



Minutes of the Canadian Nuclear Safety  
Commission (CNSC) Meeting held on  
December 15 and 16, 2021

Minutes of the Canadian Nuclear Safety Commission (CNSC) meeting held virtually on Wednesday, December 15, 2021 starting at 9:00 a.m. EST and Thursday, December 16, 2021, starting at 10:00 a.m. EST. The meeting was [webcast live](#) via the CNSC website, and [video archives](#) are available on the CNSC website. These minutes reflect both the public meeting itself and the Commission's deliberations following the meeting.

Present:

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

K. McGee, Assistant Commission Secretary  
L. Thiele, Senior General Counsel  
M. McMillan, Recording Secretary

CNSC staff advisors were: R. Jammal, A. Viktorov, K. Hazelton, B. Rzentkowski, J. Burta, K. Campbell, L. Sigouin, A. Bulkan, É. Fortier, S. Watt, L. Hunter, M. Fabian Mendoza, H. Tadros, B. Carroll, C. Cattrysse, L. Casterton, K. Sauvé, S. Lei, E. Kanasewich, G. Stoyanov, C. Purvis, S. Djefal, J. Stevenson, D. Moroz, P. Burton, D. Brown, D. Pandolfi, J. Lam, R. Froess, R. Lane, A. Levine, W. Stewart, A. McAllister, J. Way, A. Leroux, J. Thelen, C. Françoise, P. Tanguay and F. Dagenais.

Other contributors were:

- Bruce Power: M. Burton, J. Scongack and C. Mudrick
- Ontario Power Generation: V. Bevacqua, L. McWilliams, A. Grace, K. Brama, S. Irvine, M. Duarte, K. Aggarwal and S. Bagshaw
- New Brunswick Power: M. Power, N. Reicker, J. Nouwens, J. Lennox, K. Ward and K. Duguay
- Hydro-Québec: P. Desbiens
- Cameco Corporation: L. Mooney, K. Cuddington, K. Nagy, T. Smith and R. Peters
- Orano Canada Inc.: V. Laniece, T. Searcy and G. Lafleur
- Saskatchewan Research Council: I. Wilson and D. Chorney
- Crown Indigenous Relations and Northern Affairs Canada: A. Richardson
- Ministry of Northern Development, Mines, Natural Resources and Forestry: J.C. Gimon

- Barrick Gold Corporation: A. Brown
- Rio Algom Limited: A. Lambert
- Ministry of the Environment, Conservation and Parks: K. Faaren
- Denison Mines: D. Martens
- BWXT Nuclear Energy Canada: J. MacQuarrie and D. Snopek
- SRB Technologies (Canada) Inc.: S. Levesque and J. MacDonald
- Nordion: K. Brooks and R. Wassenaar
- Best Theratronics: J. Mayda
- McMaster University: C. Heysel
- Royal Military College of Canada: P. Chan
- Environment and Climate Change Canada: N. Ali and D. Kim
- Fisheries and Oceans Canada: S. Eddy
- Saskatchewan Health Authority: J. Irvine
- Saskatchewan Ministry of Environment: T. Moulding
- Ministry of Government Relations: S. Boyes

#### Constitution

1. With the notice of meeting set out in Commission member document (CMD) [21-M56](#) having been properly given and all permanent Commission members being present, the meeting was declared to be properly constituted.
2. Prior to the Commission meeting of December 15 and 16, 2021, [CMD 21-M33](#), [CMD 21-M34](#), [CMD 21-M36](#), and [CMD 21-M58](#) were distributed to members. These documents are further detailed in Appendix A of these minutes.

#### Adoption of the Agenda

3. The revised agenda, [CMD 21-M57.A](#), was adopted as presented.

#### Chair and Secretary

4. The President chaired the meeting of the Commission, assisted by K. McGee, Assistant Commission Secretary and M. McMillan, Recording Secretary.

#### CNSC Participant Funding Program

5. In its [Notices of Participation at the Commission Meeting](#), the CNSC invited members of the public and stakeholders who have an interest or expertise with regard to the content of the CNSC staff's regulatory oversight reports (ROR), to submit their

interventions in writing only. Indigenous intervenors were provided the opportunity to make oral presentations in the spirit of reconciliation and in recognition of the Indigenous oral tradition for sharing knowledge. CNSC announced the availability of funds through the [Participant Funding Program \(PFP\)](#) to assist in the review of these reports. A Funding Review Committee (FRC) - independent of the CNSC - reviewed funding applications and made recommendations for funding to the eligible applicants.

## STATUS REPORT ON POWER REACTORS

6. With reference to [CMD 21-M58](#), the Status Report on Power Reactors, CNSC staff provided the following updates:
  - Darlington Nuclear Generating Station (NGS) confirmed an additional reportable COVID-19 case, ([REGDOC 3.1.1 Reporting Requirements for Nuclear Power Plants](#)) with no impact to minimum shift complement or the safe operation of the facility.
  - Darlington NGS Unit 4 returned to service following its planned maintenance outage.
  - At Point Lepreau NGS, the unit is operating at 85.7% of full power.
7. The Commission asked for an update on what had been done with the steam generators removed from Bruce NGS Unit 6 as part of its major component replacement. A Bruce Power representative explained that the steam drum portion is cleaned and recycled, and the bottom portion of the steam generator is sealed and stored at Ontario Power Generation's (OPG) Western Waste Facility.
8. Regarding the cause of the Pickering NGS Unit 5 unplanned outage, an OPG representative explained that preliminary findings indicated that foreign material became dislodged from a stator cooling filter and caused flashover within a condenser waterbox. The OPG representative stated that repairs have been made and Unit 5 was in the process of being restarted.
9. On the turbine steam supply system vibrations at Bruce NGS Unit 2, a Bruce Power representative explained that one of the four governor valves for the high-pressure turbine was stuck closed. The Bruce Power representative confirmed that the unit could safely operate in this configuration but that it does cause some vibrations during high power operation. At the moment, Unit 2 was derated to reduce the vibrations. The Bruce Power representative noted that a fix had been installed that, once commissioned, would allow Unit 2 to return to full power operation.

10. The Commission asked if supply chain issues related to the ongoing COVID-19 pandemic had impacted unit refurbishments or major component replacements. Representatives from both OPG and Bruce Power stated that supply chain issues had not impacted their major projects. The Bruce Power representative stated that, though increased materials costs and human resource issues had created challenges, major projects were progressing well.

## INFORMATION ITEMS

### Regulatory Oversight Report for Canadian Nuclear Power Generating Sites in Canada: 2020

11. With reference to [CMD 21-M36](#), CNSC staff presented its regulatory oversight report on Canadian Nuclear Power Generating Sites for 2020 (the NPGS ROR). This report summarized CNSC staff's assessment of the performance of Canadian nuclear power generating sites, including nuclear power plants (NPP) and waste management facilities (WMF), for the 2020 calendar year.
12. The following nuclear power generating sites were covered in the NPGS ROR:
  - Darlington Nuclear Generating Station (DNNGS), which includes the Tritium Removal Facility and Retube Waste Processing Building;
  - Darlington Waste Management Facility (DWMF), which includes the Retube Waste Storage Building;
  - Pickering Nuclear Generating Station (PNGS);
  - Pickering Waste Management Facility (PWMF);
  - Bruce A Nuclear Generating Station and Bruce B Nuclear Generating Station;
  - Western Waste Management Facility (WWMF)
  - Radioactive Waste Operations Site-1 (RWOS-1);
  - Point Lepreau Nuclear Generating Station (PLNGS) and Solid Radioactive Waste Management Facility (SRWMF); and;
  - Gentilly-2 Facilities.
13. The NPGS ROR provided information focusing on the following:
  - CNSC staff's compliance verification activities;
  - CNSC staff's assessment of licensee performance in each of the [14 safety and control areas \(SCAs\)](#);
  - Operational highlights for each facility over the reporting period;
  - Indigenous and public engagement and consultation efforts by CNSC staff; and
  - Regulatory response to the COVID-19 pandemic.

14. CNSC staff informed the Commission that all NPPs and WMFs were operated safely throughout the reporting period. CNSC staff said that it rated all NPPs and WMFs “satisfactory” in all SCAs in 2020.
15. The Commission gave licensees the opportunity to comment on the NPGS ROR. Representatives from OPG, Bruce Power, New Brunswick Power (NB Power), and Hydro-Québec provided comments related to their respective licenced facilities. Overall, the licensees concurred with CNSC staff’s findings in the NPGS ROR and raised no specific issues.

#### *Interventions*

16. With respect to the CNSC PFP, an [FRC recommended](#) up to \$22,109 in participant funding be provided to the following 4 applicants, who in turn submitted written interventions:
  - Canadian Environmental Law Association (CELA)
  - Le Grand Conseil de la Nation Waban-Aki
  - G. W. Dalzell
  - Curve Lake First Nation

An additional written submission was received from the following intervenor:

- Canadian Nuclear Worker’s Council
17. CELA provided a written intervention ([CMD 21-M36.2](#)) to the Commission detailing its review of the NPGS ROR. CELA included 27 recommendations in areas including the scope and process for the ROR, emergency response, asbestos phase-out, derived release limits (DRLs), climate change, small modular reactors (SMRs), regulatory oversight during the COVID-19 pandemic, recent licensing decisions, and future decommissioning plans. CELA also noted that CNSC staff had not addressed some recommendations made in its intervention to the 2019 NPGS ROR.
  18. CNSC staff informed the Commission that recommendations and issues raised by intervenors are tracked internally. CNSC staff meets regularly with Indigenous Nations and communities as well as non-governmental organizations to discuss issues such as those raised through the ROR process.
  19. On asbestos phase out at nuclear facilities, CNSC staff explained that the [Prohibition of Asbestos and Products Containing Asbestos Regulations](#) (2018), include a four-year exemption period for nuclear facilities to identify all products containing asbestos and to determine whether there are technically or economically feasible

- alternatives for these products. During the exemption period, licensees must report annually to Environment and Climate Change Canada (ECCC) on the use of products containing asbestos in nuclear facilities. Following the exemption period, licensees must obtain a permit from ECCC for the use of products containing asbestos.
20. The Commission asked CNSC staff for clarification regarding the comment made in the 2019 [Report of the Integrated Regulatory Review Service \(IRRS\) Mission to Canada](#) concerning inconsistencies in the CNSC's derivation of DRLs. CNSC staff explained that it determines DRLs for radionuclides based on the quantity of a particular radionuclide which would result in the most exposed member of the public receiving a dose matching the public dose limit of 1 millisievert (mSv). In keeping with current international practice, licensees will be encouraged to further reduce release levels in the new draft regulatory document REGDOC 2.9.2, *Controlling Releases to the Environment*, which CNSC staff intend to bring before the Commission for review in 2022.
  21. On climate change, CNSC staff said that climate change is one of the uncertainties considered during development of safety analyses. CNSC staff participate in international studies and benchmarking regarding the impacts of climate change phenomena on the safety of nuclear facilities. At this time, CNSC do not see a need to update the safety analyses in this regard. This will be a consideration at the time of the 5-year safety analysis review cycles.
  22. Regarding emergency response, the Commission asked CNSC staff about public availability of the Provincial Nuclear Emergency Response Plan (PNERP) technical study. CNSC staff said that the study is available to the public [on request](#) through the Ontario Office of the Fire Marshal and Emergency Management (OFMEM). Typical request response time is under 24 hours. CNSC staff said that it was also given permission by the OFMEM to disseminate a copy of the study on request.
  23. On the future decommissioning of the Pickering NGS, an OPG representative said that OPG is undergoing a review to determine what actions would be needed to operate the Pickering NGS past 2024. OPG understands that Commission authorization will be required to operate the Pickering NGS beyond 2024.

24. Le Grand Conseil de la Nation Waban-Aki provided a written intervention ([CMD 21-M36.1](#)), expressing satisfaction with the content of the NPGS ROR and, specifically, the performance of Hydro-Québec at the Gentilly-2 facilities. Le Grand Conseil de la Nation Waban-Aki noted its interest in continuing to receive updates regarding the Gentilly-2 facilities.
25. The intervention by G. W. Dalzell ([CMD 21-M36.3](#)) provided comments related to NPP performance in the 14 SCAs, in particular, concerning aging management, staff certification, radiation protection and environmental protection. Overall, G. W. Dalzell agreed with CNSC staff's conclusion that licensees operated NPGS sites safely over the reporting period.
26. On aging management regulation, CNSC staff said that [REGDOC 2.6.3, \*Fitness for Service: Aging Management\*](#) sets out the requirements for managing aging of the structures, systems and components of a power reactor facility. CNSC staff also conduct inspections related to aging management to ensure that licensees are accounting for all possible degradation mechanisms. A representative from Bruce Power added that aging management is an ongoing program at the Bruce NGS A and B and that infrastructure renewal does not only occur during major component replacement.
27. On the availability of certified staff at the Point Lepreau NGS, an NB Power representative said that the Point Lepreau NGS has a proactive recruitment program for certified staff and that it is currently running more certification programs than it has before. The NB Power representative informed the Commission that the Point Lepreau NGS has an adequate number of certified staff in both certified control room positions.
28. On worker dose control at the Bruce B NGS, CNSC staff explained that the elevated dose seen in 2020 was attributed to the Unit 6 major component replacement project. CNSC staff said that worker dose for the major component replacement was within the planned dose target.
29. The Curve Lake First Nation (CLFN) provided a written intervention ([CMD 21-M36.4](#)) detailing its review of the NPGS ROR. The CLFN raised questions regarding environmental protection topics, specifically *Fisheries Act* authorizations and thermal plume monitoring, and described opportunities for ways that the oversight activities and assessments reflected in the NPGS ROR could be changed to be more respectful of Indigenous rights and perspectives. The Commission recognized the value added by the CLFN's intervention.

30. The interventions by CLFN (MD 21-M36.4) and G. W. Dalzell (CMD 21-M36.3) both raised concerns regarding [Fisheries Act](#) authorizations for NPPs. On the *Fisheries Act* authorization for the Point Lepreau NGS, an NB Power representative explained that NB Power had submitted a corporate-wide application which is awaiting completion of an impact assessment for the decommissioning of a hydro dam in Milltown prior to authorization being finalized. On the issuance of the Darlington offset plan, an OPG representative stated that OPG has conducted all field activities and issued all reports per the requirements of the Darlington *Fisheries Act* authorization to Fisheries and Oceans Canada (DFO). On Indigenous engagement, an OPG representative explained that OPG regularly meets with the Williams Treaties First Nations, DFO, and CNSC staff to discuss the impact of OPG's operations on aquatic life.
31. On thermal plume monitoring at the Pickering NGS, an OPG representative said that OPG conducted a two-year thermal plume monitoring study following the 2018 Pickering NGS licence renewal. The OPG representative stated that the results of the study support the 2018 Pickering NGS environmental risk assessment (ERA) conclusion that the thermal plume has no chronic adverse effect on round whitefish egg survival. The OPG representative said that the thermal plume study has been discussed at regular meetings between OPG and Indigenous Nations and communities. A representative from ECCC stated that ECCC has been involved in all thermal plume monitoring work done at OPG sites and that the results indicate that the potential for thermal effects are low.
32. The intervention by the Canadian Nuclear Workers' Council (CNWC) ([CMD 21-M36.5](#)) expressed the CNWC's agreement with the conclusions of the 2020 NPGS ROR.
33. Several intervenors provided recommendations on the content and scope of the NPGS ROR. CNSC staff noted it has published a discussion paper to solicit feedback from all interested parties on the entire ROR process. CNSC staff intend to discuss the results of this consultation, and the scope and content of future RORs, at a Commission meeting in January 2022.

#### *General Questions*

34. The Commission enquired about the concentration of iron in the Darlington NGS Unit 2 feed water system during Unit 2 return to service. An OPG representative explained that OPG has recently installed iron filtration skids to reduce iron transport during unit power down and return to service, improving equipment reliability and reducing radiological impact.

35. Asked about the lower chemistry compliance index at the Bruce NGS A and B, a Bruce Power representative explained that Bruce Power faced challenges with moderator isotopic purity in all Bruce NPGS units in 2020 due to unavailability of the Darlington tritium removal facility and the slow nature of the online moderator upgrading process. The Bruce Power representative said that Bruce Power increased the reliability of its upgraders and plans to focus on improving chemistry performance in 2022.
36. The Commission sought confirmation from CNSC staff that the licensees had implemented the requirements of [REGDOC 2.2.4, Fitness for Duty, Volume II: Managing Alcohol and Drug Use, Version 3](#) according to their implementation plans. CNSC staff stated that all licensees confirmed their implementation of the document, aside from random testing, by the July 2021 deadline. CNSC staff said that licensees have committed to implement the random testing portion of the required testing policies in January 2022, after which point CNSC staff will commence compliance verification activities.
37. The Commission asked CNSC staff how it considers cumulative environmental impacts and the impacts of climate change on environmental and safety related analyses. CNSC staff explained that it examines whether licensees have considered climate change in technical assessments in relation to safety and the environment. An ECCC representative stated that ECCC is developing more detailed guidelines with respect to the consideration of climate change and cumulative impacts on the environment.
38. Asked about the status of the pressure tube fracture toughness model, CNSC staff said that it has received the updated model and is in the process of finalizing its review. Regarding validation of the model, CNSC staff explained that it compares the model's predictions to previous pressure tube burst test results to ensure that the model is valid. As new data are collected, those results are used to further validate the model.
39. The Commission asked CNSC staff to explain the need for, and impact of, their having stopped on-site inspections at the beginning of the COVID-19 pandemic. CNSC staff said that, out of an abundance of caution, the CNSC paused on-site inspections for a period of less than 2 months during the early stages of the pandemic. CNSC staff said it never stopped oversight activities outright and never compromised safety. CNSC inspections were considered an essential service and on-site inspections were restarted safely, with remote components as deemed appropriate.

40. Regarding Indigenous engagement on emergency management matters, CNSC staff said that it meets with Indigenous Nations and communities on a regular basis and discusses emergency management issues as requested. CNSC staff also stated that it engages with Indigenous communities as part of the KI pill working group. A Bruce Power representative said that Indigenous Nations and communities are invited to participate in Bruce Power's emergency exercises. The Bruce Power representative also stated that Bruce Power works with Indigenous communities to enhance their emergency response capabilities.
41. Asked about the impact of unplanned worker tritium exposure events at OPG, CNSC staff clarified that no facility exceeded radiation dose limits in 2020. CNSC staff explained that tritium uptake is monitored by testing worker urine samples.
42. The Commission enquired about the status of certain projects at the Bruce NGS. On the post-Fukushima moderator coolant makeup modification, a Bruce Power representative said that all units except Unit 6 have the modification installed. The modification is being installed in Unit 6 during its major component replacement. On Bruce Power's emergency radio system replacement, the Bruce Power representative said that the system was fully installed as of December 2021.
43. Asked about foreign material exclusion events at the Bruce NGS, CNSC staff explained that most events were the result of contractors dropping objects into the fuelling machine duct or open systems during the major component replacement project. CNSC staff said that Bruce Power took appropriate corrective actions to retrieve each item and ensure that systems were cleaned.
44. On conventional safety performance data, CNSC staff clarified to the Commission that the "Canadian industry" data in Figures 11 and 12 of CNSC staff CMD 21-M36 represents the average values across Canadian NPPs. Regarding why third-party contractor data was not reported, CNSC staff explained that third-party contractor data is still monitored, but is not currently captured in [REGDOC-3.1.1, Reporting Requirements for Nuclear Power Plants](#) reports. Representatives from Bruce Power, OPG, Hydro-Québec, and NB Power each confirmed that their respective organizations track contractor safety data and have not identified any concerning trends. CNSC staff said that the inclusion of third-party contractor data has been proposed in the next revision of REGDOC 3.1.1 which is currently in the final stages of internal consultation.

45. The Commission asked OPG about its plans for final disposal of low and intermediate level waste. An OPG representative said that OPG decided to cancel its low and intermediate level deep geological repository project after the Saugeen Ojibway Nation voted against the project in January 2020. The OPG representative stated that OPG is actively participating in NRCan's work to develop a national integrated strategy for radioactive waste and OPG will continue to safely manage its wastes until permanent disposal facilities are developed. The OPG representative stated that OPG's existing financial guarantees are not impacted by waste storage at this time.
46. The Commission noted that IAEA inspectors were unable to access some spent fuel in the Pickering NGS and the Bruce NGS fuel bays. CNSC staff confirmed that it has worked with the IAEA and the licensees to ensure that inaccessible fuel is being made accessible.
47. Asked about defective fuel removed from Gentilly-2 reactor, a Hydro-Québec representative said that 35 of the 130,000 fuel bundles removed from the Gentilly-2 reactor over its lifetime were found to have fuel defects. The Hydro-Québec representative said that monitoring systems identified the defects while the reactor was in operation and that Hydro-Québec shared information on the fuel defects with the CANDU Owner's Group (COG).
48. Asked about its future regulatory oversight priorities, CNSC staff said that top regulatory priorities in the coming year include aging management, ongoing refurbishment projects, and monitoring the impacts of the COVID-19 pandemic on safe facility operations.

*Action Items*

49. Following the [2018 licence renewal hearing for the Bruce NGS](#), the Commission directed CNSC staff to include in the NPGS RORs an update on Bruce Power's implementation of a fully automated electronic data transfer system to the CNSC's Emergency Operations Centre. In the 2020 NPGS ROR, CNSC staff reported that Bruce Power had implemented the data transfer system and recommended that this action item be closed. The Commission is satisfied by the information provided by CNSC staff. Action item #14755 is closed. **ACTION**  
#14755  
Closed
50. The Commission directed CNSC staff to establish a regulatory position on risk aggregation at the [March 2014 Commission meeting](#). CNSC staff provided annual updates on this action item in the NPGS RORs. In the 2020 NPGS ROR and supplemental staff submission ([CMD 21-M36.B](#)), CNSC staff explained that it **ACTION**  
#8504  
Closed

actively engaged in international projects on site-level PSA and risk aggregation between 2015 and 2019. The results of these projects led CNSC staff to reiterate its position with regard to risk aggregation which remains as stated in section 4.2.2 of [REGDOC-2.5.2, Design of Reactor Facilities: Nuclear Power Plants](#). CNSC staff recommended that this action be closed. The Commission is satisfied by the information provided by CNSC staff. Action item #8504 is closed.

Regulatory Oversight Report for Uranium Mines, Mills, Historic and Decommissioned Sites in Canada: 2020

51. With reference to [CMD 21-M34](#), CNSC staff presented its regulatory oversight report on Uranium Mines, Mills, Historic and Decommissioned Sites in Canada for 2020 (the UMM ROR). This report summarized CNSC staff's assessment of the performance of Canadian uranium mines and mills licensed facilities for the year 2020 and the performance of Canadian historic and decommissioned uranium mines and mills sites over the period of 2018-2020.
52. The UMM ROR summarizes CNSC staff's assessment of the performance of the following uranium mines and mills facilities:
- Cigar Lake Operation
  - McArthur River Operation
  - Rabbit Lake Operation
  - Key Lake Operation
  - McClean lake Operation.

the following decommissioned uranium mines and mills sites:

- Former Lorado Mill
- Beaverlodge Mine Site
- Cluff Lake Uranium Mine and Mill
- Rayrock Closed Mine
- Port Radium Closed Mine
- Agnew Lake Tailings Management Facility
- Bicroft Tailings Storage Facility
- Dyno Closed Mine
- Elliot Lake Historic Sites
- Denison and Stanrock Closed Mines
- Deloro Mine

and the following historic uranium mines and mills sites:

- Gunnar Legacy Uranium Mine
- Madawaska Closed Uranium Mine

53. The UMM ROR provided the following information:
- a description of each site and its highlights over the reporting period;
  - regulatory oversight activities by CNSC staff, including those impacted by the COVID-19 pandemic;
  - CNSC staff's assessment of the performance of each site in each applicable SCA, with a focus on the radiation protection, environmental protection, and conventional health and safety SCAs;
  - CNSC staff's Indigenous engagement and consultation efforts.
54. CNSC staff's presentation included the following additional information:
- errata for the UMM ROR, all of an administrative nature and having no bearing on staff's assessment of licensee performance,
  - updates on previous Commission action items,
  - key themes raised by intervenors.
55. CNSC staff informed the Commission that all operational, historic, and decommissioned uranium mines and mills had satisfactory performance in all applicable SCAs over the reporting period. CNSC staff stated that all facilities had comprehensive radiation protection, environmental protection, and conventional health and safety programs in place.
56. The Commission gave licensees the opportunity to comment on the UMM ROR. Representatives from Cameco and Orano provided comments related to the performance of their respective licensed facilities over the reporting period.

#### *Interventions*

57. With respect to the CNSC PFP, an [FRC recommended](#) up to \$76,480 in participant funding be provided to the following 3 applicants:
- Curve Lake First Nation
  - English River First Nation
  - Ya'thi Néné Land and Resource Office

Additional written submissions were received from the following intervenors:

- Athabasca Joint Engagement and Environmental Subcommittee
- Canadian Nuclear Worker's Council

- Lac La Ronge Indian Band
- Saskatchewan Mining Association

An additional request to make an oral presentation was received from the following intervenor:

- Kineepik Métis Local and the Northern Village of Pinehouse

58. The Kineepik Métis Local and the Northern Village of Pinehouse (NVP) submitted a written intervention ([CMD 21-M34.2](#)) and gave an oral presentation ([CMD 21-M34.2A](#)), part of which was presented in the Cree language. The Kineepik Métis Local and the NVP acknowledged the positive engagement efforts by CNSC staff, Cameco, and Orano and suggested areas for improved engagement including the availability of documents in the Cree language.
59. On the availability of documents in Indigenous languages, CNSC staff said that it is considering the opportunity to translate a summary of the UMM ROR into the Cree language. Representatives from Cameco and Orano said that both companies offer Cree and Dene translations of their publicly available materials. CNSC staff, as well as the Cameco and Orano representatives, also noted that they have Indigenous language interpreters available as required when they meet with Indigenous Nations and communities. The Commission appreciates the efforts made by licensees and CNSC staff to make materials available in Indigenous languages.
60. Asked about Indigenous engagement in environmental monitoring programs, CNSC staff said that it sends letters to Indigenous Nations and communities ahead of its Independent Environmental Monitoring Program (IEMP) campaigns to solicit feedback to incorporate into the IEMP sampling plans. CNSC staff then disseminate the result of the IEMP campaigns to Indigenous Nations and communities via outreach events.
61. The English River First Nation (ERFN) provided the Commission with an oral presentation, a written submission ([CMD 21-M34.3](#)), and an Elder from the ERFN gave an opening prayer. The ERFN's intervention included its detailed review of the 2020 UMM ROR, which focused on indigenous engagement and environmental protection matters. ERFN expressed satisfaction with Cameco and Orano's prior responses to the questions raised in its intervention.

62. On Indigenous engagement regarding action level exceedances at uranium mine and mill facilities, the ERFN explained that Cameco and Orano provide plain language summaries of action level exceedance events which the ERFN then orally communicates to its community members.
63. On selenium releases from the McClean Lake Operation, an Orano representative explained that a selenium action level exceedance occurred in 2020 while changes were being made to the site's water treatment plant. The Orano representative said that, although Orano is forecasting increasing trends that could potentially cause future problems, environmental risk assessments to date have not shown adverse impacts of selenium loading on the receiving environment. The Orano representative said that Orano is making additional changes to the water treatment plant in 2022 to prevent future selenium action level exceedances.
64. The Commission asked about the *Healthy Fish Consumption Guidelines*<sup>1</sup> in place for water bodies downstream of the Beaverlodge site. A representative from the Saskatchewan Health Authority (SHA) stated that the guidelines, released jointly by the SHA and the Saskatchewan Ministry of Environment, describe how fish consumption from specific bodies of water near the Beaverlodge site should be limited due to historical selenium releases. The SHA representative informed the Commission of the specific quantities of different fish species deemed safe for consumption. A Cameco representative said that the selenium levels are expected to naturally improve over the course of hundreds of years.
65. The Commission enquired about molybdenum emissions at the McArthur River Operation. A Cameco representative explained that ecological risk assessments done in the early 2000s indicated that molybdenum posed a risk to the environment. In response, Cameco had implemented process changes at the McArthur River Operation prior to 2018 which reduced molybdenum concentrations in treated effluent. Since 2018, concentrations of molybdenum were further reduced by approximately 90% as a result of placing the facility into a state of care and maintenance.
66. The Ya'thi Néné Land and Resource Office (YNLR) provided to the Commission a written submission ([CMD 21-M34.8](#)) and an oral presentation ([CMD 21-M34.8A](#)) focusing on the importance of the land, the impact of industry on the land, Indigenous engagement, and the disposition of YNLR's past recommendations. The Commission noted that YNLR's inclusion of direct quotes from members of the Athabasca Land Protection

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<sup>1</sup> Saskatchewan Ministry of Environment, *Healthy Fish Consumption Guidelines*, 2016

- Committee was beneficial in understanding the communities' perspectives.
67. The Commission asked CNSC staff how they address recommendations from the YNLR and other intervenors. CNSC staff confirmed that concerns raised by intervenors are tracked internally to ensure they are addressed and dispositioned. With regard to the YNLR, CNSC staff said that it is working towards developing a terms of reference with the YNLR to support long-term engagement and to better address concerns raised by the YNLR. The Commission is satisfied that CNSC staff have a process in place to track and disposition intervenors' comments.
  68. The Curve Lake First Nation (CLFN) submitted its review of the UMM ROR as a written intervention ([CMD 21-M34.1](#)). Key recommendations raised in the CLFN's intervention included opportunities for improving Indigenous engagement in environmental monitoring programs and the development of a biological performance matrix.
  69. Regarding the development of a comprehensive biological performance matrix, CNSC staff said that site ERAs do consider both exposures to components in the environment as well as to receptors that consume a traditional diet. CNSC staff added that it has started to use Indigenous knowledge studies to support its reviews of the ERAs. A Cameco representative said that Cameco uses feedback from Indigenous Nations and communities to target its country food studies and communicate the impacts to community members. A representative from ECCC added that, per the [Metal and Diamond Mining Effluent Regulations](#), operational uranium mines must have a biological monitoring program including fish surveys, benthic invertebrate surveys, water quality monitoring, sediment monitoring. The Commission acknowledged the importance of evaluating environmental impact as a whole, in addition to the impact on individual receptors.
  70. The Lac La Ronge Indian Band (LLRIB) provided a written submission ([CMD 21-M34.6](#)) expressing satisfaction with Cameco's efforts to engage with the LLRIB over the reporting period through the LLRIB Collaboration Agreement.
  71. On collaboration agreements, CNSC staff clarified that the CNSC does not require licensees to formalize a specific type of agreement with Indigenous Nations and communities; however collaboration agreements are considered best practice.

72. The Athabasca Joint Engagement and Environmental Subcommittee (AJES) submitted a written intervention ([CMD 21-M34.7](#)) expressing satisfaction with Cameco and Orano's efforts to inform the AJES of their operations through the Ya'thi Nene Collaboration Agreement.
73. The Canadian Nuclear Workers Council (CNWC) and the Saskatchewan Mining Association (SMA) submitted written interventions ([CMD 21-M34.4](#) and [CMD 21-M34.5](#)) in support of CNSC staff's conclusion that Canada's uranium mine and mill sites were operated safely throughout the reporting period.

*General Questions*

74. Asked if Cameco faced challenges restarting the Cigar Lake Operation after shutting it down for COVID-19 precautions, a Cameco representative said that Cameco is experienced at bringing the Cigar Lake Operation back online following extended maintenance shutdowns. The Cameco representative stated that releases of treated water from the Cigar Lake Operation remain relatively constant during facility start-up and shutdown.
75. The Commission commented on a potential sanitary hazard associated with a radiological action level exceedance event at the Cigar Lake Operation. CNSC staff clarified that an air sampling dust pump, not a personal respirator, was shared between the two workers and that there was no sanitary hazard associated with the event.
76. The Commission asked if there could be negative environmental impacts associated with effluent monitoring ponds freezing during winter months. A Cameco representative confirmed that freezing of mining and mill facility effluent ponds does not impact the release of pollutants to the environment.
77. Asked about the high severity rate for lost-time injuries at the Rabbit Lake Operation, a Cameco representative explained that there was one lost time injury at the Rabbit Lake Operation in 2019 and none in 2020. The Cameco representative said that the 2019 incident was a repetitive strain injury where the employee was flown offsite for evaluation. The employee returned to work, but the lost hours continued to accrue into 2020.
78. The Commission offered representatives from other government departments the opportunity to provide comments. A representative Saskatchewan Ministry of Environment stated that the Ministry had no issues with CNSC staff's findings in the 2020 UMM ROR. A representative from the Saskatchewan Ministry of Government Relations recognized that licensees have been engaging with

northern communities and highlighted the need for continued engagement efforts.

79. The Commission commended CNSC staff for the clarity and thoroughness of the 2020 UMM ROR.

Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities and Research Reactors in Canada: 2020

80. With reference to [CMD 21-M33](#), CNSC staff presented its regulatory oversight report on Uranium and Nuclear Substance Processing Facilities and Research Reactors in Canada for 2020 (the UNSPF ROR). This report summarized CNSC staff's assessment of the performance of Canadian uranium and nuclear substance processing facilities for the year 2020 and the performance of Canadian research reactors for 2018-2020.
81. The uranium and nuclear substance processing facilities and research reactors are governed under CNSC licences issued to the following facilities:
- Cameco Blind River Refinery
  - Cameco Port Hope Conversion Facility (PHCF)
  - Cameco Fuel Manufacturing Inc. (CFM)
  - BWXT Toronto
  - BWXT Peterborough
  - SRB Technologies (Canada) Inc. (SRBT)
  - Nordion (Canada) Inc.
  - Best Theratronics Ltd.
  - École Polytechnique de Montréal SLOWPOKE-2 (ÉPM)
  - McMaster Nuclear Reactor (MNR)
  - Royal Military College of Canada SLOWPOKE-2 (RMC)
  - Saskatchewan Research Council SLOWPOKE-2 (SRC)
82. The UNSPF ROR provided information focussing on:
- an overview and operational highlights for each facility;
  - CNSC staff's regulatory oversight activities;
  - CNSC staff's assessment of licensee performance in all applicable SCAs, with focus on the radiation protection, environmental protection and conventional health and safety SCAs; and
  - CNSC staff's public and Indigenous engagement and consultation efforts.

83. CNSC staff's presentation included the following additional information:
- errata for the UNSPF ROR, none of which impacted the determinations made by CNSC staff;
  - changes to the format of the UNSPF ROR from previous years; and
  - key themes from interventions.
84. CNSC staff informed the Commission that licensees safely conducted operations at uranium and nuclear substance processing facilities and research reactors over their respective reporting periods. CNSC staff ranked each facility as "satisfactory" in each applicable SCA.
85. CNSC staff explained that, like the 2019 UNSPF ROR, the 2020 UNSPF ROR assessed facility performance using a simplified rating approach. Licensee performance in each SCA was assessed as either "satisfactory" or "below expectation" over the reporting period. The "fully satisfactory" rating is no longer in use. CNSC staff noted that a facility that previously received an SCA rating of fully satisfactory and now has a rating of satisfactory, does not necessarily indicate reduced performance.
86. The Commission provided licensees the opportunity to comment on the UNSPF ROR. Representatives from Cameco, BWXT Nuclear Energy Canada, SRB Technologies (SRBT), Nordion, Best Theratronics, McMaster University, and the Royal Military College of Canada each provided comments related to the UNSPF ROR and their respective licenced facilities.

#### *Intervenors*

87. With respect to the CNSC PFP, an [FRC recommended](#) up to \$34,165.54 in participant funding be provided to the following 2 applicants:
- Curve Lake First Nation
  - Algonquins of Ontario
- An additional written submission was received from the following intervenor:
- Canadian Nuclear Worker's Council
88. The Curve Lake First Nation (CLFN) submitted a written intervention ([CMD 21-M33.1](#)) detailing its review and recommendations regarding the UNSPF ROR. The CLFN provided recommendations related to environmental protection, and

- described opportunities to improve how oversight activities and assessments are reflected in the UNSPF ROR to be more respectful of Indigenous rights and perspectives. The CLFN also requested further information on the measures licensees are taking to prevent fish impingement.
89. The Commission asked for an update on fish impingement prevention at the Port Hope Conversion Facility. A Cameco representative said that multiple prevention measures are in place including a barrier in front of the water intake and thrusters to push fish and other materials away from the intake. The representative added that Cameco will be abandoning the cooling water intake in 2022 in favour of a closed loop cooling system. This will remove the opportunity for fish impingement.
90. The Algonquins of Ontario (AOO) submitted a written intervention ([CMD 21-M33.2](#)) including its technical review of the UNSPF ROR. In its intervention, the AOO also provided recommendations to CNSC staff and requested additional information on specific environmental and radiation protection topics including tritium concentrations observed at a monitoring well on the SRBT site.
91. The Commission asked CNSC to provide an oral explanation and update on the environmental impact of elevated tritium concentrations observed at a SRBT groundwater monitoring well. CNSC staff said that the well in question is located directly beneath SRBT's active ventilation stacks and that, though the well exceeded the Ontario Drinking Water Standard for tritium in 2020, the well could not be used for drinking as it is located on SRBT's site and access is restricted. CNSC staff stated that tritium concentration in this well has decreased over time and that even the historical high tritium levels would not result in adverse impacts to the nearby Muskrat River. A representative from Environment and Climate Change Canada (ECCC) added that the potential for impact on the local groundwater and surface water was low because the tritium levels were below the radiation dose thresholds for non-human biota. The Commission appreciated the clarification provided by CNSC staff and ECCC.
92. The Canadian Nuclear Workers' Council (CNWC) submitted a written intervention ([CMD 21-M33.3](#)) expressing its support for CNSC staff's conclusion in the UNSPF ROR that Canadian uranium processing facilities in Canada operated safely in 2020.

#### *General Questions*

93. The Commission enquired about releases from the Port Hope Conversion Facility (PHCF) to the Port Hope Harbour. CNSC staff clarified that Cameco does not release effluent into the Port Hope

- Harbour, rather, it takes and releases cooling water. Cameco monitors cooling water to ensure it meets criteria to be released back into Lake Ontario. In addition, CNSC staff noted that the PHCF has a groundwater collection system in place to address the historic groundwater contamination at the site.
94. The Commission asked for more information regarding the impact of the fluorine leak from the PHCF in July 2020. CNSC staff explained that the fluorine leak resulted in a peak release at the stack of 1600 grams of fluoride per hour. CNSC staff said that the release was below [Ontario's Ambient Air Quality Criteria](#) and as such, the risk to the environment and human health was determined to be negligible.
95. On environmental action level exceedances, CNSC staff explained that exceedance of an action level does not necessarily indicate an adverse environmental impact; rather, it is an early warning sign of a potential issue with a licensee's environmental protection program. Licensees set action levels far below regulatory release limits. CNSC staff stated that there were no adverse impacts to the environment resulting from the environmental action level exceedances reported during 2020.
96. The Commission asked for clarification regarding why the annual public dose from the PHCF was higher than that from other facilities. A Cameco representative explained that Cameco revised its public dose calculation in 2016 to consider a more conservative critical receptor who lives near the PHCF and spends all their recreational time at the PHCF fenceline. The receptor is represented by dosimeters located on the fenceline. CNSC staff noted that the annual public dose from the PHCF is still well below the annual limit.
97. Asked to explain how dose from the PHCF may impact those who consume a traditional diet near the facility, a Cameco representative explained that both its public dose calculation and its environmental risk assessment assess the uptake of uranium by people consuming traditional foods near the PHCF. The Cameco representative said that Cameco has worked with Curve Lake First Nation to plan studies related to specific items that its community members are foraging for in the vicinity of the PHCF. CNSC staff stated that CSA standards N-288.1<sup>2</sup> and N-288.6<sup>3</sup> also require facilities to consider the dietary needs of Indigenous Nations and communities when calculating dose to the public.

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<sup>2</sup> CSA Group, CSA N288.1-14, *Guidelines for calculating derived release limits for radioactive materials in airborne and liquid effluents for normal operation of nuclear facilities*, 2019.

<sup>3</sup> CSA Group, CSA N288.6-12, *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills*, 2012.

98. On the measurement of skin dose and whole body dose, CNSC staff explained that whole body dosimeters typically contain two chips – one at a depth to measure whole body dose and one at a different depth to measure dose to the skin. CNSC staff noted that, per the [Radiation Protection Regulations](#), dose limits are in place for effective dose, or whole body dose, as well as dose to the skin, lens of eye, and extremities.
99. Asked about the design of core cooling system for the McMaster Nuclear Reactor (MNR), a McMaster University representative explained that during normal operation the fuel is cooled by the downward flow of water being pumped into, and draining out of, the reactor pool. In the event of a pump failure, water is passively cycled through the core via natural convection.<sup>4</sup>
100. On human performance management, the Commission sought additional information regarding training non-compliances identified over the reporting period. CNSC staff confirmed that the non-compliances were primarily related to documentation of training and did not impact the robustness of licensees' training programs.
101. Further on human performance management, the Commission asked CNSC staff how the reactor operator at École Polytechnique de Montréal (ÉPM) operated its research reactor with an expired reactor operator certificate. CNSC staff explained that the event was likely caused by gaps in certification tracking while ÉPM staff were working from home due to the COVID-19 pandemic. CNSC staff said that, in response to the event, ÉPM has implemented corrective measures and certified a second operator. The Commission expressed satisfaction with CNSC staff's response.
102. The Commission asked for information on the packaging and transport events reported by Nordion. A Nordion representative stated that most events were related to lost packages or package damage. The Nordion representative explained that Nordion sent out thousands of shipments in 2020, often small packages of individual patient doses of Yttrium-90. On occasion, the packages would get lost by the mail carrier. Three lost package events occurred in 2020. Two of the three packages were located within a couple of days. The third package was not retrieved, however, radioactivity decayed below exemption quantities. The Nordion representative also explained that damaged packaging typically refers to dents and scrapes which do not impact the safety of the package.

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<sup>4</sup> Natural convection is flow induced by a fluid density differential. In the reactor pool, the temperature of the water closest to the fuel increases, thus its density decreases. As a result, the hot water rises in the pool.

103. On the SRC research reactor being granted a licence to abandon, an SRC representative said that the site is to be returned to a greenfield site with no equipment or contamination remaining above unconditional release limits.
104. The Commission commended CNSC staff for preparing a particularly detailed and well-organized ROR. The Commission appreciated the used of links throughout the document.

Closure of the Public Meeting

105. The public meeting closed at 12:00 p.m. EST on December 16, 2021

**McMillan,  
Megan**

Digitally signed by McMillan, Megan  
DN: C=CA, O=GC, OU=CNSC-CCSN, CN="McMillan, Megan"  
Reason: I am the author of this document  
Location: Ottawa, ON  
Date: 2022-01-24 14:52:32  
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Recording Secretary

24-Jan-2022

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Date

**Saumure, Denis**

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Commission Registrar

24-Jan-2022

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Date

APPENDIX A

CMD	Date	e-Docs No.
21-M56	2021-11-08	6674087
Notice of Virtual Meeting of the Commission on December 15 and 16, 2021		
21-M57	2021-11-18	6674122
Agenda of the Meeting of the Canadian Nuclear Safety Commission (CNSC) to be held remotely on December 15 and 16, 2021		
21-M57.A	2021-12-09	6697976
Revised Agenda of the Meeting of the Canadian Nuclear Safety Commission (CNSC) to be held remotely on December 15 and 16, 2021		
21-M58	2021-12-08	6697810
Status Report  Status Report on Power Reactors  Written submission from CNSC Staff		
21-M36	2021-09-01	6632934
Information Items  Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2020  Written submission from CNSC Staff		
21-M36.A	2021-12-08	6697774
Information Items  Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2020  Presentation from CNSC Staff		
21-M36.B	2021-12-08	6697791
Information Items  Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2020  Supplementary submission from CNSC Staff		
21-M36.1	2021-11-01	6672421
Information Items  Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2020  Written submission from the Grand Conseil de la Nation Waban-Aki		
21-M36.2	2021-11-01	6672440
Information Items  Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2020  Written submission from the Canadian Environmental Law Association		

21-M36.3	2021-11-01	6672781
Information Items		
Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2020		
Written submission from Gordon W. Dalzell		
21-M36.4	2021-11-01	6672786
Information Items		
Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2020		
Written submission from the Curve Lake First Nation		
21-M36.5	2021-11-01	6677394
Information Items		
Regulatory Oversight Report on Nuclear Power Generating Sites in Canada: 2020		
Written submission from the Canadian Nuclear Workers' Council		
21-M34	2021-09-10	6529001
Information Items		
Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020		
Written submission from CNSC Staff		
21-M34.A	2021-12-08	6646276
Information Items		
Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020		
Presentation from CNSC Staff		
21-M34.1	2021-11-01	6672827
Information Items		
Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020		
Written submission from the Curve Lake First Nation		
21-M34.2	2021-11-10	6680390
Information Items		
Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020		
Written submission from the Kineepik Métis Local and the Northern Village of Pinehouse		

21-M34.2A	2021-12-08	6698097
Information Items Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020 Presentation from the Kineepik Métis Local and the Northern Village of Pinehouse		
21-M34.3	2021-11-11	6680414
Information Items Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020 Presentation from the English River First Nation		
21-M34.4	2021-11-15	6677398
Information Items Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020 Written submission from the Canadian Nuclear Workers' Council		
21-M34.5	2021-11-15	6680442
Information Items Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020 Written submission from the Saskatchewan Mining Association		
21-M34.6	2021-11-15	6680954
Information Items Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020 Written submission from the Lac La Ronge Indian Band		
21-M34.7	2021-11-15	6680968
Information Items Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020 Written submission from the Athabasca Joint Engagement and Environmental Subcommittee		
21-M34.8	2021-11-22	6684715
Information Items Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020 Written submission from the Ya'thi Néné Land and Resource Office		

21-M34.8A	2021-12-08	6698107
<p>Information Items</p> <p>Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020</p> <p>Presentation from the Ya'thi Néné Land and Resource Office</p>		
21-M33	2021-08-30	6612658
<p>Information Items</p> <p>Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities and Research Reactors in Canada: 2020</p> <p>Written submission from CNSC Staff</p>		
21-M33.A	2021-12-15	6654545
<p>Information Items</p> <p>Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities and Research Reactors in Canada: 2020</p> <p>Presentation from CNSC Staff</p>		
21-M33.1	2021-11-01	6672808
<p>Information Items</p> <p>Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities and Research Reactors in Canada: 2020</p> <p>Written submission from the Curve Lake First Nation</p>		
21-M33.2	2021-11-01	6672814
<p>Information Items</p> <p>Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities and Research Reactors in Canada: 2020</p> <p>Written submission from the Algonquins of Ontario</p>		
21-M33.3	2021-11-12	6677393
<p>Information Items</p> <p>Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities and Research Reactors in Canada: 2020</p> <p>Written submission from the Canadian Nuclear Workers' Council</p>		