Nuclear Emergency Response Plan (PNERP). The OPG representative further stated that the PNERP had been approved by the Province of Ontario as of December 2017, and that OPG, as well as other licensees, had contributed to the updating of that plan. The Commission requested a presentation at a later date on the revised PNERP. **ACTION** by April 2018

Darlington Unit 2 Safety Stand Down

13. The Commission asked for further detail regarding the cause of the safety stand down that occurred at Darlington NGS Unit 2 on November 30, 2017. The OPG representative provided additional information about the safety stand down, explaining that it was a proactive response following two occurrences of non-adherence

[2] Office of the Auditor General of Ontario, *Annual Report 2017*, Chapter 3, http://www.auditor.on.ca/en/content/annualreports/arbyyear/ar2017.html, December 2017.

to safe work practices. The OPG representative emphasized that no significant accident or injuries had occurred as a result of the non-adherence to safe work practices.

14. The Commission asked for additional information on how common safety stand downs were at nuclear facilities. CNSC staff explained that safety stand downs regularly occurred at NGS, were proactive response measures to emerging safety trends and provided the example of a recent safety stand down, as well as a stand down exercise, at the Point Lepreau NGS. CNSC staff further explained why not all safety stand downs were reported to the Commission, noting that CNSC staff made risk-based decisions which considered event significance and the likelihood of its being reported to the public, as to whether or not to report a safety stand down to the Commission. CNSC staff further clarified why the stand down at the Darlington NGS was reported to the Commission.

15. The Commission was satisfied with the information provided on this matter, congratulated OPG on taking action to proactively maintain safe operations and encouraged the use of continued proactive safety measures such as stand downs.

Pickering NGS Fish Impingement

16. The Commission enquired about whether the type of fish impingement that occurred at the Pickering NGS was a common occurrence in the fall when diversion systems were removed before ice forms. The OPG representative clarified that this level of impingement was not normally associated with the removal of the diversion systems and stated that an investigation into this event was ongoing.

17. The Commission further enquired as to whether the impinged fish were primarily of a single species. The OPG representatives provided information about the species of fish that were impinged, confirming that the fish were primarily of a single species and were a young category of fish.

18. The Commission enquired as to the communications that OPG had with DFO in regard to this event, noting that the necessity of diversion system removal had been discussed previously and was not a new issue. The OPG representative responded that DFO had been notified and had asked OPG to provide it with a copy of its event report as well as additional information about the event once OPG's investigation was completed. CNSC staff added that OPG was in the process of preparing an application for an

authorization under subsection 35(1) of the *Fisheries Act*[3] (FA) from DFO and that this event would be considered by DFO in respect of this authorization. CNSC staff also confirmed that DFO would keep CNSC staff apprised on this investigation.

Point Lepreau NGS Fire Resistant Fluid Leak

19. The Commission asked for additional detail on the leak of fire resistant fluid at the Point Lepreau NGS, such as the size of the leak and method of cleanup. The New Brunswick Power (NB Power) representative indicated that the leak was significant, though not so significant as to cause a shutdown of the station and consisted of approximately 350 litres of fire resistant fluid (FRF). The NB Power representative further explained that FRF was a hydraulic fluid used in governor and intercept valves that controlled the flow of steam to the turbine and that it leaked onto several system components in the non-nuclear side of the station. In regard to the clean-up of the FRF, the NB Power representative stated that clean-up efforts recovered the majority of the fluid over the course of several weeks, using standard cleanup procedures and appropriate personal protective equipment.

20. The Commission further enquired about whether all of the spilled FRF was recovered or whether some could have flowed into the sump or other areas of the station. The NB Power representative explained that nearly all of the FRF was recovered but acknowledged that a small amount could have entered the sump. The NB Power representative added, that, given that the FRF was heavier than water, it would remain at the bottom of the sump, would not flow out to the treatment lagoons and that none of the FRF escaped to the environment. The Commission is satisfied with the information provided on this matter.

Update on Whole Site Probabilistic Safety Assessment (PSA)

21. With reference to CMD 17-M64.1, Ontario Power Generation (OPG) presented the Commission with an update on the whole-site probabilistic assessment (PSA) for Pickering NGS. The whole-site PSA update was a Commission request arising from the Pickering Hold Point Hearing in May 2014[4] where OPG committed to the completion of a pilot whole-site PSA by the end

[3] R.S.C., 1985, c. F-14.
[4] Canadian Nuclear Safety Commission, Record of Proceedings – *Ontario Power Generation Inc. – Application to Request Removal of a Hold Point for the Pickering Nuclear Generating Station*, May 7, 2014.

of 2017 for the Pickering Nuclear Generating Station (NGS). OPG presented a summary of the methodology used and the results of the whole-site PSA work that have been obtained to date.

22. With reference to CMD 17-M64, CNSC staff provided the Commission with a technical briefing about PSA, OPG's overall process for and results of the whole-site PSAs, including the methodology used by OPG to avoid the double counting of accident sequences. CNSC staff reported to the Commission that a more comprehensive assessment of the Pickering whole-site PSA was ongoing and that the complete results would be communicated as part of the annual Regulatory Oversight Report for Nuclear Power Plants in Canada.

23. Upon request from the Commission, the OPG representative explained the difference between the terms multi-unit PSA and whole-site PSA, including the complexities added to the modelling of whole-site PSAs. In this regard, the OPG representative provided the example of the assessment and modelling of the irradiated fuel bays which would not fall under the existing reactor PSA models, but would be performed under a whole-site PSA.

24. The Commission requested additional information about the severe core damage frequency (SCDF) and large release frequency (LRF) administrative safety goals and the safety goals that OPG is required to meet for different risks and the importance of meeting those goals. The OPG representative responded that the safety goals were considered on a single-unit and per-hazard basis, noting that the safety goals were based on international norms and consistent with current CNSC safety goal definitions. The OPG representative explained further that OPG was required to meet all PSA safety goals and that, through striving to achieve PSA safety goals, OPG implemented improvements at the individual reactor unit level. The OPG representative added that OPG was conservatively comparing the whole-site PSA results to single-unit safety goals and taking actions to further reduce risk. CNSC staff had determined that OPG's results showed that the Pickering NGS met all CNSC requirements with respect to PSA safety goals. CNSC staff added that, through an improvement implementation plan based on a periodic safety review currently underway at the Pickering NGS, OPG would further reduce residual risks at the site to aim to achieve PSA goals.

25. The Commission considered how acceptable risk and PSA safety was determined for the purposes of the protection of the public and the environment and requested additional information in this regard. The OPG representative explained how PSA goals were established through international consensus and stated that, through the public hearing and the licensing process, members of the public were able to provide their views on what they considered to be acceptable risks. CNSC staff added that previous experience had shown that the public expected continuous improvement in this regard.

26. In reference to the US quantitative health objectives for nuclear power plants, the Commission asked about the possibility of implementation of such health safety goals in Canada. The OPG representative responded that the LRF was considered as a surrogate to the US health objectives and that PSA safety goals were derived with consideration to those health objectives and that by virtue of meeting the goals of a Level 2 PSA, those health objectives were met. CNSC staff explained that LRF safety goals were developed with the intent of preventing the relocation of the population, thereby preventing both health effects from the release of radiation and societal effects from relocation.

27. In regard to severe events considered in PSAs, the Commission asked for more information about high-wind events and how these were considered in PSAs. The OPG representative acknowledged that high-wind events were very low-likelihood events but had significance from a risk perspective that had to be considered in PSAs. The OPG representative added that OPG produces public summary versions explaining the various hazards that were considered for each PSA major update. CNSC staff explained the different classes of wind, such as tornadoes, and wind speeds, and provided the Commission with information about how high winds recently had potential to affect NGS operations in the US. The Commission noted that high-wind events and their consideration in PSAs were not discussed as frequently as other hazards and suggested that this information could be provided in greater detail in future presentations.

28. The Commission noted that a PSA was only one of a suite of risk assessment tools and enquired about how these tools were integrated into modelling risk assessments. The OPG representative responded that PSAs were one of several tools within the risk and reliability program at OPG, and that there was no specified hierarchy to which tools were used. The OPG representative stated that OPG used deterministic and

probabilistic assessment, that these were used on a daily basis and provided information about how OPG's operations were guided by the most conservative of the two tools. CNSC staff informed the Commission that, in conducting CNSC reviews of plant designs, CNSC staff used deterministic safety assessments, followed by PSAs.

29. The Commission asked how the effectiveness of an emergency plan would be taken into account in a Level 3 PSA. CNSC staff responded that, although in principle it could be used in this way, due to the uncertainties of a Level 3 PSA, simpler methods of addressing that matter, such as dose assessment studies, could be used to assess the effectiveness of an emergency plan. The OPG representative informed the Commission that, by meeting the LRF safety goals, OPG was reducing the likelihood of having a severe accident and of implementing off-site protective measures.

30. The Commission asked for information about the lower power reactor operating modes and how they affected risk. The OPG representative provided detailed information about the risks in various operating modes, explaining that, for power levels between 100 percent full power mode and zero power hot mode – where a reactor operates at zero power with the heat transport system hot and pressurized – OPG bounded risk at 100 percent full power and considered it to be conservative to use the 100 percent full power mode for risk management.

31. Further on this topic, the Commission asked for additional information about risk calculation for multi-unit sites with reactors at different operating modes. The OPG representative explained that, for risk assessment, OPG always considered that one reactor is in a shutdown state and the other three reactors at high power. The OPG representative added that in that scenario, the risk was driven by the impact of an event on the three high power operating units and provided detailed information in this regard.

32. The Commission asked how upset reactor conditions, when pressure and temperature inside the reactor are above 100 percent, were considered during a risk assessment. The OPG representative explained that this scenario was captured in the analysis of a postulated event during a Level 2 PSA and provided an example of how a postulated loss of power regulation with an increase in power would be assessed.

33. The Commission asked for clarification regarding Level 1, 2 and 3 PSAs and how the frequency limits were determined based on the magnitude of the release. CNSC staff provided the Commission with detailed information about the uncertainties assessed in Level 1, 2 and 3 PSA and provided a detailed explanation on how release frequencies related to the release of different isotopes. CNSC staff added that setting limits on the frequency and on the magnitude of the release were effectively protecting the people and the environment.

34. The Commission noted the information provided by OPG regarding its methodology for estimating a whole-site LRF and requested additional information in this regard. The OPG representative provided detailed information on the methodology used for calculating a whole-site LRF and provided information about the challenges presented by such assessments.

35. For the calculation of PSA safety case, the Commission asked OPG to confirm that the risk of not being able to supply makeup water to the reactor core following a severe accident had been calculated. The OPG representative explained that this scenario had been considered in the PSA and informed the Commission that all the emergency mitigating equipment (EME) was included in the PSA, noting that the risk-benefit of EME depended on the hazard. The OPG representative also confirmed to the Commission that the potential of OPG not being able to deploy EME was part of the accident sequences considered in the PSAs.

36. The Commission congratulated OPG and CNSC staff for the presentations, noting that the presentations were very helpful in summarizing and explaining the complex subject of PSAs. The Commission provided CNSC staff with suggestions to clarify the data presented in the presentations such as presenting the safety goals and targets in a whole-site context and an explanation of what the considered wind events were and how they were considered.

INFORMATION ITEMS

Regulatory Oversight Report (ROR) for Uranium and Nuclear Substance Processing Facilities in Canada: 2016

37. With reference to CMD 17-M45, CNSC staff presented the annual Regulatory Oversight Report on the Uranium and Nuclear Substance Processing Facilities in Canada: 2016 (the UNSPF ROR). This report summarized the performance of all uranium

and nuclear substance processing facilities in all 14 safety and control areas (SCAs) assessed by the Canadian Nuclear Safety Commission (CNSC) during the 2016 calendar year. The highlights of the 2016 UNSPF ROR included:

- A focus on three SCAs: radiation protection, environmental protection and conventional health and safety, that reflected the overall effectiveness of licensee programs and facilities safety performance
- Descriptions of public information programs, significant facility modifications, reportable events, and areas of increased regulatory focus
- Confirmation that radiation protection, environmental protection, conventional health and safety, and other SCA programs were effectively implemented at uranium and nuclear substance processing facilities, protecting the public, workers, the environment, and ensuring compliance with Canada's international obligations
- Confirmation that the performance of all uranium and nuclear substance processing facilities in Canada was rated as "satisfactory" or better in all 14 SCAs for 2016

38. The public was invited to comment on the UNSPF ROR through written interventions. Four interventions were received. Through the CNSC's Participant Funding Program (PFP), participant funding in the amount of $32,055 was granted to three intervenors
    - Lake Ontario Waterkeeper
    - Northwatch
    - Algonquins of Ontario

Comments from Industry Representatives

39. The Commission invited industry representatives to provide the Commission with comments regarding the UNSPF ROR. The Cameco representative emphasized to the Commission that Cameco's priority was the safety and protection of its workers, the public and the environment. The Cameco representative stated that Cameco was proud to have a fully satisfactory rating in conventional health and safety at its Blind River Refinery facility and attributed this rating to the fact that it had been over ten years since that facility had experienced a lost time incident. The Cameco representative also addressed public engagement activities that Cameco had carried out in 2016 and expressed its commitment to continued safe operation of its facilities amid difficult market conditions.

40. With reference to CMD 17-M45.5, the BWXT Nuclear Energy Canada (BWXT) representative presented the Commission with an overview of BWXT's organization, including the licence transfer from GE-Hitachi Nuclear Energy Canada Incorporated to BWXT in December 2016[5]. The BWXT representative also provided details about BWXT radiation protection, environmental protection, emergency response and public information programs.

41. The SRB Technologies (Canada) Inc. (SRBT) representative stated that, despite having been granted satisfactory and fully satisfactory ratings in all 14 SCAs and maintaining emissions and doses to the public and to workers well below regulatory limits, SRBT was continuously seeking improvement to its programs and performance in SCAs. The SRBT representative also informed the Commission that some of the suggestions from intervenors, including Indigenous groups, submitted for this ROR would be incorporated into future compliance reports and activities.

42. The Nordion (Canada) Inc. (Nordion) representative delivered a brief overview of Nordion's main businesses and informed the Commission that, although the manufacturing of several isotopes had been discontinued, Nordion was developing a new source of molybdenum-99 which would be ready sometime in 2018. The Nordion representative also emphasized Nordion's commitment to the health and safety of its employees, the public and the environment, and stated that Nordion continuously sought ways to reduce its environmental impact.

43. The Best Theratronics representative stated that, since Best Theratronics worked exclusively with sealed sources, there were no environmental releases from its facility and that this was the reason why it did not have to carry out environmental monitoring for its facility. The Best Theratronics representative also confirmed its commitment to ensure compliance with its licence conditions, that there were no action limit exceedances at the facility during 2016 and that worker dose limits were well below regulatory limits.

Environmental Monitoring

44. The Commission requested information regarding effluent and

[5] Canadian Nuclear Safety Commission, Record of Decision – GE-Hitachi Nuclear Energy Canada Incorporated – *Application to Transfer and Amend Licence, Request to Accept Financial Guarantee*, December 9, 2016.

emission release limits as discussed in the UNSPF ROR. CNSC staff explained that the three levels applicable to liquid and airborne releases described in the CNSC's regulatory framework for releases to the environment included administrative levels, action levels and regulatory limits (also referred to as release limits), and provided the Commission with detailed information about these limits.

45. The Commission enquired about why limits for effluent release were more conservative than air-borne releases to the environment. CNSC staff stated that emission limits were set more conservatively because emissions to the air represented a direct exposure mechanism requiring a higher level of protection of the environment and persons in close proximity to the emission source. CNSC staff further explained that, since effluent first underwent treatment at a wastewater treatment plant prior to release into the environment, the limits for effluent could be set more conservatively than those for air emissions.

46. The Commission also noted that release limits and action levels were often set significantly higher than actual releases from CNSC-licensed facilities and requested additional information in this regard. CNSC staff stated that the CNSC was conducting a process to set concentration-based release limits for hazardous and nuclear substances. CNSC staff noted that licensees were currently working toward implementing N288.1, *Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities*,[6] to establish and document, during 2018, meaningful administrative and action levels.

47. The Commission requested additional information regarding uranium discharge limits specified in BWXT's operating licence and enquired about the potential accumulation of uranium from numerous facilities. CNSC staff explained that these limits were based on radiological dose limits to a member of the public of 50 µSv/year and noted that the multiple facilities in question were not releasing to the same sewer system, thus avoiding the cumulative impact.

48. The Commission sought clarification about how release limits could be defined as technology-based or exposure-based. CNSC staff explained that exposure-based limits were used to mitigate negative consequences that were directly related to the exposure

[6] N288.1, *Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities*, CSA Group, 2014.

to a hazardous or nuclear substance, whereas technology-based limits were based on assessments of specific technology to determine release limits that were achievable.

49. In considering the intervention from Swim Drink Fish Canada and the Lake Ontario Waterkeeper, the Commission enquired about how recreational and commercial activities in the waterways near Port Hope, ON had been impacted by their proximity to nuclear facilities. CNSC staff explained that results from licensee environmental monitoring and the CNSC Independent Environmental Monitoring Program (IEMP) demonstrated that radiological contaminant levels had not impacted the drinkability, fishability, or swimability of the water. CNSC staff also provided information about the project to clean up the Port Hope area, including the harbour, and explained that this cleanup mostly focused on deep sediments, that water in that area was swimmable, fishable and drinkable and that uranium concentrations in the harbour were well below the drinking water standard and below the levels designated to protect aquatic life.

50. The Commission noted the concerns expressed in the intervention from Swim Drink Fish Canada and the Lake Ontario Waterkeeper and requested additional information about the frequency of storm water monitoring and how this frequency compared to the specifications of CSA standards. CNSC staff explained that the intent of the CSA standards was to bring clarity and transparency to the establishment of appropriate frequencies for specific monitoring activities. CNSC staff also explained that this monitoring frequency also depended on the contaminants of concern identified in an environmental risk assessment (ERA) and whether discharges or flow rates were variable. The Cameco representative informed the Commission that, accompanying the new infrastructure improvements that were part of the Vision in Motion project, Cameco would be revising its storm water monitoring program, including the monitoring of all outlets, and reviewing the monitoring program’s compliance with applicable CSA standards.

51. The Commission requested additional information about how the environmental sampling intervals would be affected by the higher level of worker activity during the Vision in Motion project. CNSC staff explained that, before undertaking the reclamation activities, Cameco was required to submit its environmental monitoring program to the CNSC for approval. The Cameco representative further elaborated that Cameco had developed a supplementary environmental monitoring program specific to the

Vision in Motion project.

52. Further considering the intervention from Swim Drink Fish Canada and the Lake Ontario Waterkeeper, the Commission sought confirmation that all active sewer outlets were monitored. The Cameco representative responded that there were inherent limitations imposed in the current sewer system that limited when measurements could be obtained, provided examples of these limitations and explained how sampling was carried out taking these limitation into consideration. CNSC staff explained that sampling was also conducted at the point where all water flows from storm sewers merged and that, when combined with sampling of all water surrounding the facility, this provided an adequate environmental performance indicator.

53. Noting the close geographical proximity of the Nordion and Best Theratronics facilities in Ottawa, the Commission enquired about whether it was possible that the public received a combined dose from the two facilities that would be higher than dose limits for members of the public. CNSC staff explained that since there were no emissions or releases from the Best Theratronics facility, there was no dose to the public from that facility. However, CNSC staff further explained that the public dose was assessed on a per facility basis.

54. The Commission requested complementary details about frequency and depth of soil sampling around nuclear facilities. CNSC staff explained that soil sampling frequency was commensurate with the risk associated with a particular area and that soil sampling is performed at three different depths.

55. The Commission also enquired about whether the Ontario Ministry of the Environment and Climate Change (MOECC) conducted soil sampling at nuclear facilities. CNSC staff explained that MOECC did carry out soil sampling, but that it tends to be infrequent. CNSC staff also stated that environmental assessments always used all data available including results from CNSC IEMP, licensee data and results collected from MOECC.

56. The Commission requested CNSC staff's explanation about variability in the uranium concentrations in soil sampling observed between 2012 and 2016 at BWXT. CNSC staff explained that concentrations measured in a given area are not always related to the facility's emitted contributions, but rather a factor of historical contamination in the vicinity of a facility.

57. The Commission requested additional information about the action levels for the uranium urine bioassay. CNSC staff stated that action levels were typically set by licensees and were specific to operation, uranium compound, solubility and dosimetry.

58. The Commission further inquired about regulatory limits for uranium concentration from a toxicological perspective. CNSC staff reported that acute chemical toxicity was assessed based on the quantity of uranium per gram of kidney tissue and the corresponding concentration of uranium in urine (µg/L) and that this was accounted for through the monitoring of action limits at the facilities.

Regulatory Oversight

59. In reference to the intervention from the Canadian Nuclear Workers' Council, the Commission enquired about whether licensee staff who represented their unions engaged with CNSC inspectors. CNSC staff confirmed that licensee staff regularly engaged with CNSC inspectors.

60. Noting the higher person-days spent for licensing and compliance activities by CNSC staff at the PHCF than at other facilities during 2016, the Commission requested additional details. CNSC staff explained that the PHCF underwent relicensing in 2016, which required extensive person-days in respect of licensing activities. CNSC staff also explained that, in respect of compliance efforts, the PHCF was a complex site that required a higher amount of CNSC compliance verification activities.

61. The Commission requested details about CNSC desktop reviews and how they were used in CNSC compliance verification activities to evaluate a licensee's performance. CNSC staff explained that a desktop review was a comprehensive review of the annual licensee compliance reports, which detailed their performance in all 14 SCAs. CNSC staff further provided information about the frequency of desktop reviews, how they were conducted and noted that they may lead to additional inspections if required.

Public Information and Outreach

62. In considering the concern in the intervention from Northwatch about the public availability of CSA Group standards, the Commission noted that this was an issue that was previously

raised and requested additional information in this regard. CNSC staff explained that, although CSA Group standards were not generally freely and publically available, interested members of the public could register through the CNSC website to access and review all CSA standards that were part of the CNSC subscription. The Commission recognized that this was an extra service that CNSC was paying for to make access to these documents available to the public.

63. In considering the intervention from Northwatch, the Commission requested additional information to better understand the process of information dissemination by CNSC staff or the licensees in response to a request by the public. CNSC staff explained that licences, LCHs and licensee-submitted applications were generally released to members of the public upon request. CNSC staff also explained to the Commission that licensee documents, such as those in an LCH about licensee programs, were not CNSC documents. Therefore, CNSC staff added, it was not appropriate for the CNSC to disseminate these documents and that responsibility for their dissemination rested with the licensee.

64. Asked about the types of documents that would be considered to be proprietary, the Cameco representative responded that program level documents, such as preliminary decommissioning plans and cost estimates, included proprietary and confidential information and only summaries of these documents are posted for public review. The SRBT representative stated that all SRBT's documents, other than facility security program documents, may be requested by members of the public.

65. Noting the public awareness survey carried out by Northwatch as part of its intervention, the Commission requested additional information regarding public information and outreach near the Best Theratronics facility. The Best Theratronics representative responded that Best Theratronics would hold an open house in the spring and that its increased community outreach and communication would result in higher attendance than previous years. CNSC staff explained that licensees were expected to meet the specifications of RD/GD-99.3[7], *Public Information and Disclosure*, noting that licensee programs needed to be commensurate with the level of public interest and the facility's level of risk to the health and safety of the public and the environment. CNSC staff also confirmed to the Commission that

[7] CNSC Regulatory Document / Guidance Document RD/GD-99.3, *Public Information and Disclosure*, March 2012.

Best Theratronics' communication program was acceptable.

66. Noting that BWXT had put significant effort into improving its public information and disclosure program, the Commission requested additional information in this regard. The BWXT representative stated that considerable improvements had been made to BWXT's communications program and provided further details about their community engagement avenues, including its community liaison committees, newsletters and events.

67. Noting the recommendation from Northwatch that a section of the UNSPF ROR be dedicated to waste management, the Commission requested additional information in this regard. CNSC staff stated that all 14 SCAs were reported on in detail in the licensees' annual compliance reports, which were publically available. CNSC staff also explained that Canada was a signatory to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management[8] (JC) and submitted a triennial report for JC Review Meetings. CNSC staff further stated, for information, that this report was also presented to the Commission and that it covered the regulatory framework for waste management, waste disposal facilities, an overview of the type of licensee waste management programs, inventories of waste stored at each of the licensees facilities, as well as any waste disposal projects or facilities in Canada.

68. The Commission also requested information from CNSC staff about radionuclides and the National Pollutant Release Inventory (NPRI). CNSC staff provided information about the substances reported to the NPRI. CNSC staff also explained that Environment and Climate Change Canada did not include nuclear substances in the NPRI as the information was available on the CNSC website. CNSC staff confirmed to the Commission that work was being done to make this data more accessible and consistent with that seen in the NPRI.

Indigenous Engagement

69. Noting the recommendation from the Algonquins of Ontario to establish dose limits specific to Indigenous harvesters and land users, the Commission enquired about whether there were additional risks to Indigenous groups using the lands for traditional uses than for members of the public. CNSC staff confirmed to the Commission that the radiological dose limits

[8] International Atomic Energy Agency, *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*, INFCIRC/546, entered into force for Canada on 18 June 2001.

currently in place were protective of all members of the public, including Indigenous groups, and provided information about how these dose limits were established. CNSC staff also provided the Commission with information about how the IEMP sampling plan specifically took into account traditional land use by Indigenous groups near nuclear facilities.

70. The Commission requested additional information about the outreach and engagement activities and meetings between the Algonquins of Ontario (AOO), CNSC and SRBT in 2016. CNSC staff provided the Commission with information about summaries and lists about Indigenous engagement activities and meetings that are maintained. The SRBT representative also provided additional information about new opportunities that will be available in moving forward with the AOO.

71. The Commission stated that it would be useful for CNSC staff to compile a list of all meetings with Indigenous groups that have been, or are currently in the process of being, established for all licensees. CNSC staff noted that lists summarizing the groups and dates have been included in sections describing Indigenous engagement practices. CNSC staff also stated that a more complete list could be prepared by late spring to allow additional time to coordinate and finalize timelines with more communities.

General

72. The Commission requested additional information about Nordion's Environmental Monitoring Program (EMP) and the fully satisfactory rating it achieved in 2016, noting that a gap analysis for the implementation of updated standard had been undertaken at that time. CNSC staff explained that the fully satisfactory rating was a cumulative assessment based on a licensee's sustained and continued good to excellent performance in showing initiative to implement standards that are above and beyond CNSC expectations. In respect of the gap analysis that Nordion was conducting in 2016, CNSC staff provided additional details in this regard, noting that Nordion had submitted an acceptable implementation plan for updated environmental standards.

73. The Commission requested additional information about Best Theratronics' satisfactory rating in the waste management SCA in light of an order having been issued in 2015. CNSC staff provided additional details clarifying that the order in question was not related to Best Theratronics' waste management

practices, but to its financial guarantee.[9]

74. The Commission asked about whether BWXT manufactured fuel handling equipment for CANDU reactors. The BWXT representative stated that BWXT was the original equipment manufacturer for a number of fuel handling systems for Darlington and for Bruce NGS and that BWXT provided nuclear-related services to support the continued safe operation of those systems. The BWXT representative added that, due to the nature of the nuclear industry in Canada, BWXT was primarily involved in the lifecycle management of existing reactors.

75. The Commission requested more information about the International Atomic Energy Agency (IAEA) Fuel Incident Notification and Analysis System (FINAS). CNSC staff explained that FINAS was a web-based database set up by the IAEA for exchanging lessons learned and operating experience in fuel cycle facilities.

76. The Commission suggested that CNSC staff include an appendix in the ROR to provide a broader understanding of what had been considered in licensee desktop reviews. CNSC staff agreed, responding that this information could be helpful in providing details regarding the regulatory oversight work that goes into a ROR.

77. The Commission suggested that a short summary of the public outreach conducted by facilities should be included in the annual performance summaries of each licensee. CNSC staff agreed with this suggestion and noted that information on licensee public information and outreach programs would be expanded in future RORs.

78. The Commission complimented CNSC staff on the content of the UNSPF ROR and the presentation and indicated that it looked forward to seeing some of its recommendations implemented in the next UNSPF ROR.

Regulatory Oversight Report (ROR) for Uranium Mines and Mills in Canada: 2016

79. With reference to CMD 17-M47 and CMD 17-M47.A, CNSC staff presented the annual Regulatory Oversight Report for

[9] Canadian Nuclear Safety Commission, Order to Best Theratronics Ltd. Under Paragraph 37(2) of the Nuclear Safety and Control Act, August 25, 2015.

Uranium Mines and Mills in Canada: 2016 (UMM ROR). CNSC staff evaluated the performance of licensees with ratings in all 14 safety and control areas (SCAs), with a key focus on radiation protection, environmental protection and conventional health and safety. The ratings were derived from the results of ongoing CNSC regulatory oversight activities. All operating uranium mines and mills were rated as satisfactory in all SCAs. CNSC staff also presented information on historic and decommissioned sites where they were changes to performance ratings, notable events or licensing activities in 2016.

80. The public was invited to comment on the UMM ROR through written interventions. Seven interventions were received. Through the CNSC's Participant Funding Program (PFP), participant funding in the amount of $32,055 was granted to five intervenors:
    - Saskatchewan Environmental Society
    - Yà'thi Néné Lands and Resource Office
    - Birch Narrows Dene Nation
    - Buffalo River Dene Nation
    - Clarence Natomagan

81. Representatives from Cameco Corporation (Cameco) and AREVA Resources Canada Inc. (AREVA) provided the Commission with their general comments about CNSC staff's findings in the UMM ROR. The Cameco representative stated that Cameco's commitment to the health and safety of its workers and the public, the protection of the environment and the quality of Cameco's processes were demonstrated by the information provided in the UMM ROR. The Cameco representative also stated that, despite challenging market conditions that impacted production, Cameco continued to focus on its core activities and ensured continued engagement with members of the public to maintain public support for its mining programs. In this context, the Cameco representative stated that polling from 2016 showed 77 per cent of Northern Saskatchewan residents continued to support the uranium mining industry.

82. Commenting on the UMM ROR, the AREVA representative stated that the UMM ROR accurately summarized AREVA's performance at the McClean Lake operation. The AREVA representative also provided information about some of AREVA's milestone achievements in 2016, with an emphasis on the health and safety and protection of its employees, the public and the environment.

Aboriginal Engagement and Public Information

83. With reference to the intervention from the Saskatchewan Environmental Society, the Commission asked about the reason for not allowing a member of the public to accompany a CNSC inspector to the Cluff Lake site. CNSC staff answered that the initial offer to the member of the public was made informally and that, upon further assessment of the request, it was found that the safety risk of having a member of the public participating in a CNSC inspection in an unofficial capacity did not support formally extending the invitation. CNSC staff added that AREVA did invite the individual as a visitor to the Cluff Lake site and provided a tour to show the individual the areas about which he had expressed concern. The information about the tour was communicated to CNSC staff.

84. Noting the uranium mine and mill tours that were organized for delegates of the Canadian Nuclear Workers' Council 2015 conference, the Commission enquired about the logistics related to the organization of large tours to remote mine sites. The Cameco representative answered that Cameco had significant experience in hosting tours at the mine and mill sites, provided information about safety measures that were taken and noted that the limitation on the size of tour groups came primarily from the size of airplanes going to the mines.

85. The Commission further asked about site visit opportunities that were provided to local communities. The Cameco representative stated that the public was involved in environmental monitoring programs, including the Eastern Athabasca Regional Monitoring Program (EARMP), and that community members participated in the sampling process. The Cameco representative provided information to the Commission regarding additional programs which provided local communities with the opportunity to visit Cameco’s sites. The AREVA representative also stated that visitors can be accommodated at AREVA sites, such as when AREVA staff spent a day touring and discussing the Cluff Lake site with a member of the public who intervened in the 2015 UMM ROR.

86. With reference to the written submission from the Buffalo River Dene Nation and the Birch Narrows Dene Nation, the Commission asked for comments on the recommendations regarding CNSC staff’s efforts to collaborate with and report on the EARMP. CNSC staff provided details about its involvement in the EARMP and answered that, even though the EARMP and CNSC's Independent Environmental Monitoring Program (IEMP)

had slightly different goals, the CNSC IEMP webpage provided a link to other provincial and federal monitoring results related to nuclear substances, including the EARMP. The Cameco representative provided additional information on how the information from the EARMP was made known to the residents of the Athabasca region, including online publication and in-person communication by a CanNorth representative.

87. The Commission further asked at what frequency the EARMP report was updated. The Cameco representative answered that the community-based monitoring was carried out every year and that the results were reported annually. CNSC staff added that the funding for the production of the five-year EARMP report was recently put in place.

88. The Commission requested CNSC staff to provide information regarding its Aboriginal engagement efforts. CNSC staff presented a summary of the engagement activities performed and explained that, with respect to the Buffalo River Dene Nation and the Birch Narrows Dene Nation, CNSC staff was planning a meeting to discuss their concerns related to uranium mine and mill sites.

89. With reference to the written submission from the Yá'thi Néné Land and Resource Office, the Commission enquired about whether CNSC staff was in communication with the committees discussed in the intervention. The AREVA representative described the activities of the Athabasca Joint Environment and Engagement Subcommittee (AJES). The Cameco representative confirmed this. CNSC staff confirmed its engagement with the Yá'thi Néné and provided information regarding plans for future discussions with this intervenor.

90. The Commission asked whether Cameco and AREVA translated their communications material into Indigenous languages. The Cameco representative explained that translation services were provided in the Cree and Dene languages during Cameco's engagement efforts and that Cameco also translated the summary of key documents, such as Environmental Assessment, into Cree and Dene and posted them on its website. The AREVA representative confirmed that AREVA had a similar strategy and added that it could support the translation of other publications such as newsletters and magazine articles. CNSC staff added that the PFP allowed for participant funding to be used to hire a translator or to have documents translated.

91. In relation to the methods used to communicate with local communities, the Commission asked how licensees and CNSC staff ensured their communication and information sharing with the communities were optimized. CNSC staff responded that its communication process generally started by discussing with the communities how they would like to engage with the CNSC. CNSC staff added that the CNSC provided opportunities to ensure CNSC staff was educated in all aspects regarding Indigenous relations. CNSC staff further added that CNSC staff saw the environmental quality committee created with indigenous groups in Northern Saskatchewan as a model worth to be implemented in other regions.

92. Further on the topic of communications with Indigenous communities, the Saskatchewan Ministry of Environment - Uranium and Northern Operations representative provided information about the Indigenous engagement activities carried out by the Northern Mines Monitoring Secretariat. The Saskatchewan Ministry of Health and Northern Population Health Unit representative explained how the environmental quality committees operated, emphasized the importance of relationships with local Indigenous groups and indicated that a magazine providing information on various industry activities, from exploration to decommissioning, was distributed to homes across Northern Saskatchewan.

93. With reference to the intervention from Northwatch, the Commission asked for comment on the intervenor's recommendation to make the RORs more available and to develop an overall matrix indicating which topics were addressed by which ROR. CNSC staff responded that the RORs were available to the public and for public comment, noting that between the 2015 and 2016 RORs there had been changes in the information presented. CNSC staff added that the ROR schedule would be more predictable in the years to come.

Environmental Protection and Monitoring

94. The Commission asked about the Saskatchewan Environmental Society's submissions regarding country food samples that were above screening levels near McClean Lake. The AREVA representative explained that the intervenor was referring to results that were published as part of the CNSC staff's IEMP. The AREVA representative added that these issues were found both at exposure and reference lakes and therefore should not be perceived as elevated downstream results. CNSC staff confirmed the information provided by the AREVA representative.

95. The Commission enquired about how harvesting of foodstuffs close to mine sites was managed in order to prevent risk to public health. CNSC staff explained that monitoring results had shown that uranium mining was not having an impact that was different from the natural environment and that, therefore, there was no need to control or advise local communities about limiting consumption of locally harvested foodstuffs.

96. The Commission noted the concerns regarding abnormalities in fish and concentrations of polonium and radium in moose reported in Ms. Drummond and Mr. Gardiner's intervention and requested additional information on these issues. The AREVA representative stated that AREVA's interpretation of the moose and fish sampling results was that game downstream of Cluff Lake was safe to consume. The Saskatchewan Ministry of Health and Northern Population Health Unit representative provided information about the health physics document that was referenced by the intervenor, noting that the results of the intervenor's moose sample were aligned with the general range of contaminants that were found in moose within some parts of Saskatchewan, away from uranium mines, as well as those seen in beef found at the grocery store.

97. Further on the topic of the results of the moose sample, the Commission enquired about publishing the results of the moose analysis. The AREVA representative stated that it would be useful to have these results published in a peer-reviewed paper.

98. Addressing the Saskatchewan Environmental Society's suggestion to add the calculation of greenhouse gas emissions from uranium mines in the ROR, CNSC staff informed the Commission that uranium mines and mills were well below the federal reporting threshold of 50,000 tons of carbon dioxide per year. The Commission expressed the opinion that it would be useful for future RORs to mention that information.

99. The Commission asked for clarification about a statement in the UMM ROR regarding the remote locations of the decommissioned and historic sites. CNSC staff explained that the sentence portrayed a physical characteristic of the area and confirmed to the Commission that the CNSC provided the same level of environmental protection and enforcement at a site, regardless of location or population density.

100. Noting the comment in Ms. Drummond and Mr. Gardiner's intervention regarding "a recent large die-off of fish" at Cluff Lake, the Commission requested additional information in this regard.[10] CNSC staff explained that this event happened more than a decade ago when the end of operations at Cluff Lake affected the amount of oxygenation in the water, noting that this was predicted at the decommissioning stage. CNSC staff stated to the Commission's satisfaction that the reason for this die-off of fish was not due to any contaminants at or near the Cluff Lake site. The AREVA representative confirmed that AREVA's sampling had shown that fish and game downstream of Cluff Lake did not exhibit any significant levels of contamination.

101. In its intervention, Northwatch questioned CNSC staff's description of the decommissioned sites as static and the Commission asked if the potential of a large release of 'trapped' contamination such as long-lived radioisotopes in the hydrogeological system was taken into account in the modeling. CNSC staff answered that hydrogeological models and movement considered these peak concentrations, showing that the contaminant concentrations were not expected to come out at a greater concentration than what was currently being modelled.

102. The Commission noted that, in its intervention, Northwatch had used the word "worsening" in regard to the state of historic and decommissioned uranium mines and mills and questioned CNSC staff's description of these sites as 'static.' CNSC staff answered that the concentrations of contaminants might fluctuate over time but that the fluctuations were minor and the concentrations remained below regulatory limits. CNSC staff added that, in the case of Elliot Lake, although the radium concentrations were found to be increasing, the concentrations were lower than the regulatory limit. CNSC staff also added that Rio Algom reported monthly to the CNSC. The Rio Algom representative explained the physical work that had been performed on-site to reverse this particular trend.

103. With reference to an intervention from Mr. Clarence Natomagan, the Commission requested information regarding the absence of provincial or federal limits on molybdenum in the effluents. CNSC staff explained the concerns with molybdenum, the reasons for not having a limit set nationally and the ongoing discussions with Environment and Climate Change Canada in this regard. The Cameco representative emphasized the changes

[10] After the closure of the Commission meeting, the Commission noted an article on this subject, *Cluff Lake Decommissioning: Is it complete*, in the January-February 2018 edition of Opportunity North Magazine.

made to mine and mill infrastructure in order to reduce the level of molybdenum in the treated effluents.

104. Asked about the anhydrous ammonia release issues at McClean Lake, the AREVA representative explained to the Commission what was done in collaboration with the anhydrous ammonia vendor and delivery company to eliminate the anhydrous ammonia offloading leaks at McClean Lake. The Cameco representative presented the modifications that were made at Cigar Lake in order to stop the anhydrous ammonia leaks at the freeze plant. The Cameco representative added that the interior work spaces which could be affected by anhydrous ammonia leaks were continuously vented and also set up with an alarm system. CNSC staff commented that the new systems put in place have been determined to have improved the situation and that the next step may involve assessment by CNSC's human factors specialists.

105. The Commission asked CNSC staff to provide an explanation of the use of provincial or federal standards for environmental protection matters. CNSC staff explained that some areas were directly under provincial jurisdiction, whereas some standards were under federal jurisdiction, and provided examples of such situations.

106. Concerning the water treatment being carried out at Elliot Lake, the Commission asked about the intention to have the water treatment continue on this site for the next 200 years as noted in the UMM ROR. CNSC staff answered that the current estimate was that water treatment would continue in perpetuity. However, as technologies continued to change, Rio Algom's goal was to eventually try to move to some passive treatment system in order to keep the releases below licence limits. The Rio Algom representative added that current research had shown promise in this regard and that a decision to move to a passive water treatment system could be made in the next ten years.

107. The Commission asked for clarification about some figures representing sediment profiles in the UMM ROR. CNSC staff described the figures and explained that analysis of the sediments provided a chronology of the concentration of contaminants present in the sediments.

108. The Commission asked what a benthic organism was and how deep in the sediment they lived. CNSC staff explained that benthic organisms are any insects or organisms that live in the

mud at the bottom of a lake. CNSC staff added that benthic organisms will usually live in the top two centimetres.

109. The Commission asked about the changes to the benthic organisms' richness observed over time presented in the UMM ROR. CNSC staff explained that the richness was the diversity of the benthic species that were present in sediments. CNSC staff added that sedimentation was slower in larger lakes in comparison to smaller lakes and that therefore the recovery of benthic organisms was also slower in larger lakes.

110. The Commission noted the large number of regulatory levels and limits referred to in the UMM ROR and recommended clarifications from CNSC staff. The Commission further recommended that CNSC staff clarify the difference between an effluent limit and drinking water limits used in the UMM ROR.

Radiation Protection

111. Upon request from the Commission during its consideration of the intervention from the Saskatchewan Environmental Society, CNSC staff presented an overview of what ALARA means and its role in radiation safety.

112. Further on the topic of ALARA, the Commission asked CNSC staff to explain how one determines what is reasonable and achievable and what is safe enough. CNSC staff answered that reasonableness was considered in regard to the context of the situations. CNSC staff added that CNSC staff also evaluated whether a licensee could demonstrate it had undertaken all protective measures that can be made within the confines of the economic implications that may be present.

113. The Commission invited CNSC staff to clarify the definition of a Nuclear Energy Worker (NEW). CNSC staff explained which workers were considered NEWs and how licensee programs ensured that the doses to those individuals were below the dose limits.

114. The Commission asked CNSC staff for an example of how the different radiation protection administrative levels discussed in the UMM ROR would be used. CNSC staff explained the different dose limits and the different administrative levels. CNSC staff also provided information on how the different levels are linked with the continuous working level monitors for radon progeny.

115. Commenting on the radon reference level used in the UMM ROR, the Commission suggested that CNSC staff review the recently updated models and radon reference levels from the International Commission on Radiological Protection (ICRP).

116. On the issue raised by the Saskatchewan Environmental Society about the use of the Linear Non-Threshold model (LNT) for estimating cancer rates, CNSC staff explained to the Commission that the ICRP and the United Nations Scientific Committee on the Effects of Atomic Radiation were very clear that it was not appropriate to use collective dose or the LNT model to predict the number of deaths as a result of cancer.

Financial Guarantees

117. The Commission asked about the funding that would eventually be required to transfer Beaverlodge properties into Saskatchewan's Institutional Control Program (ICP). The Saskatchewan Ministry of Economy representative explained that funds for the long-term monitoring and maintenance of those sites, as well as for unforeseen events, would have to be transferred to the Ministry before the properties could be transferred to the ICP. CNSC staff added that the transfer of Beaverlodge properties was progressing according to plan and that the responsibility of monitoring the properties would be transferred to another competent authority, Saskatchewan, once the sites were ready and the Commission had made the decision to release them to ICP.

118. In relation to the cost of decommissioning Cluff Lake and the financial guarantee amounts, the AREVA representative presented to the Commission the original decommissioning cost predictions and compared them favorably to what AREVA actually spent to complete the decommissioning of Cluff Lake. The AREVA representative added that the same methodology was recently used to estimate the cost of decommissioning for McClean Lake.

119. The Commission asked CNSC staff to elaborate on the CNSC process used to evaluate financial guarantees. CNSC staff presented the financial guarantee process starting with the decommissioning plans to calculate a valid cost estimate. CNSC staff added that CNSC subject matter experts reviewed all of the decommissioning plans for all CNSC regulated facilities. CNSC staff also provided information about CNSC Regulatory Guide

G-219[11] and CSA standard N294, Decommissioning of facilities containing nuclear substances[12] used for the reviews. CNSC staff also mentioned CNSC's collaboration with international groups and agencies.

120. In response to a Commission enquiry, CNSC staff responded that there is no requirement on the licensees to use a third party to do the cost estimate for the financial guarantee. CNSC staff added that the financial guarantee should be revised, at a minimum, every five years or when there were changes in the cost estimate requiring a change to the financial guarantee. The Saskatchewan Ministry of Environment representative added that the Ministry of Environment performed their own review of the cost estimates without the intervention of a third party.

General

121. The Commission asked for information about CNSC staff's reporting on historical and decommissioned mines and mills to the Commission through RORs. CNSC staff answered that, although CNSC staff was not reporting on all of the sites on an annual basis, CNSC staff will report to the Commission should there be poor performance at a licensee site.

122. The Commission asked for clarification on the number of mines in each mining sector that were found to be out of compliance with at least one *Metal Mining Effluent Regulations*[13] parameter as presented in the staff's presentation. CNSC staff explained that the number of non-compliances in the table was calculated in months over the period of a year making it possible to have the number of non-compliance higher that the number of mines. The Commission requested that CNSC staff change the title of the individual elements for greater clarity.

123. The Commission requested additional information regarding the production flexibility that allowed mines to carry over uranium production shortfalls into the following year. CNSC staff answered that the mines had flexibility, but that it was still within a set of limits. The Cameco representative gave the example of the production limits at Cigar Lake to illustrate the point.

124. Recalling the Mount Polley dam break event at a non-uranium mine in 2014, the Commission asked about the frequency of dam

[11] CNSC Regulatory Guide G-219, *Decommissioning Planning for Licensed Activities*, 2000.
[12] N294, *Decommissioning of facilities containing nuclear substances*, CSA Group, 2009 (reaffirmed 2014).
[13] SOR/2002-222

inspections at mine sites. CNSC staff responded that dam safety reviews were conducted every seven years according to dam safety guidelines but noted that licensees also had a geotechnical inspection program in place which included quarterly routine inspections of all dams, dikes and appurtenant structures by the licensee staff, as well as an annual inspection and a performance review by a third-party engineer. The Cameco representative provided the Commission with additional information regarding safety at tailings dams at Cameco facilities. The AREVA representative stated that AREVA had similar programs as Cameco and provided details in this regard.

125. The Commission asked for closing comments from Cameco and AREVA. The Cameco representative shared Cameco's concerns about the increasing size of the UMM ROR and the corresponding effort needed to prepare for the meeting. The AREVA representative shared similar concerns with the Commission and noted AREVA's appreciation for being able to provide feedback.

126. The Commission complimented CNSC staff on the content of the ROR and the presentation and indicated that it looked forward to seeing some of its recommendations implemented in the next UMM ROR.

Canada's participation at the 7th Review Meeting of the Convention on Nuclear Safety

127. With reference to CMD 17-M51, CNSC staff presented the Commission with a report on Canada's participation in the 7th Review Meeting (7th RM) of the Convention on Nuclear Safety (CNS).

Comments from Industry and Government Representatives

128. The Commission invited industry and government representatives who attended the 7th RM as part of Canada's delegation to provide their perspectives as attendees and how their participation would contribute to nuclear safety in Canada.

129. The Bruce Power representative commented that the 7th RM was an interesting forum which had provided Bruce Power a good opportunity to interact with representatives and regulatory staff from other countries, with focus on good practices and safety improvements in the nuclear industry. The Bruce Power representative also noted that significant efforts were made at this

RM, as well as at the 6th RM, to ensure that discussions prioritized nuclear safety rather than political issues.

130. The Ontario Power Generation Inc. (OPG) representative stated that attending the 7th RM was a great opportunity to liaise with international nuclear industry representatives and to learn what other Contracting Parties to the CNS were doing in terms of improving nuclear safety in their countries. The OPG representative also noted that some Contracting Parties still had some work to do in order to catch up with the nuclear safety standards implemented elsewhere and emphasized the importance of the sharing of operational experience across the nuclear industry.

131. The Health Canada (HC) representative stated that HC's inclusion in Canada's delegation to the 7th RM was a good opportunity to hear the experience of other countries and to share HC's expertise with other Contracting Parties. The HC representative also stated that being a part of Canada's delegation provided a good opportunity for HC to engage with all members representing the Canadian nuclear community.

132. The Candu Energy representative stated that attending the 7th RM was a good opportunity, particularly as a representative of reactor designers, to observe how similar regulatory requirements can result in different regulatory outcomes internationally. The Candu Energy representative also noted that the CNSC often facilitated the interpretation and understanding of international nuclear regulatory norms for less experienced regulators to ensure the highest level of safety in reactor design.

General Questions from the Commission

133. Concerning the pressure tube accident that occurred in India, the Commission enquired about lessons learned resulting from the accident. CNSC staff replied that, although all information about international nuclear events was important to review, this accident was of particular interest to the CNSC because of the design similarities between the Indian nuclear reactor and the CANDU reactors. CNSC staff explained that, even though the root cause in this case was found to not be a concern in respect to the operation of Canada's reactors, lessons could be learned from this accident as India's investigation continued, particularly about the manufacturing of nuclear reactor components. CNSC staff emphasized the importance of the peer review provided by the 7th

RM attendees in this regard, which encouraged the Indian delegation to provide as much information about the accident as possible.

134. The Commission noted the reactor refurbishment activities that Canada was carrying out and requested additional information about other international reactor refurbishment projects. CNSC staff stated that CANDU reactors were unique because major components such as pressure tubes could be replaced. CNSC staff provided information about other CANDU countries currently conducting or planning reactor refurbishments. CNSC staff also explained that many non-CANDU countries with older NPPs were investigating long-term operation and aging management strategies and provided additional details on the challenges facing lifecycle extensions. The Bruce Power representative provided additional details about the uniqueness of the CANDU technology regarding refurbishment and how these compared to life extension projects for other reactor designs.

135. Further, on the topic of life extension and aging management for NPPs, R. Jammal, Executive Vice-President and Chief Regulatory Operations Officer, informed the Commission that, in his capacity as President of the 7th RM, one of his recommendations for Contracting Parties to report on for the 8th RM was managing the safety of aging facilities and NPP life extension, noting that it was one of the primary stresses facing global nuclear safety. R. Jammal also submitted that the full President's Report from the CNS would be provided to Commission Members for information following this public meeting.[14]

136. Concerning the recent audit from the Office of the Auditor General of Ontario on emergency planning in Ontario,[15] the Commission invited HC to provide information about how the weaknesses identified in Ontario's Provincial Nuclear Emergency Response Plan (PNERP) affected the Federal Nuclear Emergency Plan (FNEP). The HC representative explained that the provinces were expected to take a lead role in their provincial emergency preparedness and response plans, including off-site nuclear emergency management and stated that the Province of Ontario's

[14] All current Commission Members were provided with the *Report of the President of the Review Meeting* for the 7th Review meeting of the Contracting Parties to the Convention on Nuclear Safety.
[15] Office of the Auditor General of Ontario, *2017 Annual Report*, Chapter 3, *Emergency Management in Ontario*, http://www.auditor.on.ca/en/content/news/news.html, 2017.

revised PNERP, when it became available, would be included in the FNEP, noting that HC had contributed to the revisions of Ontario's PNERP.

137. The HC representative confirmed that HC took its responsibilities in respect of the FNEP very seriously and provided additional information about HC's work with the provinces on provincial nuclear emergency plans.

138. The Commission congratulated CNSC staff for their work and leadership representing Canada at the 7th RM, as well as Mr. R. Jammal for his successful tenure as the President of the 7th RM.

DECISION ITEMS ON REGULATORY DOCUMENTS

Regulatory Document REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*

139. With reference to CMD 17-M62, CMD 17-M62.A and CMD 17-M62.B, CNSC staff presented to the Commission CNSC Regulatory Document REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*, for consideration. This document will supersede *Accounting and Reporting of Nuclear Material* (RD 336) and *Guidance for Accounting and Reporting of Nuclear Material* (GD 336). It sets out requirements and guidance of the CNSC with respect to safeguards programs for relevant licensees and applicants by codifying existing safeguards and nuclear material accountancy practices introducing requirements based on type of material, facility and activity; and providing a comprehensive resource for safeguards and nuclear material accountancy related requirements and guidance.

140. The Commission enquired about the types of materials possessed by health authorities and other similar organizations regulated by the Directorate of Nuclear Substance Regulation (DNSR) that would be covered by the safeguards regulatory framework. CNSC staff explained that these licensees were required to take measures to facilitate Canada's compliance with its safeguards agreements pursuant to paragraph 12(1)(i) of the *General Nuclear Safety and Control Regulations*[16] (GNSCR), and that some licensees had additional conditions in their licences. CNSC

[16] SOR/2000-202.

staff also explained that many DNSR-regulated licensees worked with depleted uranium shielding in devices, such as radiography cameras, and that these materials were covered under safeguards agreements.

141. The Commission further enquired whether the affected DNSR-regulated licensees were included in consultation for this proposed REGDOC. CNSC staff explained that all DNSR-regulated licensees were notified through DNSR's subscription service in regard to consultation opportunities for this proposed REGDOC. CNSC staff also explained that the proposed REGDOC-2.13.1 contained no substantive changes in regard to licensees' current safeguards obligations.

142. The Commission requested additional information about Annex A, Licensees with Safeguards Conditions of CMD 17-M62. CNSC staff explained that the licensees listed in Annex A of CMD 17-M62 were licensees that had specific safeguards-related licence conditions due to their possession of safeguarded nuclear materials, in addition to regulatory requirements in the GNSCR. CNSC staff also submitted that the Saskatchewan Research Council, which was licensed to operate a SLOWPOKE-2 reactor, was omitted from this list by error.

143. The Commission asked whether decommissioned uranium mines that would eventually be transferred into an institutional control program would still have to be declared to the International Atomic Energy Agency (IAEA) under Canada's safeguards agreements. CNSC staff explained that, under the Additional Protocol[17] to its safeguards agreement with the IAEA, all operational and decommissioned uranium mines had to be declared to the IAEA every year and, as such, these sites and licensees were included in Annex A of CMD 17-M62. The Commission further enquired if this was an obligation that would continue in perpetuity. CNSC staff explained that, under the current safeguards agreements, these were obligations that had to be met in perpetuity and provided information about why such controls on low-risk facilities were put in place.

144. The Commission requested details about how often the IAEA inspected licensee sites and if these findings were made publicly available. CNSC staff explained that the number of times the IAEA sought complementary access under the Additional

[17] International Atomic Energy Agency – *Protocol Additional to the Agreement between Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*, INFCIRC/164/Add.1, entered into force: 8 September 2000.

Protocol varied from year to year and was typically infrequent, whereas safeguards inspection frequency depended on the nature of the nuclear facility and its location. CNSC staff informed the Commission that the IAEA treated all safeguards information as safeguards confidential and therefore it was not publicly available; however, the IAEA provided inspection result reports to the CNSC and the licensee of the inspected facility. CNSC staff further noted that the public could get information regarding the IAEA's inspections through the annual Safeguards Implementation Report; notably, the inspections findings summaries.

145. The Commission enquired if all of the licensees listed in Annex A were required to submit an annual safeguards report. CNSC staff explained that any licensee with nuclear material was obligated to submit their inventory and inventory change documents to the CNSC. CNSC staff also explained that exempted nuclear materials needed to be reported only if the licensee intended to move or process those materials. CNSC staff noted, however, that, for practicality, all of a licensee's inventory of safeguarded nuclear materials, including exempted nuclear materials, was reported annually and that this reporting was part of licensee conditions against which compliance was verified annually.

146. Noting the concerns from industry in respect of the proposed REGDOC that were raised during the CNSC's public consultation activities, the Commission requested comments from CNSC staff about its view on the effectiveness of the process. CNSC staff provided the Commission with details about the acceptable machine readable document formats, the Nuclear Materials Accountancy Reporting (NMAR) e-Business Suite and the plans to assist both large and small licensees with the implementation of the new systems and templates. CNSC staff also provided the Commission with information about the outreach activities that it had carried out with licensees in regard to the proposed REGDOC. The Commission expressed satisfaction that the nuclear material reporting was moving towards being a paperless process.

147. Further on the topic of consultation, the Commission invited industry representatives to comment on the proposed REGDOC-2.13.1 and the changes to the reporting systems.

148. The CNL representative informed the Commission that CNL believed that it had been adequately consulted during the process

and was already in compliance with the proposed REGDOC, having already worked closely with staff to resolve software-related issues. CNL provided the Commission with additional details about the IAEA inspection frequency, noting that the inspections focused primarily on the Chalk River Laboratory site due to the nature of CNL's facilities and licenced activities.

149. The OPG representative informed the Commission that OPG's NMAR e-Business Suite implementation plan had recently been submitted to CNSC staff. OPG also noted to the Commission that due to incompatible technology, it would take time to implement NMAR e-Business Suite on the relevant systems.

150. The Commission asked for more information about the scope of the proposed REGDOC-2.13.1, and the relevance of providing operational and design information to the IAEA. CNSC staff explained that operational and design information was within the scope of the safeguards information that must be provided to the IAEA, as this was necessary information for the IAEA to plan and support its inspection and verification activities.

151. The Commission enquired about how CNSC staff carried out the verifications for the declarable nuclear-related manufacturing activities defined in Appendix A of the proposed REGDOC-2.13.1, noting that these activities were not necessarily carried out by CNSC licensees. CNSC staff agreed that not all participants who are engaged in these activities were licensees and that the onus was on the CNSC to keep abreast of these activities and inform these participants of their reporting obligations under the safeguards agreements. CNSC staff further explained that any Canadian entity wanting to import or export technologies related to these declarable nuclear-related manufacturing activities were subject to CNSC licensing under the *Nuclear Non-proliferation Import and Export Control Regulations*[18].

Decision on REGDOC-2.13.1 **DECISION**

152. After considering the recommendations submitted by CNSC staff, the Commission approves regulatory document REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy* for publication and use.

[18]SOR/2000-210.

Regulatory Document REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*

153. With reference to CMD 17-M63, CNSC staff presented to the Commission REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*, for consideration and approval. This document sets out requirements and guidance for reports and notifications that licensees of Class I nuclear facilities (excluding power reactors) and of uranium mines and mills must submit to the CNSC. The implementation of REGDOC-3.1.2, Volume I is expected to lead to greater regulatory certainty for licensees of the identified facilities, increased consistency in meeting reporting requirements, and transparency for the Canadian public and international community on the CNSC's regulatory requirements and guidance.

154. The Commission asked for clarification of the date by which licensees would be expected to comply with the proposed REGDOC if made by the Commission, and on the process for its implementation. CNSC staff explained that the usual process followed for the implementation of regulatory documents, if approved by the Commission, included sending letters to licensees to begin the process of developing implementation plans. CNSC staff also explained that, following the development of the implementation plans, a REGDOC would be added to the relevant Licence Condition Handbooks. CNSC staff further informed the Commission that the majority of licensees were already in compliance with the specifications of REGDOC-3.1.2, Volume I.

155. The Commission noted that REGDOC-3.1.2, Volume I intended to consolidate the reporting requirements from four documents and requested additional details in this regard. CNSC staff explained that Appendix A of the proposed REGDOC was a reference table that brought together reporting requirements that were found in Licence Condition Handbooks, licence conditions, and regulations made under the NSCA. The Commission was satisfied with the information provided in regard to the well-thought out consolidation of reporting requirements in Appendix A of the proposed REGDOC.

156. The Commission asked for additional details regarding immediate reporting requirements and requested details on how those in the proposed REGDOC compared to those in REGDOC-

3.1.1, *Reporting Requirements for Nuclear Power Plants*.[19] CNSC staff provided additional information about reporting timelines and clarified that reporting timelines for specific events were specified in section 29 of the *General Nuclear Safety and Control Regulations*, unless a licence established different timelines. CNSC staff further explained that, for nuclear power plants, a longer time period for initial reporting for certain non-significant events was established in licences given the more complex analysis that is required for nuclear power plant operations. CNSC staff also provided the Commission with detailed examples about the processes used for immediate reporting at nuclear power plants (NPPs) and the reasons for which immediate reporting requirements for NPPs differed from those for Class I facilities considered in this REGDOC.

157. The Commission asked for more information regarding reporting requirements of other federal or provincial authorities in regard to the release of hazardous substances and enquired about how much variation existed between different provinces. CNSC staff responded that reporting requirements for the release of hazardous substances were specified in section 29 of the GNSCR and provided additional information regarding the level of variation of provincial requirements. CNSC staff also stated that, although some reporting requirements were specific to provincial jurisdictions, the CNSC regulatory framework ensured that those reports were made to the CNSC as well. CNSC staff also explained that, although attempts to harmonize reporting requirements had been made, some differences still existed and provided details in this regard.

158. The Commission requested additional information regarding the interpretation of the word "immediate" in the context of certain reporting requirements that required immediate reporting to the CNSC. CNSC staff explained that, since "immediately" was not defined in CNSC regulations – specifically the GNSCR and the *Packaging and Transport of Nuclear Substances Regulations, 2015*[20] – the proposed REGDOC provided guidance to licensees in this regard with a definition of "immediately" as meaning "as soon as a licensee becomes aware that a situation or event is reportable (…); that is, after the licensee has taken steps to mitigate the consequences (as applicable)."

[19] CNSC Regulatory Document REGDOC-3.1.1, *Reporting Requirements for Nuclear Power Plants*, Version 2, April 2016.
[20] SOR/2015-145.

159. The Commission requested clarification regarding the guidance in the proposed REGDOC for reporting requirements in the event of serious illness, injury or death. The OPG representative explained that, in the case of REGDOC-3.1.1, which addressed reporting requirements for nuclear power plants, an interpretation document had been developed to document such situations, and that the CANDU Owner's Group and CNSC staff met regularly to ensure consistency and appropriate interpretation to meet regulatory requirements in this regard. The Commission noted that it would be infeasible to remove the element of judgement from the interpretation of such reporting requirements and opined that the CNSC should maintain some flexibility in this regard. CNSC staff confirmed to the Commission that this was the approach taken by the CNSC and added that an event with increased stakeholder interest could result in it being a reportable event even when it otherwise may not have been considered to be reportable and provided several examples of cases where this had occurred at uranium mine and mill sites.

160. The Commission enquired about the number of non-compliances found or Administrative Monetary Penalties (AMPs) issued to licensees in respect of reporting requirements. CNSC staff provided the Commission with information in this regard, indicating that, to date, no AMPs had been issued to licensees in relation to reporting requirement non-compliances. However, CNSC staff noted that there had been events for which it was unclear as to whether they were reportable, and that the proposed REGDOC intended to improve clarity in this regard. CNSC staff added that the recent effort to encourage licensees to report to the CNSC through the duty officer had yielded positive results as it ensured that information regarding reported events was widely distributed.

Decision on REGDOC-3.1.2, Volume I **DECISION**

161. After considering the recommendations submitted by CNSC staff, the Commission approves regulatory document REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills* for publication and use.

162. The Commission provided several recommendations and comments to CNSC staff to be implemented at their discretion regarding the clarity and layout of the proposed REGDOC-3.1.2, Volume I, including
    - The Commission recommended adding a list of the Class IB facilities captured in this REGDOC as an appendix.

- The Commission recommended further explaining nomenclature and acronyms used in the REGDOC to improve its clarity.
- The Commission noted that, while Table A in the proposed REGDOC could appear to represent a long list of reporting requirements, it had value when viewed as a helpful reference table rather than a prescriptive list of requirements.
- The Commission noted the benefits of not requiring an evaluation of the safety significance of an event before reporting it to the Commission, in order to incentivize licensees to bring information to the Commission immediately and to determine safety significance afterward.

Closure of the Public Meeting

- The public meeting closed at 17:49, December 14, 2017.

Recording Secretary	March 19, 2018 Date
Recording Secretary	March 19, 2018 Date
Recording Secretary	March 20, 2018 Date
Secretary	19-03-2018 Date

APPENDIX A

CMD	Date	E-Docs
2017-M-03	19-06-2017	5278266
Notice of Participation at a Commission Meeting and Participant Funding Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2016		
2017-M-04	20-06-2017	5279127
Notice of Participation at a Commission Meeting and Participant Funding Regulatory Oversight Report for Uranium and Mills in Canada: 2016		
17-M58	2017-11-15	5392922
Notice of Commission Meeting		
17-M59	2017-11-29	5395478
Agenda of the Meeting of the Canadian Nuclear Safety Commission (CNSC) to be held on Wednesday and Thursday, December 13 and 14, 2017 in the Public Room, 14th floor, 280 Slater Street, Ottawa Ontario		
17-M59.A	2017-12-07	5406667
Revised Agenda of the Meeting of the Canadian Nuclear Safety Commission (CNSC) to be held on Wednesday and Thursday, December 13 and 14, 2017 in the Public Room, 14th floor, 280 Slater Street, Ottawa Ontario		
17-M56	2017-12-12	5406701
Draft Minutes of the Meeting of the Canadian Nuclear Safety Commission held on October 11 and 12, 2017		
17-M60	2017-12-12	5406703
Draft Minutes of the Meeting of the Canadian Nuclear Safety Commission held on November 9, 2017		
17-M45	2017-10-13	5340424
Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2016 Submission from CNSC Staff		
17-M45.A	2017-12-06	5408923
Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2016 Presentation by CNSC Staff		

CMD	Date	E-Docs
17-M45.1	2017-11-13	5392850
Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2016 Submission from the Canadian Nuclear Workers' Council		
17-M45.2	2017-11-13	5392861
Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2016 Submission from Swim Drink Fish Canada and Lake Ontario Waterkeeper		
17-M45.3	2017-11-20	5397799
Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2016 Submission from Northwatch		
17-M45.4	2017-11-23	5398695
Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2016 Submission from the Algonquins of Ontario		
17-M45.5	2017-12-07	5410566
Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2016 Presentation by BWXT Nuclear Energy Canada Inc.		
17-M47	2017-10-13	5309714
Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2016 Submission from CNSC Staff		
17-M47.A	2017-12-06	5394414
Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2016 Presentation by CNSC Staff		
17-M47.1	2017-11-09	5390855
Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2016 Submission from the Saskatchewan Environmental Society		
17-M47.2	2017-11-12	5391997
Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2016 Submission from Val Drummond and Rodney Gardiner		
17-M47.3	2017-11-13	5392569
Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2016 Submission from the Canadian Nuclear Worker's Council		

CMD	Date	E-Docs
17-M47.4	2017-11-13	5392592
Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2016 Submission from Northwatch		
17-M47.5	2017-11-13	5392622
Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2016 Submission from Buffalo River Dene Nation and the Birch Narrows Dene Nation		
17-M47.6	2017-11-20	5398367
Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2016 Submission from Yà'thi Néné Land and Resource Office		
17-M47.7	2017-11-22	5399903
Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2016 Submission from Clarence Natomagan		
17-M61	2017-12-08	5410293
Status Report Status Report on Power Reactors Submission from CNSC Staff		
17-M64	2017-12-06	5409790
Status Report Update on Whole Site Probabilistic Safety Assessment (PSA) Presentation by CNSC Staff		
17-M64.1	2017-12-06	5410205
Status Report Update on Whole Site Probabilistic Safety Assessment (PSA) Presentation by Ontario Power Generation on the Whole-site PSA for Pickering		
17-M62	2017-11-22	5399068
Decision Items on Regulatory Documents REGDOC-2.13.1, Safeguards and Nuclear Material Accountancy Submission from CNSC Staff		
17-M62.A	2017-12-06	5409413
Decision Items on Regulatory Documents REGDOC-2.13.1, Safeguards and Nuclear Material Accountancy Presentation by CNSC Staff		
17-M62.B	2017-12-05	5408084
Decision Items on Regulatory Documents REGDOC-2.13.1, Safeguards and Nuclear Material Accountancy Supplementary Information from CNSC Staff		

CMD	Date	E-Docs
17-M63	2017-11-22	5358891
Decision Items on Regulatory Documents REGDOC-3.1.2 – Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills Submission from CNSC Staff		
17-M63.A	2017-12-06	5408194
Decision Items on Regulatory Documents REGDOC-3.1.2 – Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills Presentation by CNSC Staff		
17-M51	2017-12-06	5407981
Information Item Canada's Participation at the 7th Review Meeting of the Convention on Nuclear Safety Presentation by CNSC Staff		