Canadian Nuclear Safety Commission

Commission canadienne de sûreté nucléaire

Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held on October 1 and 2, 2014

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Canada

Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held Wednesday, October 1, 2014 beginning at 1:00 pm and Thursday October 2, 2014 beginning at 9:00 am in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario.

Present:

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

M. Leblanc, Secretary
L. Thiele, General Counsel
M. Hornof/S. Gingras, Recording Secretaries

CNSC staff advisors were: R. Jammal, D. Newland, J. Leclair, D. Howard, G. Frappier, M. Couture, V. Tavasoli, D. Serghiuta, G. Rzentkowski, P. Corcoran, B. Gracie, J-B. Robert, M. Rinker, J. Amalraj, A. Erdman, B. Prieur, N. Howden, M. Langdon, R. Dwyer, S. Eaton, R. Lane, S. Nguyen, , B. Dowsley, E. Dagher, A. Rupert, C. Purvis, M. Jones, K. Owen-Whitred, A. Blahoianu and G. Stoyanov

Other contributors were:

- Bruce Power: F. Saunders
- Ontario Power Generation: R. Manley and C. Johnston
- Cameco Corporation: L. Mooney and K. Nagy
- AREVA Inc.: T. Van Lambalgen, D. Huffman, J. Richards and J. Corman
- GE Hitachi Nuclear Energy Canada: P. Mason and P. Desiri
- SRB Technologies (Canada) Inc.: S. Levesque
- Nordion (Canada) Inc.: R. Beekmans
- Ministry of Economy – Government of Saskatchewan: K. Cunningham
- Saskatchewan Ministry of the Environment: K. McCullum and D. Kristoff
- Northern Saskatchewan Medical Health Officer: J. Irvine

Constitution

1. With the notice of meeting CMD 14-M57 having been properly given and all eligible permanent Commission Members being present, the meeting was declared to be properly constituted.

2. Since the meeting of the Commission held August 20 and 21, 2014, Commission Member Documents CMD 14-M50 and CMD 14-M57 to CMD 14-M66 were distributed to Members. These documents are further detailed in Annex A of these minutes.

Adoption of the Agenda

3. The revised agenda, CMD 14-M61.A, was adopted as presented.

Chair and Secretary

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

Minutes of the CNSC Meeting Held August 20 and 21, 2014

5. The Commission Members approved the minutes of the August 20 and 21, 2014 Commission Meeting as presented in CMD 14-M62.

STATUS REPORTS

Status Report on Power Reactors

6. With reference to CMD 14-M63, which includes the Status Report on Power Reactors, CNSC staff had no additional information.

7. CNSC staff reported having prepared a briefing note on the technical issues related to fuelling machines that was raised at a previous meeting. CNSC staff concluded that the safe operation of the CANDU reactors is not significantly affected when fuelling machines become unavailable or unproductive.

8. The Commission asked for more information on issues associated with the operation of the fuelling machines. The OPG representative explained that a comprehensive fuel handling reliability plan was in place, with improved reliability machines. A root cause analysis was also done and problems that were discovered have been fixed. The OPG representative added that the 80 per cent availability target has been met and that their reliability plans are focused on obtaining a much higher value.

9. The Commission asked for more information on reliability differences between sites. The OPG representative responded that, while each site is unique, OPG has determined a list of the top five fuel handling reliability issues that are being worked on to improve reliability, and provided a description of the top three issues. The Commission further asked about qualified resources. The OPG representative noted that, while there are challenges in that area, they are currently adequately staffed. The Commission expressed its appreciation for the briefing note and the explanations.

10. The Commission asked for the number of Equivalent Full Power Hours (EFPH) that Bruce B Units 5 and 6 will have been operating as of April 2015. The Bruce Power representative responded that they expect Unit 5 to be at around 212,000 EFPH and Unit 6 to be at around 210,000 EFPH.

INFORMATION ITEMS

CNSC Staff Report on the Performance of Uranium and Nuclear Substance Processing Facilities: 2013

11. With reference to CMD 14-M59 and CMD 14-M59.A, CNSC staff presented its annual report, *Performance of Uranium and Nuclear Substance Processing Facilities: 2013* (NPFD Report), to the Commission. The report details the results of CNSC staff's safety performance analysis of Canadian uranium and nuclear substance processing facilities focussing on three Safety and Control Areas (SCAs): radiation protection, environmental protection and conventional health and safety. The report provides information on the three Cameco and two GE Hitachi (GEH) uranium processing facilities. The report also provides information on Nordion (Canada) Inc. (Nordion) and SRB Technologies (SRB) nuclear substance processing facilities, and includes some information on the now closed Shield Source Incorporated (SSI) facility.

12. CNSC staff noted that the NPFD Report also provided information on the Fukushima Daiichi Accident CNSC Integrated Action Plan and International Atomic Energy Agency (IAEA) inspections. During their presentation, CNSC staff provided updates on the status of the financial guarantee for Best Theratronics, an update on the cell room event at the Port Hope Conversion Facility (PHCF) and the status of the actions that were requested of GEH by the Commission in December 2013.

13. CNSC staff concluded that overall, the Canadian uranium and nuclear substance processing industry continued to operate safely in 2013 and met performance expectations with respect to the health and safety of persons, the protection of the environment, and Canada's international obligations.

Comments by Licensees' Representatives

14. The Cameco representative stated that the company's highest priorities are health and safety of workers and the public, as well as protection of the environment. The Cameco representative further stated that the company is proud of its 2013 performance and that the fuel processing division had the best safety year in its history in 2013 due to direct employee involvement in safety initiatives. Cameco has well-established management systems that provide opportunity for systematic improvement while maintaining strong performance, and is committed to ensuring that operations continue to be safe, clean and reliable.

15. The SRB representative noted that, in addition to the positive performance indicators in the 2013 NPFD Report, SRB continues to make improvements to its facility, programs and organization in 2014. SRB is also actively involved in reviewing its decommissioning program and establishing an appropriate financial guarantee for the facility.

16. The Nordion representative presented CMD 14-M59.3 to the Commission and gave a brief overview of the changes to the Nordion corporate structure as a result of its acquisition by Sterigenics in August 2014. The Nordion representative assured the Commission of its continued commitment to the protection of health, safety and the environment.

Interventions – Written Submissions

17. Following a written submission from Lou Rinaldi, M.P.P., Northumberland-Quinte West, the Commission enquired about the public information sessions that Cameco conducted in Port Hope. CNSC staff responded that they have observed that the sessions are well attended by the public and that Cameco now has a healthy relationship with the public. The Cameco representative stated that they have conducted over 20 of these sessions and confirmed Cameco's commitment to open and transparent communication with stakeholders.

18. The Commission asked Cameco whether they use these public information sessions to report events to the public. The Cameco representative stated that, when a reportable environmental event occurs, it is posted on their corporate website. Quarterly updates are also given to the Port Hope elected council.

19. Following a written submission from the Municipality of Port Hope, the Commission enquired whether CNSC staff reviews the regular opinion surveys that were referred to in the submission. CNSC staff responded that they review them and that Cameco posts the results on their website. The Cameco representative stated that, in general, the surveys show community support for the Port Hope facilities.

General Questions

20. The Commission enquired about whether the public can feel confident in the safety of the decontaminated SSI facility and its use for non-radiological activities. CNSC staff responded that they are completing a document intended for the public that summarizes the data collected at the facility, as well as its current state and the state of the environment surrounding the facility.

21. The Commission asked about the slight increase to doses to the public at several uranium processing facilities. CNSC staff responded that the dose to the public at the Cameco Blind River facility has gone up only very slightly. With respect to the GEH facility in Peterborough, CNSC staff reported that prior to 2012, GEH submitted data on their releases and CNSC staff performed calculations for the doses to the public. In 2012, GEH began submitting dose calculations to the CNSC and the calculation methodology, based on CSA standards, differed slightly, leading to slightly higher reported doses. CNSC staff added that fluctuations in public dose rates can also occur with changing production rates in the facilities. CNSC staff did emphasize, however, that these doses are still well below the 1 mSv public dose limit as well as facility action levels, and that the Commission could have confidence in the values presented in the NPFD Report.

22. The Commission enquired about the frequency and results of inspections and audits, including IAEA inspections, at uranium and nuclear substance processing facilities. The Cameco representative responded that many inspections and audits are conducted annually and provide visibility to how often these facilities are inspected. CNSC staff added that they receive a statement from the IAEA after every IAEA-led inspection. With the adoption of the randomized inspection approach, the IAEA can conduct fewer inspections while retaining the same confidence in its evaluation.

Cameco

23. The Commission enquired about how the errors in internal dose calculations at Cameco Fuel Manufacturing (CFM) could occur for almost 10 years. CNSC staff explained the event and stated that since Cameco's identification of the error in 2013, CNSC staff has changed its oversight protocols for these situations and has ensured that appropriate corrective actions have been implemented by Cameco.

24. The Commission requested more information about the application that Cameco has submitted to the CNSC to introduce direct internal dosimetry using the lung counting method at its CFM facility. CSNC staff responded that Cameco is licensed for the lung counting method at the PHCF and at the Blind River facility, and that the application is being reviewed.

25. The Commission enquired about why the doses of contractors that are nuclear energy workers (NEWs) were included in the 2013 PHCF NEW dose statistics that were presented to the Commission. CNSC staff responded that due to the high proportion of contractor NEWs at the PHCF, CNSC clarified its expectations with respect to reporting of NEW doses.

26. The Commission asked how Cameco and CNSC staff could be confident that there would be no additional releases to the groundwater from the PHCF. CNSC staff responded that while the source of contamination identified six years ago has been remediated, there is still some contamination remaining underneath the buildings, making it difficult to identify whether contamination in the monitoring wells is from a new source or from the previous sources. CNSC staff further added that after conducting inspections, no other potential sources of groundwater contamination have been identified at this time.

27. The Commission requested more information about the timelines for the Cameco Vision in Motion project. CNSC staff responded that although formal timelines have not yet been received from Cameco, CNSC staff expects to receive an application for the project in late 2014 or early 2015. CNSC staff also noted that Cameco is currently undertaking other remediation activities under its licence. The Cameco representative added that the project is progressing and that Cameco is continuing to work with the Port Hope Area Initiative. The Commission enquired about the next comprehensive update for the Vision in Motion project. CNSC staff responded that a detailed update can be provided in the 2014 NPFD Annual Report. Or, if an application is received in early 2015, a public hearing will likely be held during the fall of 2015 to request authorization of the project.

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GE Hitachi

28. The Commission enquired about the progress that GEH has made in developing its public information program and whether they have considered conducting public opinion surveys. The GEH representative responded that GEH has established a communications team that meets regularly to discuss the public information program. The communications team has discussed the benefits and downfalls of doing such a survey and this is currently an open item.

29. The Commission further enquired about the level of community engagement at outreach activities for its Toronto, ON facility, and about how GEH is measuring the level of acceptance in the community. The GEH representative responded that emails, website visits and telephone calls to the facility have dropped dramatically in the past year, indicating to GEH that there has been a decrease in public concern about the facility. GEH is planning a virtual public meeting in November 2014 to ensure that the public can ask the company questions without distractions or safety concerns.

30. The Commission asked GEH for more information about the community liaison committee that was created for the Toronto facility. The GEH representative stated that the committee consists of residents that live on neighbouring streets and that, through meetings, the level of anxiety about the facility in the community has decreased. Plant tours have been conducted at the Toronto facility increasing public trust in GEH. The GEH representative further stated that in Peterborough, ON, GEH has held meetings at the local school and has also conducted facility tours. These initiatives have been important in building community support and trust in Peterborough, and GEH plans to continue this outreach in both communities.

31. The Commission enquired about the decline in GEH's rating for the conventional health and safety SCA from "Fully Satisfactory" to "Satisfactory". CNSC staff responded that while GEH's conventional health and safety program was superior to those of peer facilities in previous years, these facilities have since improved their programs. GEH's performance is now reflective of the industry's current standards and no longer exceeds them. CNSC staff emphasized that GEH's performance in conventional health and safety has remained consistent and the decrease in rating is not reflective of a decrease in health and safety at their facilities. The GEH representative stated that the ratings are very important to GEH.

32. The Commission requested more information about the uranium contamination in soil on the CP Rail property near the GEH facility in Toronto. The GEH representative responded that a third party company performed sampling of the three square metre contaminated area on the CP Rail property. Eighteen samples were taken and the uranium concentrations were found to be well below Canadian limits for residential and commercial property. The GEH representative further stated that they were advised by legal counsel to not remediate the property as this would set remediation precedents and undermine accepted contamination limits. CNSC staff stated that if GEH's data is validated by the CNSC, they have no regulatory concern with this course of action. The Commission suggested that posting the sampling results on the GEH website may alleviate community concern. The GEH representative agreed that posting the information was a good idea.

SRB Technologies

33. The Commission enquired about groundwater tritium concentrations at SRB, the long term plan for reducing the concentrations, and groundwater flow characterization around the facility. CNSC staff responded that approximately five years ago, calculations were performed by CNSC staff to model how tritium

concentration in groundwater would change with time. The long term prediction is that the highest concentration of tritium in the groundwater will be approximately 40,000 Bq/L and that tritium in groundwater around the facility will be eliminated only after production at SRB ends. The SRB representative added that tritium concentrations have decreased over time, and that due to the long time required for tritium infiltration into groundwater, the current concentrations in the wells are reflective of historical emissions at the facility from the 1990s.

34. The Commission further enquired whether emissions from SRB will increase with increased production at the facility and whether SRB has plans for controlling them more effectively. The SRB representative indicated that of 57 groundwater monitoring wells, 32 groundwater monitoring wells are within 150 metres of SRB, and that in 2013 only four of these wells were over provincial limits for drinking water. Presently, in 2014, even with increased production at the facility, only three groundwater monitoring wells are over this limit. Emissions from the facility have been reduced to six or seven percent of what they were 10 years ago and continue to decrease due to new emission reduction initiatives. SRB expects that in the future no groundwater monitoring wells will be over the provincial drinking water limit.

35. The Commission asked about the status of the financial guarantee for the SRB facility. CNSC staff responded that a revised financial guarantee is currently under CNSC review. The SRB representative added that the financial guarantee approved by the CNSC in 2007 has been fully funded and through observation of the clean-up and decontamination activities conducted at SSI during 2013, SRB has been able to incorporate lessons learned into their preliminary decommissioning plan. The SRB representative emphasized that they are fully committed to meeting their regulatory obligations.

36. The Commission enquired about SRB's relationship with the community. The SRB representative indicated that the last inquiry about the facility from a member of the public was in 2011, and provided details on their comprehensive public engagement activities. The Commission notes that the relicensing hearing will take place in the community in May 2015, and that members of the public and aboriginals will be invited to participate.

Nordion (Canada) Inc.

37. The Commission noted that in the NPFD Report, CNSC staff stated that Nordion's public information program "requires improvements to be satisfactory", and requested more information about the program. CNSC staff responded that Nordion's public information program does not yet meet all of the criteria in Regulatory

Document 99.3: *Public Information and Disclosure*. The Commission further enquired about how the acquisition of Nordion by Sterigenics will affect their public information and outreach programs. The Nordion representative stated that there will be no impact since Nordion is an independent entity of Sterigenics.

38. The Nordion representative further stated that Nordion is in the process of improving its public information program and has submitted details of this new program, which contains several upgrades, to CNSC staff.

39. The Commission requested more information about Nordion's multiple non-compliances with respect to their export licences and the related regulatory action taken by the CNSC. CNSC staff summarized the non-compliances and indicated that they have applied graduated enforcement to promote compliance. However, due to repeat non-compliances, an Administrative Monetary Penalty (AMP) was issued to Nordion in September 2014 (the AMP was paid in full by Nordion). The Nordion representative stated that Nordion takes this matter seriously, and that it has performed a detailed investigation which resulted in multiple corrective actions as well as a report that was submitted to the CNSC. The Nordion representative further stated that Nordion takes full responsibility for the non-compliances but feels that there were some communication problems with the CNSC on compliance expectations. The Commission noted that CNSC staff also had to take some responsibility for its role in this matter and that corrective actions were taken by CNSC staff after the event as well.

<u>CNSC Staff Report on the Performance of Uranium Mine and Mill Facilities: 2013</u>

40. With reference to CMD 14-M58 and CMD 14-M58.A, CNSC staff presented its annual report, *Performance of Uranium Mine and Mill Facilities: 2013* (UMM Report), to the Commission. The report details the results of CNSC staff's safety performance analysis of Canadian uranium mines and mills, focussing on three SCAs: radiation protection, environmental protection and conventional health and safety.

41. CNSC staff noted that the UMM Report also provided information on the lessons learned from the Fukushima Daiichi accident and about the Eastern Athabasca Regional Monitoring Program (EARMP) – Country Foods. During their presentation, CNSC staff provided updates on the Allan Potash Mine underground truck fire in Saskatchewan, and the Kiggavik, Millenium, Gunnar and Lorado projects.

42. CNSC staff noted a correction to Table 2-5 on page 22 of CMD 14-M58. Three transcription errors were made and the revised data were presented to the Commission. CNSC staff specified that the corrected values do not change the conclusions made in the UMM Report.

43. CNSC staff concluded that overall, the Canadian uranium mines and mills industry remains safe in terms of workplace safety, and protection of the public and the environment from radiological releases. The Commission expressed its satisfaction with the UMM Report.

Comments by Licensees' Representatives

44. The Cameco representative stated that the company is proud of their 2013 performance and that the UMM Report is reflective of this. Cameco was pleased that the English River First Nation and the CNSC recognized the importance of the EARMP and stated that the regional ecosystem remains protected.

45. The AREVA representative expressed the company's commitment to the protection of workers, the public and the environment. AREVA appreciates the CNSC's efforts to continue to streamline the regulatory process and maintain transparency to the public through the UMM Report.

Interventions – Written Submissions

46. Following a written submission from an intervenor, the Commission requested that CNSC staff comment on the intervenor's assertion that no mine or mill site in the world has been permanently cleaned up in a satisfactory way. CNSC staff responded that the report quoted in the intervention was published in 1993 and that, since that time, there have been tremendous advancements made in the decommissioning of mines and mills. CNSC staff added that Cluff Lake is an example of a successfully decommissioned facility, and noted that many of the sites that are currently being decommissioned are legacy sites which are representative of operating practices that are no longer deemed acceptable.

47. The Commission asked about the status of the remediation of tailings at legacy sites. CNSC staff responded that in 2001, the Contaminated Lands Evaluation and Assessment (CLEAN) program was implemented and that all legacy mining sites were evaluated. All sites that were determined to be under NSCA jurisdiction, with the exception of the former Gunnar mine site, have since been issued licences and brought under CNSC regulatory control to ensure that appropriate remediation was performed at these sites.

48. The Commission enquired about the environmental status of lakes around the decommissioned mines. CNSC staff responded that while historical practices for tailings management included storing them at the bottom of lakes and that their recovery is a slow process, these lakes are recovering with the help of multiple management and monitoring programs to ensure that there are no further environmental impacts.

49. The Commission enquired whether the Key Lake Tailings Management Facilities (TMFs) were built without consideration of the safety and environmental risk that frozen tailings (ice lenses) could present. The Cameco representative assured the Commission that although freezing affects the rate of tailings consolidation, it does not affect the environmental performance of a TMF. CNSC staff further responded that ice lenses become a safety and environmental risk only if they begin to melt after a cover has been put on the facility following decommissioning. CNSC staff are confident that the chemical composition of the tailings, as well as the climate around the TMFs, have been thoroughly researched and CNSC staff does not support the concerns that were raised.

50. The Commission requested clarification on the meaning of the "bystander effect" and its relevance to radiation protection in uranium mines and mills. CNSC staff explained the bystander effect, and that it is one of many biological mechanisms that occur at a cellular level during radiation exposure. CNSC staff further explained that the evidence-based linear non-threshold hypothesis is used in radiological protection programs. The Commission enquired whether there could be validity to the intervenor's statements about the bystander effect (as an isolated phenomenon) as it relates to the radiation emitted from uranium. CNSC staff agreed to provide the Commission more information on this subject at a later date.

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51. The Commission asked about whether there is any evidence that uranium miners have higher rates of lung cancer than the general population. The Northern Saskatchewan Medical Health Officer (MHO) responded that a 1982 study showed that the rates of lung cancer in uranium miners were slightly elevated, but that these rates may have been impacted by other exposures such as smoking, diesel fuels, and poor mine ventilation. Causation is therefore difficult to establish, especially since rates of overall cancers combined were similar to those of the general population. CNSC staff added that while uranium miners did have higher rates of lung cancer in the past, a current ongoing study shows that today's uranium miners are as healthy as the general population.

52. The Commission enquired about the intervenor's concern regarding the ALARA cost-benefit approach and how it addresses radiation protection expectations. CNSC staff responded that the intervenor may have confused the ALARA principle with overall expectations set out in the regulatory dose limits for both the public and for nuclear energy workers. Using the ALARA principle, uranium mines and mills licensees have maintained doses well below these regulatory limits, as discussed in the UMM Report.

53. Following a written submission from the English River First Nation, the Commission enquired whether the English River First Nation is involved in the sampling and results for the EARMP. The Saskatchewan Ministry of Environment (SMOE) representative responded that while the English River First Nation is not directly involved with the sampling, they are kept informed of the results and that the program can be adapted to include them to a greater extent.

General Questions

54. The Commission asked whether a comparison of the performance of Canadian and international uranium mines has been done. CNSC staff responded that while they remain informed about the international uranium mining industry, Canada is often looked upon as a leader in this area and is committed to providing guidance to other countries involved in uranium mining. CNSC staff added that performing direct comparisons with international uranium mines is difficult because other countries have significantly lower uranium grades and often use different mining methods.

55. The Commission asked about why there was a large variation in the time required for decommissioning between facilities. CNSC staff responded that various factors such as the type of facility, environmental influences and history of the facility are analyzed to determine the decommissioning schedule, and that TMFs typically require longer decommissioning schedules than mines. The Commission further enquired whether the current financial guarantees for the decommissioning of the facilities were reflective of the decommissioning schedules that were presented. The Cameco and AREVA representatives stated that all current financial guarantees are based on the referenced schedules.

56. The Commission enquired whether tailings would be added to the above ground TMF at Key Lake in the future. CNSC staff responded that they have not received any applications in this regard. The Cameco representative advised the Commission that the company has no plans at this time to add tailings to the above-ground TMF.

57. Since the stabilization of the slope of the Deilmann TMF took place over the course of five years, the Commission asked whether this was consistent with the CNSC licence condition stating that the work be performed in a timely manner. CNSC staff stated that several studies had to be conducted prior to performing the remediation work to determine the cause of the sloughing in the TMF. When the cause of the sloughing was identified, the licensee created a work plan and executed this plan successfully while ensuring the health and safety of its workers and the environment. The Cameco representative stated that the company considered this project a success.

Conventional Health and Safety

58. The Commission expressed satisfaction that all of the action notices issued to uranium mines and mills licensees in 2013 were closed, and enquired about the nature of these notices. CNSC staff responded that the licensees generally respond very quickly to action notices and that none of the notices issued in 2013 were of a serious nature that required an extensive time to address.

59. The Commission enquired about licensee follow-up and lessons learned from external events such as the Fukushima Daiichi accident and the Allan Potash Mine fire. CNSC staff responded that after external events occur, follow-up is always done to ensure that facilities under CNSC regulatory control have the proper measures in place to ensure the prevention of a similar event. The Commission requested assurances that a total loss of communications and back-up power systems would be unlikely to occur in a uranium mine. The Cameco representative assured the Commission that due to the remote locations of the mines, they have ensured that multiple power, communications, and health and safety back-up systems are available in all of the mines. CNSC staff concurred with the availability of these safety measures.

Environmental Protection

60. The Commission enquired about whether any radiation protection action levels were exceeded at the uranium mines and mills in 2013. CNSC staff responded that while some action levels were exceeded, CNSC staff is satisfied that appropriate action was taken by the licensees to respond to the exceedances.

61. The Commission wondered about the relevance of comparing uranium mine and mill effluent quality to that of other mining sectors, since only five uranium mine and mill facilities are considered, and stated that a more accurate comparison would be to compare the number of tests performed at the facilities. CNSC staff concurred that this data could be presented differently.

62. The Commission asked whether the *Daphnia magna* effluent toxicity test[1] was performed by uranium mine and mill licensees. CNSC staff responded that the test is part of the environmental effects monitoring program but that the results are not in the UMM Report because they are not a regulatory requirement, unlike the rainbow trout acute-lethality test[2]. The Commission further enquired whether the rainbow trout acute-lethality test is simply a binary test or whether other results beyond the binary test results are monitored. The Cameco representative stated that although there is no regulatory requirement to monitor results other than the binary test results, if a trend is observed, it is investigated.

63. The Commission enquired about how molybdenum reference levels in effluent were determined. The Cameco representative stated that the 1 mg/L molybdenum administrative level was determined using the 2005 McArthur River Environmental Risk Assessment. CNSC staff noted that while there are no provincial or federal limits for molybdenum concentrations in effluent, licensees must adhere to administrative and action levels to comply with their environmental codes of practice.

64. With respect to the EARMP for traditional country foods, the Commission enquired about which chemicals were found to be above the guidelines. The SMOE representative responded that while there were outliers in the data, the baseline data is still being collected and that conclusions cannot yet be drawn on the nature of the outliers. The Northern Saskatchewan MHO concurred, adding that some of the outliers for lead concentration may have been due to sample collection practices, and stated that the selenium concentration data also contained outliers. The Commission further enquired how this information is shared with the affected communities. The Northern Saskatchewan MHO responded that the results are shared through community meetings, on the EARMP website and that community members are being informed of the health benefits of traditional country foods in comparison with store-bought foods.

65. The Commission requested more information about the radium-226 and thorium-230 reference soil quality level exceedances at the McClean Lake facility. CNSC staff responded that the comparative data presented in the UMM Report are reference levels and indicative of average background concentrations, and therefore do not indicate regulatory limit exceedances. The Commission suggested that including levels which might represent a health and

[1] In this effluent toxicity bioassay, *Daphnia magna* are used to test for the concentration of an effluent's toxicity by determining the lethal concentration, 50, (LC_{50}), or the half maximal effective concentration (EC_{50}) of an effluent.

[2] The rainbow trout acute-lethality test uses rainbow trout fingerlings or swim-up fry by placing them into undiluted effluent for 96 hours. If more than half of the fish die, the effluent is deemed to be acutely lethal.

safety concern in the table would provide more useful data. CNSC staff agreed to consider that for future reports.

CNSC Staff Update Regarding the Mount Polley Tailings Dam Breach

66. With reference to CMD 14-M66, CNSC staff presented an update on the Mount Polley tailings dam breach in British Columbia. CNSC staff provided a summary of the actions taken by CNSC staff and licensees since the events at Mount Polley, as part of the continuous improvement philosophy to review lessons learned from external events, both nuclear and non-nuclear (such as this one).

67. CNSC staff informed the Commission that the British Columbia provincial government initiated an independent investigation into the Mount Polley tailings dam breach and that the report will be completed in January 2015. CNSC staff and licensees will evaluate the findings at that time to determine any lessons learned for the uranium mining industry. CNSC staff assured the Commission that the risk of a dam failure at sites under CNSC regulatory control is very unlikely due to strict engineering requirements and rigorous regulatory oversight.

Comments by Licensees' Representatives

68. The Cameco representative stated that Cameco has closely monitored the situation at Mount Polley and understands the importance of incorporating lessons learned from this event into its operations. The Cameco representative also confirmed that they provided CNSC staff with the information requested in August 2014, and stated that Cameco is confident in the long-term stability of its TMFs.

69. The AREVA representative stated that the Cluff Lake site (AREVA's only above-ground TMF) is stable, safe and regularly inspected. AREVA also assured the Commission that they plan to incorporate lessons learned from the January 2015 Mount Polley accident report into its operations.

General Questions

70. The Commission asked about the current condition of the Cluff Lake site. CNSC staff responded that the site has been dewatered and re-vegetated with a dry cover system that has been placed over the tailings. The tailings underneath the cover are akin to solid ground since the cover, though not impermeable, is designed to allow precipitation to run off of it. The AREVA representative added that the precipitation that runs off of the cover is continuously monitored to ensure that it is free of contaminants.

71. The Commission enquired about the nature of the above-ground TMFs at Key Lake and Rabbit Lake in comparison with the Cluff Lake site. CNSC staff responded that the Key Lake and Rabbit Lake sites do not presently have covers on them, and therefore any snow melt or precipitation that accumulates on the tailings is collected and treated. Cameco provided the Commission with details on how the water collection and treatment is performed. CNSC staff assured the Commission that the consolidated tailings at all three above-ground TMFs are compacted and do not have the high water content of a tailings slurry, such as that at Mount Polley, and that they would therefore not flow readily.

72. The Commission asked whether any remediation of the Key Lake and Rabbit Lake above-ground TMFs has been performed. The Cameco representative stated that since those sites are being currently used for waste disposal, no reclamation activities have been started. The Cameco representative assured the Commission that Cameco was committed to site remediation and is focused on performing remediation in areas that have been identified as priorities for these activities.

73. The Commission expressed its satisfaction that both CNSC staff and the licensees were planning to incorporate lessons learned from the events at Mount Polley into their regulatory and operational processes, and enquired whether any lessons learned could be shared at the present time. CNSC staff stated that it is confident in the rigorous compliance oversight that it provides and added that lessons learned for the CNSC will be finalized and implemented after the January 2015 accident report from the Mount Polley accident is released.

74. The Commission enquired whether the licensees had instrumentation in the TMFs to monitor any movement in embankments. The Cameco representative responded that they have vibrating wire piezometers in TMF embankments from which data is continuously collected and monitored. The Cameco representative also assured the Commission that due to the consolidated nature of the tailings, the risk associated with the facilities is very low.

75. The Commission asked whether any major structural deficiencies have been found during inspections at uranium TMFs. CNSC staff responded that there have not, mostly due to the fact that the CNSC maintains strict regulatory oversight of the facilities, from design to operation and decommissioning.

76. The Commission enquired about the results of the third party geotechnical inspections that are conducted at the above-ground TMFs. CNSC staff responded that, in general, any noted issues

during these inspections are related to facility care and maintenance, and that CNSC staff ensures that licensees follow up with all recommendations. CNSC staff added that these inspections are valuable because they ensure that licensees are active in maintaining the TMFs, and that the geotechnical experts have the expertise and knowledge to adequately evaluate the safety and security of TMFs.

77. The Commission requested more information about the frequency of inspections at TMFs. CNSC staff responded that active sites such as Key Lake and Rabbit Lake undergo more frequent inspections than decommissioned sites such as Cluff Lake. However, all sites are inspected as required by their licence conditions. The Commission noted that there appears to be adequate regulatory oversight over the TMFs.

CNSC Staff Update on Cameco Corporation's Decommissioned Beaverlodge Mine and Mill Site

78. With reference to CMD 14-M60 and CMD 14-M60.A, CNSC staff presented an update on Cameco Corporation's decommissioned Beaverlodge mine and mill site. At the May 2013 hearing, during which Cameco was issued a 10-year licence to proceed with remediation and management of the Beaverlodge properties, CNSC staff committed to updating the Commission on performance objectives and indicators, as well as timeline estimates for the transfer of each property at the site into the Province of Saskatchewan's Institutional Control Program (institutional control). CNSC staff noted that environmental protection standards have improved considerably since the 1980s, and that the work that Cameco is currently performing includes enhancements and improvements to the decommissioning originally done at the Beaverlodge site.

Comments by Licensee's Representatives

79. The Cameco representative stated that although the Beaverlodge site was left physically stable and in a safe condition in 1985, Cameco is committed to ensuring the long-term safety, security and stability of the decommissioned properties for their eventual transfer into institutional control.

General Questions

80. The Commission requested more information about the surface subsidence in the Lower Ace Creek area. CNSC staff responded that mine drawings confirmed that the subsidence is related to the thinning of a surface crown pillar of a historical mining drift. The Cameco representative added that the crown pillar was determined

to be approximately 5 meters thick, that Cameco performed appropriate remediation of the surface subsidence in 2013 and 2014, and that the risk to the public is low since access to the site is restricted. The Cameco representative further stated that a stability assessment is being performed on all of the crown pillars at the Beaverlodge site.

81. The Commission enquired about the gamma surveys that are being performed at the Beaverlodge site and the dose rate objective for their release into institutional control and for public use. CNSC staff responded that since CMD 14-M60 was written, the CNSC and the province of Saskatchewan have agreed to a dose rate objective of one microsievert per hour, averaged over one hectare, and provided the Commission with additional information about this objective. The SMOE representative concurred with this dose rate objective. The Commission further enquired about the background radiation levels in the area. The Cameco representative responded that the background radiation gamma survey has yet to be completed, but assured the Commission that the decommissioned Beaverlodge properties pose little radiological risk to the public.

82. The Commission enquired about the safety of traditional country foods in the areas surrounding the Beaverlodge site. The Northern Saskatchewan MHO responded that although there is a fishing advisory due to elevated selenium levels in Beaverlodge Lake and Martin Lake, it is strictly a “limiting of consumption” advisory rather than a “do-not-eat” advisory. The Northern Saskatchewan MHO representative added that the EARMP showed that it was safe for residents of the Uranium City area to consume traditional country foods.

83. The Commission asked for more information about the predicted concentration of uranium in the bodies of water at the Beaverlodge site. CNSC staff responded that the criteria for acceptance into institutional control consider whether the bodies of water are stable and improving, rather than their end state. As such, there is no defined target for uranium concentration, since the bodies of water at the site are expected to recover.

84. The Commission enquired about Beaverlodge properties that have already been moved to institutional control. CNSC staff responded that those properties are relatively small, were surveyed prior to transfer, and were deemed to pose no unreasonable risk to persons or the environment.

85. The Commission expressed its satisfaction with the project timeline tables presented in CMD 14-M60, and asked Cameco whether the timelines proposed for the Beaverlodge project were

reasonable and what were perceived to be the key challenges or risks for the project. The Cameco representative stated that they are confident in meeting the timelines as outlined, but exemption from licensing and acceptance into institutional control are ultimately decisions made by the CNSC and the province of Saskatchewan. CNSC staff added that both the CNSC and the province of Saskatchewan have accepted the project timelines. The Commission requested annual performance updates to ensure that targets are met.

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86. The Commission requested confirmation that all necessary financing is in place to ensure completion of the Beaverlodge project. The representative from the Saskatchewan Ministry of the Economy responded that all necessary financing is in place.

Overview of the 6th Review Meeting of the Convention on Nuclear Safety

87. With reference to CMD 14-M64, CNSC staff presented an overview of its participation during the 6th Review Meeting of the Convention on Nuclear Safety (CNS). CNSC staff described the three objectives of the CNS and noted that while there is no inherent enforcement mechanism to ensure Contracting Party (CP) compliance, their obligations are detailed in the Articles of the Convention. CNSC staff also described the self-assessment and learning activities in which they engaged before and during the CNS Review Meeting, and Canada's role in ensuring the safety and security of the global nuclear power industry. The CNSC is currently the only nuclear regulator that is actively disclosing the outcome of the CNS Review Meeting to the public and the Commission, demonstrating its commitment to regulatory transparency.

88. The Commission asked about the level of involvement by other countries in the CNS Review Meetings, and whether these meetings have encouraged positive changes to their regulatory programs. CNSC staff responded that although five countries did not attend the meeting, and multiple countries did not ask questions or submit reports for the meeting, countries that have mature nuclear power plant (NPP) regulatory programs challenged each other quite extensively. CNSC staff further noted that since nuclear safety is a global challenge, the President of the CNS is contacting countries who did not conform to CNS requirements and advising them of their obligations.

89. The Commission enquired about the nature of the reports submitted by countries that have emerging nuclear regulatory programs. CNSC staff responded that many of the countries who did not submit a report or make a presentation stated that they were in the process of establishing a nuclear regulatory program or were having challenges in establishing a regulatory regime.

90. The Commission enquired about the trend with respect to the level of engagement from CPs over the previous five CNS Review Meetings. CNSC staff responded that the CNS was established shortly after the Chernobyl accident and that at that time, CPs were very concerned with lessons learned, NPP safety and improvements. While this concern lessened slightly over the years, the Fukushima Daiichi accident in 2011 brought about renewed global concern about NPP safety and many post-Fukushima enhancements have been made to NPPs worldwide. CNSC staff added that during the 6th CNS Review Meeting, Canada took the lead in challenging the CPs who were not demonstrating the same level of commitment to safety and fulfilling their obligations to the CNS. CNSC staff concluded that the trend of closure of the challenges presented to CPs is progressing, but there is still work to be done.

91. The Commission noted that the challenges that were established for Canada at the Review Meeting appeared to be similar to the projects that the CNSC had already undertaken. CNSC staff confirmed that many of the challenges arising from the Review Meeting include challenges that the Commission had identified, and additional details about these challenges were presented. CNSC staff added that through this presentation to the Commission, it is publicly disclosing these challenges and its commitment to report on them. The Commission further enquired whether CNSC staff's approach to addressing these challenges changed after the Review Meeting. CNSC staff responded that discussions with other CPs during the Review Meeting established lessons learned and validated CNSC staff's approach to addressing the challenges.

92. The Commission asked which organizations other than the CNSC were involved in the preparation of the Canadian report for the Review Meeting. CNSC staff responded that, although the CNSC is the lead for the CNS report and its submission, the CNS delegation and contributors to the report included Health Canada, the Department of Foreign Affairs, Trade and Development, Natural Resources Canada, as well as nuclear industry representatives.

93. The Commission enquired about the proposed changes to Article 18[3] of the CNS. CNSC staff responded that while they supported the principle behind the proposed change, the method to achieve it must be carefully evaluated. The Commission stated that a principal concern with the proposed change to Article 18 is that it would create two classes of NPPs (old and new). A Diplomatic Conference planned for January 2015 will discuss this issue

[3] https://www.iaea.org/Publications/Documents/Infcircs/Others/inf449.shtml

further. The Commission further enquired about whether the amendment to Article 18 covers continuous improvement or whether this is covered in other articles of the CNS. CNSC staff responded that continuous enhancement and review is part of the other articles and the guidelines of the CNS.

94. The Commission asked about how decisions with respect to CNS Articles, guidelines, and CP challenges are made. CNSC staff responded that CPs must obtain consensus with respect to any decisions that are made and provided details on how consensus is reached during country group and plenary sessions. The Commission further enquired whether non-compliance from CPs occurs. CNSC staff responded that it is expected that when consensus is reached, CPs will comply with the CNS.

95. The Commission enquired whether nuclear industry participants had any comments on or concerns about the CNS. The OPG representative stated that OPG considers participation in the CNS a good practice for Canada and other countries. The OPG representative further stated that the challenging questions raised by other countries, which may have different experiences, provide a good critical review of OPG's safety program. The Bruce Power representative concurred with the OPG representative, and added that the nuclear industry has learned that its mistakes are felt globally, and Bruce Power therefore takes every opportunity to participate in these forums.

96. The Commission asked whether Canada is the only country that includes members of the nuclear industry in its CNS delegation. CNSC staff responded that although Canada was the first to do this, Russia, France, the United States and several other countries are now including members of the nuclear industry in their delegations.

97. The Commission enquired how CNSC staff will address the Review Meeting challenges that involve multiple provincial and national jurisdictions, such as emergency preparedness and post-accident management. CNSC staff responded that they will be engaging all of the stakeholders while addressing these challenges. CNSC staff noted, however, that the intent of the challenges is to establish CNSC regulatory requirements for the licensees and stakeholders, to fulfill the needs of the Commission and public safety, and to ensure that the stakeholders are executing these requirements appropriately. The Commission further enquired about whether a consensus was reached between CPs on best practices with respect to multi-jurisdictional challenges. CNSC staff responded that while CPs have reached a consensus on best practices, which have been published, these best practices and their implementation may be modified to allow for a CP's specific

requirements. The Commission noted that most countries have multiple regulators for various industries and that only a general consensus, rather than a precise consensus, can be reached.

98. The Commission asked whether CNSC staff have identified challenges other than the six challenges that were given to Canada at the Review Meeting. CNSC staff responded that while the challenges that Canada has been given are adequate, CNSC staff operates in a state of continuous improvement and as such does not consider this to be an all-inclusive list. CNSC staff provided the Commission the details of additional initiatives on which CNSC staff will be working in the coming months to enhance the CNSC's capacity as a regulator.

99. The Commission enquired about the discrepancies found between the IAEA Integrated Regulatory Review Service (IRRS) reports and the CP's reports. CNSC staff responded that discrepancies were most often found with respect to self-reporting. To encourage transparency in reporting, CNSC staff suggested that CPs include IRRS findings in their reports and that reviewers verify IRRS findings as part of their review.

Update on CNSC Staff Review of a New Neutron Overpower Protection Methodology

100. With reference to CMD 14-M50, CNSC staff presented the fifth progress report on the development of a new Neutron Overpower Protection (NOP) methodology, Enhanced-NOP (E-NOP). CNSC staff provided the Commission with a summary of its conclusions as of April 2013 and the current status of the E-NOP methodology review by CNSC staff. CNSC staff assured the Commission that the currently installed trip set points are acceptable and will ensure that the reactors operate safely until August 2017. CNSC staff will provide the Commission with further progress updates in the next NPP annual report.

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101. The Commission enquired whether the requirement for an alternate NOP methodology also applies to the Point Lepreau nuclear generating station (NGS). CNSC staff responded that since the Point Lepreau NGS was recently refurbished, they do not have the same heat transport system aging issues as the Bruce, Pickering and Darlington NGS, and can use the original design NOP methodology.

102. The Commission requested more information about reactor derating at the Point Lepreau NGS prior to refurbishment, and the potential derating of aging reactors. CNSC staff responded that derating at the Point Lepreau NGS varied between 90 and 93 percent of full power. Bruce, Pickering and Darlington NGS will

continue to operate at full power until such time that it is no longer conservatively safe to do so.

103. The Commission asked whether this extended review of the E-NOP methodology indicates that CNSC staff has concerns about its validity. CNSC staff responded that the project was initiated approximately 10 years ago, and that although the methodology has gone through multiple iterations, CNSC staff still has concerns regarding its validity for licensing applications. CNSC staff further explained that the original design NOP methodology is currently being used because it provides an adequate safety margin for three years. The OPG representative responded that the E-NOP methodology has been extensively and independently reviewed, is technically sound and superior to the original methodology. Licensees have been working with CNSC staff to improve the E-NOP methodology and to address questions about its application. The OPG representative further stated that a meeting with CNSC staff is scheduled at the end of October 2014 and that OPG anticipates being able to address many of the concerns that CNSC staff has expressed. The Bruce Power representative stated that Bruce Power believes the E-NOP methodology is ready to use and is accurate, and anticipates being able to provide the justification and the safety criteria to support its use at a meeting with CNSC staff at the end of October 2014. The Commission indicated that it expects a definitive decision on the future of the E-NOP methodology to be made soon, and that the status of the acceptance of the E-NOP methodology should be more clearly defined after the October 2014 meeting between CNSC staff and licensee representatives.

104. The Commission enquired about the gap between the installed trip set points and the set points predicted by the E-NOP methodology. CNSC staff responded that for the Darlington NGS, the Unit 2 installed trip set point is very close to the E-NOP predicted trip set point. However, Pickering and Bruce NGS have significant margins between the installed and predicted set points. CNSC staff added that while modifying trip set points is an important aspect of the aging management strategy, it is not the only strategy being used.

105. The Commission asked whether developing an alternative to the E-NOP trip set point methodology is an option. CNSC staff indicated that although the possibility has been discussed, it is not a feasible option due to time constraints. The Bruce Power representative stated that Bruce Power believes that the safety case for the E-NOP methodology can be justified, and that although some minor changes may have to be made to how it is applied, the methodology is technically sound.

106. The Commission enquired whether the E-NOP methodology would still be required if the Darlington and Bruce NGS are refurbished. The Bruce Power representative indicated that it would not be required when the refurbishment is complete. CNSC staff added that since refurbishment can take up to 10 years, a modified trip set point methodology is going to be required within three years, when the trip set points become so low that derating the reactors may become necessary. The Commission further enquired how long refurbished reactors can use original design trip set points. CNSC staff stated that original design trip set points can be used for decades after refurbishment, and provided details on when the alternate trip set point methodologies become necessary.

107. The Commission asked for information on whether the E-NOP methodology improves reactor safety. CNSC staff responded that the safety criteria for any trip set point methodology are to prevent fuel dry-out and to ensure that the shutdown systems are effective. CNSC staff added that over-conservative trip set points can cause the reactor to trip due to normal flux spikes, and that excessive reactor trips can have a negative effect on the reactor and operational safety. The Bruce Power representative also clarified that although NOP is an important reactor trip parameter, it is not the only safety parameter.

108. The Commission enquired about whether the changing trip set points could lead to reactors being refurbished earlier. CNSC staff responded that refurbishment is a business decision for the licensees and that the primary concern of CNSC staff is ensuring the safety of reactors and of the aging-management solutions adopted by licensees. The Bruce Power representative noted that the heat transport systems are not likely to be a life-limiting issue in the reactors and that the new 37M fuel design is intended to help offset the effects of an aging heat transport system.

109. The Commission enquired about the limitations that were encountered through E-NOP methodology benchmarking tests. CNSC staff described the benchmarking tests that were performed and stated that they were statistical analyses, not physical analyses. Although the results were statistically and mathematically sound, they do not represent the reality of a reactor, and that more complex benchmarking tests involving a physical analysis are still being developed. The Commission enquired whether the uncertainties involved in the statistical modelling of the E-NOP methodology have contributed to the concerns that CNSC staff have about its validity. CNSC staff responded that these uncertainties, also known as paradoxes, are a definite concern for CNSC staff and that these paradoxes must be explained prior to the validation of the E-NOP methodology. CNSC staff provided the Commission with a summary of the paradoxes that have been encountered.

110. The Commission asked for more information on reactor shutdown systems. The Bruce Power representative responded that there is a very rigorous testing program and that specific reliability targets need to be met for the shutdown systems. Individual parameters can be tested within the shutdown systems, and testing can be performed while the reactor is operating.

111. The Commission enquired about past loss of regulation (LOR) events in Canada. CNSC staff responded that in the early 1970s, multiple LORs occurred due to the limitations of the initial design of the reactor regulating system. Since that time, the reactor regulating systems have been significantly improved and the Canadian Standards Association target for total failure of the reactor regulating system is 1 in 100 years. CNSC staff added that an LOR event occurred at Darlington Unit 2 in 2011[4] and at the Bruce NGS in 2005. The Bruce Power representative noted that the 2005 event was determined not to be an LOR event, and described this event. The only LOR at the Bruce NGS was in 1992.[5]

112. The Commission expressed its satisfaction for a very clear presentation of this highly technical topic.

Technical Briefing on the Seismic Safety of Canadian Nuclear Power Plants and the National Research Universal Reactor

113. With reference to CMD 14-M65, CNSC staff presented its technical briefing on the *Seismic Safety of Canadian Nuclear Power Plants and the National Research Universal Reactor*. The presentation provided insight into CNSC staff overview and assessment of the major Canadian licensed nuclear facilities with respect to seismic safety. The fundamentals of seismic engineering, evolution of the seismic safety requirements in Canada and in the world, the earthquake-related Fukushima action items that have been undertaken, new initiatives envisioned to improve the seismic safety of Canadian nuclear power plants, as well as CNSC staff outreach and international cooperation, were discussed.

114. The Commission asked why there is a shift from deterministic to probabilistic seismic margin assessments (SMA). CNSC staff responded that although deterministic assessments are still considered acceptable and within appropriate standards, they are considered to have weaknesses, and therefore, licensees are encouraged to move away from these types of assessments. CNSC staff also provided details on the strengths and weaknesses of deterministic and probabilistic SMAs.

[4] On October 24, 2014, OPG provided a memo to the Commission indicating that although an adjuster rod drove out of the core of a reactor at the Darlington NGS in April 2010, the CNSC and OPG determined that it was not an LOR event.
[5] Bruce Power provided a memo to the Commission on October 7, 2014 describing the 2005 event, which was not an LOR event.

115. The Commission asked which fraction of the equipment described in the presentation was installed at the beginning of operations. CNSC staff responded that most of the equipment shown (which is in existing CANDU NPPs) was installed during construction, except for some upgrading that was done over time. CNSC staff added that the seismic supports are part of a licensee's regular inspection program.

116. The Commission suggested that the presentation be published on the CNSC website, after making modifications to render it more accessible to the public.

117. The Commission asked for comments on statements from members of the public that the likelihood of severe earthquakes has increased because of climate change or fracking. CNSC staff explained that the scientific community in North America is in the process of reviewing earthquake related scientific information which CNSC staff will use it in its assessments. CNSC staff also noted that, in a previous hearing, Natural Resources Canada explained that fracking activities would induce earthquakes up to a maximum of level 5, which are low magnitudes earthquakes and that nuclear power plants have been constructed to withstand such earthquakes. CNSC staff is also arranging for a review by the IAEA on CNSC activities related to site seismic hazard assessments.

118. The Commission enquired about review-level earthquakes. CNSC staff responded that a review-level earthquake is a benchmarking earthquake. A deterministic value of peak ground acceleration (PGA) of 0.3g or a probabilistic value of 1 in 10,000 years could be used. The Commission further enquired on the value of PGA that could cause core damage and release. CNSC staff explained that the preferred assessment approach is to determine a value where safe shutdown of the plant can be done. This corresponds to the probability of a 1 in 10,000 years earthquake (which, in Central-East North America, roughly corresponds to a 0.3g PGA). The probabilistic safety assessment for the plant will cover scenarios, consequences and responses for a number of incidents by identifying all main contributors to the probabilistic safety goals.

Closure of the Public Meeting

119. The meeting closed at 1:13 pm.

Recording Secretary — Date: 2014-11-06.

Recording Secretary — Date: 2014-11-06

Secretary — Date: 2014-11-06

APPENDIX A

CMD DATE File No

14-M57 2014-09-03 Edocs #4497794
Notice of Meeting of October 1 and 2, 2014

14-M61 2014-09-18 Edocs #4509122
Agenda of the meeting of the Canadian Nuclear Safety Commission to be held on Wednesday and Thursday, October 1 and 2, 2014, in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario

14-M61.A 2014-09-25 Edocs #4514530
Revised agenda of the meeting of the Canadian Nuclear Safety Commission to be held on Wednesday and Thursday, October 1 and 2, 2014, in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario

14-M62 2014-09-26 Edocs #4520918
Approval of Minutes of Commission Meeting held August 20 and 21, 2014

14-M59 2014-08-11 Edocs #4470860
CNSC Staff Report on the Performance of Uranium and Nuclear Substance Processing Facilities: 2013

14-M59.A 2014-09-24 Edocs #4500723
CNSC Staff Report on the Performance of Uranium and Nuclear Substance Processing Facilities: 2013 – Oral presentation by CNSC staff

14-M59.1 2014-09-03 Edocs #4499122
CNSC Staff Report on the Performance of Uranium and Nuclear Substance Processing Facilities: 2013 – Written submission from Lou Rinaldi, M.P.P,, Northumberland-Quinte West

14-M59.2 2014-09-05 Edocs #4499133
CNSC Staff Report on the Performance of Uranium and Nuclear Substance Processing Facilities: 2013 – Written submission from the Municipality of Port Hope

14-M59.3 2014-09-24 Edocs #4518807
CNSC Staff Report on the Performance of Uranium and Nuclear Substance Processing Facilities: 2013 – Oral presentation from Nordion (Canada) Inc.

14-M58 2014-08-11 Edocs #4457301
CNSC Staff Report on the Performance of Uranium Mine and Mill Facilities: 2013

14-M58.A 2014-09-24 Edocs #4500660
CNSC Staff Report on the Performance of Uranium Mine and Mill Facilities: 2013 – Oral presentation by CNSC staff

14-M58.1 2014-09-06 Edocs #4500457
CNSC Staff Report on the Performance of Uranium Mine and Mill Facilities: 2013 – Written submission from Corina Psarrou-Rae

14-M58.2 2014-09-12 Edocs #4504301
CNSC Staff Report on the Performance of Uranium Mine and Mill Facilities: 2013 – Written submission from the English River First Nation

14-M60 2014-09-16 Edocs #4491123
CNSC Staff Update on Cameco Corporation's Decommissioned Beaverlodge Mine and Mill Site

14-M60.A 2014-09-24 Edocs #4500498
CNSC Staff Update on Cameco Corporation's Decommissioned Beaverlodge Mine and Mill Site – Oral presentation by CNSC staff

14-M66 2014-09-30 Edocs #4516884
CNSC Staff Update Regarding Mount Polley Tailings Dam Breach – Oral presentation by CNSC staff

14-M63 2014-09-29 Edocs #4523860
Status Report on Power Reactors as of September 29, 2014

14-M64 2014-09-16 Edocs #4503426
Overview of the 6th Review Meeting of the Convention on Nuclear Safety

14-M64.A 2014-09-24 Edocs #4508745
Overview of the 6th Review Meeting of the Convention on Nuclear Safety – Oral presentation by CNSC staff

14-M50 2014-09-16 Edocs #4482704
Fifth Progress Report on the CNSC Staff Review of a new Neutron Overpower Protection (NOP) Methodology

14-M50.A 2014-09-24 Edocs #4504661
Fifth Progress Report on the CNSC Staff Review of a new Neutron Overpower Protection (NOP) Methodology – Oral presentation by CNSC staff

14-M65 2014-09-24 Edocs #4511844
Technical Briefing: Seismic Safety of the Canadian Nuclear Power Plants and the National Research Universal Reactor – Oral presentation by CNSC staff