Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting Held on November 8, 2018

November 8, 2018

Minutes of the Canadian Nuclear Safety Commission (CNSC) meeting held Thursday, November 8, 2018, beginning at 9:01 a.m., in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, ON.

Present:

R. Velshi, President
M. Lacroix
K. Penney
T. Berube

K. McGee, Assistant Secretary
L. Thiele, Senior General Counsel
C. Moreau, Recording Secretary

CNSC staff advisors were: R. Jammal, P. Elder, G. Frappier, C. Purvis, E. Lemoine, S. Karkour, N. Riendeau, K. Glenn, L. Sigouin, K. Sauvé, A. Viktorov, B. Gracie, J. Burta, R. Richardson, L. Hunter, C. Cole, M. Gerrish, A. McAllister, C. Cianci, S. Yalaoui, Y.C. Liu, Y. Poirier, G. Latouche and B. Romanelli

Other contributors were:

- Bruce Power: L. Clewett, G. Newman, J. Scongack and M. Burton
- Ontario Power Generation: S. Smith, I. Malek, B. Duncan, G. Rose, L. Morton, E. Schwartz and R. McCalla
- Hydro-Québec: D. Olivier
- Énergie NB Power: M. Power, K. Ward, K. Duguay and N. Reicker
- Office of the Fire Marshal and Emergency Management: D. Nodwell
- New Brunswick Emergency Management Office: R. Shepard
- Fisheries and Oceans Canada: J. Thomas

Constitution

1. With the notice of meeting CMD 18-M56 having been properly given and a quorum of permanent Commission members being present, the meeting was declared to be properly constituted.

2. Since the meeting of the Commission held October 3-4, 2018, Commission member documents (CMD) 18-M39, 18-M57 and 18-M58 were distributed to members. These documents are further detailed in Appendix A of these minutes.

Adoption of the Agenda

3. The agenda, CMD 18-M57, was adopted as presented.

Chair and Secretary

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

Minutes of the CNSC Meeting Held October 3-4, 2018

5. It was indicated that the minutes of the October 3-4, 2018 Commission meeting would be presented to the Commission for their approval at the December 12-13, 2018 Commission meeting.

STATUS REPORTS

Status Report on Power Reactors

6. With reference to CMD 18-M58, which provides the Status Report on Power Reactors (Status Report), CNSC staff provided the following updates:

   - Bruce Nuclear Generating Station (NGS) Unit 4 had returned to service on October 31, 2018 following a forced outage to repair a leaking valve in the reactor regulating system.
   - the Darlington NGS Unit 2 refurbishment program was transitioning to fuel channel installation after the completion of the calandria tube installation.
   - Pickering NGS Units 1 and 7 were derated to 98% and 93% respectively, due to fuelling machine unavailability.
   - New Brunswick Power (NB Power) will submit an event report to the CNSC in accordance with REGDOC-3.1.1, *Reporting Requirements for Nuclear Power Plants*[1] concerning a heavy water spill inside the reactor building on November 5, 2018 which resulted in a higher than normal tritium level in air. CNSC staff informed the Commission that NB Power took appropriate actions in response to the spill, that there were no releases to the environment, no significant uptakes by workers, and added that CNSC staff would perform a review of that event following NB Power's submission of the event report.

[1] CNSC Regulatory Document, REGDOC-3.1.1, *Reporting Requirements for Nuclear Power Plants*, Version 2, April 2016.

7. The Commission asked for information about an injury that occurred on October 15, 2018 at the Bruce NGS. The Bruce Power representative explained that a welder received an electrical shock while working on a boiler, causing him to hit his head. The Bruce Power representative added that the individual was released from the hospital the same night, that he would return to work with full duties within approximately one week and provided the Commission with information about additional actions with regard to pre-job welding safety that had since been implemented.

8. Regarding the unavailability of the fuelling machine at the Pickering NGS Unit 1, the Commission requested additional details about the issue and the anticipated return to service date. The OPG representative explained that the issue appeared to be an intermittent ground fault and that, although the reactor was currently being fuelled from only one direction, OPG expected the issue to be resolved on November 8, 2018. The OPG representative acknowledged the difficulties that OPG had encountered with fuelling machine reliability at the Pickering NGS and stated that OPG had plans focussed on the improvement of the fuelling machines' reliability and added that, due to the age of the fuelling machines, many parts were no longer available on the market and that reverse engineering was needed to get new parts.

9. Asked to provide information on the nature of the leak tests performed following the Darlington NGS Unit 2 calandria tube installation, the OPG representative reported that leak tests were performed on each end of the calandria tube to make sure that the rolled joints were not leaking. The OPG representative added that all calandria tubes had been successfully tested, with the exception of one site, due to inaccessibility with the testing tool. The OPG representative noted that OPG had a plan to resolve the issue with the testing tool and to test that last site in the near future.

10. Concerning an ankle fracture event on October 10, 2018 at the Bruce NGS, the Commission enquired about the lessons learned from the incident and whether the employee had returned to work. The Bruce Power representative reported that the employee was back at work on restricted duty and that Bruce Power provided the individual with personal coaching in respect of awareness of surroundings, with lessons learned from the event provided to all Bruce NGS staff.

11. Addressing the Digital Control Computer (DCC) event at the Pickering NGS Unit 4, the OPG representative explained to the Commission that the individual who incorrectly pressed the "STOP/STALL" push button on the DCC was an authorized nuclear operator and that, following the event, the individual was required to undergo a remediation program to ensure that he had appropriate knowledge to carry out this function properly. The OPG representative added that a supervisor or another qualified person had to be present when authorized nuclear operators were doing reactor control panel manipulations to ensure adequate oversight of such operations. CNSC staff confirmed that OPG's corrective actions were adequate.

12. Further on the DCC incident, the OPG representative explained to the Commission that the Pickering NGS DCCs were designed to be as simple as possible, with one pushbutton that could shut down the reactor, noting that control room panels also had buttons which would shut a reactor down when pressed. The OPG representative further explained that the authorized nuclear operators were trained to know how and when to carry out their job duties and that peer oversight was required to prevent events such as this one. The Commission is satisfied with the information provided in this update, and therefore the Commission closes Action Item #14315.

ACTION
Closed

13. The Commission requested details about, and the tritium levels following, the heavy water spill at the Point Lepreau NGS on November 5, 2018. The NB Power representative reported that the spill involved was less than 10 liters of heavy water from the heat transport system and that the tritium concentrations in the area of the spill were measured at a maximum of 2,700 microsieverts (µSv) per hour, compared with 10-20 µSv per hour during normal operations. The Commission noted that NB Power would provide at a later date the tritium concentration in the heavy water at the time of the event.

ACTION
Closed

INFORMATION ITEM

Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2017

14. With reference to CMD 18-M39, CNSC staff presented to the

Commission the annual Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2017 (the ROR). CNSC staff highlighted the safety ratings for NGS across all safety and control areas (SCA), as well as the industry average ratings. CNSC staff also reported on compliance verification activities carried out at NGS during 2017, and provided an overview of the event initial reports (EIR) submitted to the Commission during 2017. The report also encompassed the safety performance and regulatory developments of the waste management facilities (WMF) co-located on NGS sites.

15. Key results and findings reported in the ROR included:
    - radiation doses to members of the public and to the workers were well below regulatory limits;
    - no radiological releases to the environment exceeded regulatory limits;
    - the frequency and severity of non-radiological injuries to workers were very low;
    - the Canadian NGS and WMF safety performance ratings for 2017 were "satisfactory" or "fully satisfactory".

16. The public was invited to comment on the ROR through written interventions. Six interventions were received. Through the CNSC's Participant Funding Program (PFP), participant funding in the amount of $11,920 was granted to two intervenors:
    • Gordon Dalzell
    • Canadian Environmental Law Association

Comments from Canadian NGS Licensees

17. Representatives from Canadian NGS licensees were invited by the Commission to submit their comments regarding the performance ratings presented in the ROR. The OPG representative commented that OPG was pleased with the safety performance of its facilities in 2017, as noted by the "fully satisfactory" overall rating for both the Pickering and the Darlington NGS.

18. The NB Power representative stated that NB Power welcomed the findings as presented in the 2017 ROR and stated that NB Power considered them as part of the Point Lepreau NGS continuous improvement process. The NB Power representative added that conventional, radiological

and environmental safety was the priority for NB Power. The NB Power representative also reported that NB Power was working on improving the equipment readiness and modernizing the Point Lepreau NGS with the latest codes, standards and regulations.

19. The Bruce Power representative explained Bruce Power's core value of "safety first" which included reactor safety, radiation safety, environmental safety and industrial safety. The Bruce Power representative also mentioned continuous improvement initiatives in place at the Bruce NGS as well as Bruce Power's innovations to improve safety, employee training and public engagement.

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

21. The Commission expressed its satisfaction with the 2017 ROR and the inclusion of the WMFs in this document. The Commission suggested minor corrections to CNSC staff that should be made prior to final publication.

Unsolicited e-mail to CNSC President – October 30, 2018

22. The President noted for the record an unsolicited correspondence to the President, received by email on October 30th, 2018, from Dr. F. Greening respecting the February 2018 internal alpha contamination event that occurred at the Darlington NGS Refurbishment Retube Waste Processing Building.[2] The President emphasized that it would have been preferable to follow the Commission's formal interventions process to seek to intervene in these proceedings on this issue as the interventions process is the appropriate, fair and transparent way to bring matters to the Commission. However, due to the safety significant nature of the alpha contamination event and the issues raised in the email, the Commission provided specific direction to OPG in regard to addressing the issues that were raised in it. The President on behalf of the Commission also directed CNSC staff to consider the issues raised in the e-mail and to review OPG's

[2] Canadian Nuclear Safety Commission, *Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting Held on 14 March 15, 2018*.

work carried out in this regard, with a view to updating the Commission on its assessment. The Commission agrees to close Action Item #14051 "Darlington NGS Refurbishment Internal Contamination Event" and opens Action Item #15076 to address the potentially safety significant issues, numbered (i) through (xiv), raised in the email.

ACTION by June 2019 Action Item #15076

23. The Commission further directed that the unsolicited email be entered into the record for these proceedings, be provided to all Commission Members, OPG and CNSC staff, and made available publicly.[3]

Interventions

Canadian Nuclear Workers' Council and Power Workers' Union

24. With reference to the written submission from the Canadian Nuclear Workers' Council (CMD 18-M39.1), the Commission asked about whether there were any unionized employees at the Gentilly-2 NGS. The Hydro-Québec representative explained that unionized employees worked at the Gentilly-2 NGS but that they were members of a different union, primarily the Syndicat canadien de la fonction publique (Canadian Union of Public Employees). Asked about whether these unionized employees were able to participate in health and safety committees at the facility, the Hydro-Québec representative responded that all unions and employees at the Gentilly-2 NGS were able to participate in health and safety committees and provided details about how this participation was facilitated by Hydro-Québec.

25. With reference to the written submission from the Power Workers' Union (CMD 18-M39.2), the Commission requested an update on the implementation of random alcohol and drug testing at Canadian NGS sites in accordance with REGDOC-2.2.4, *Fitness for Duty, Volume II, Managing Alcohol and Drug Use*, Version 2.[4] CNSC staff explained that all aspects of REGDOC-2.2.4 would be implemented by all NGS licensees by July 2019, with the exception of random testing that would be implemented by December 2019. CNSC staff added that, during the comprehensive public consultation for REGDOC-2.2.4, unions had expressed support for the

[3] After the public Meeting, the Commission redacted the correspondence to remove personal information and opinions, and made it available as CMD 18-M39.7.
[4] CNSC Regulatory Document, REGDOC-2.2.4, *Fitness for Duty Volume II: Managing Alcohol and Drug Use*, Version 2, December, 2017.

broad fitness for duty provisions in the REGDOC, but expressed opposition to random drug testing.

SOS Great Lakes

26. With reference to the written submission from SOS Great Lakes (CMD 18-M39.3), the Commission enquired about severe accident recovery assessments in the event of a multiple emergency scenario at the Bruce NGS. The Bruce Power representative informed the Commission that Bruce Power had a robust emergency preparedness program through which it was ready to deal with an all-hazards type of scenario. The Bruce Power representative also stated that Bruce Power had updated its severe accident management guidelines (SAMGs) to include parallel unit issues or multiunit conditions and that the Emergency Management Centre Team was ready to deal with an all-hazards type of scenario. CNSC staff reported that CNSC staff encouraged the licensees to exercise their SAMGs during emergency exercises. CNSC staff added that it was satisfied that Bruce Power met all the severe accident management licensing requirements.

27. Upon request for comment about SOS Great Lakes assertion that Bruce Power underreported events and releases at the Bruce NGS, the Bruce Power representative submitted that Bruce Power was compliant with the regulatory reporting requirements, noting that all events were reported to the Commission as required and proactively posted on the Bruce Power corporate website. The Bruce Power representative confirmed to the Commission that Bruce Power was willing to communicate with any groups or members of the public that would like additional information about its operations. CNSC staff explained that disclosure specifications for licensees were specified in RD/GD-99.3, *Public Information and Disclosure*[5] and that CNSC staff's inspections and assessments had not shown that Bruce Power was underreporting events at the Bruce NGS. CNSC staff also noted that the CNSC's communications staff liaised with Bruce Power in regard to public reporting of any event that may be of interest to the public and that Bruce Power was meeting the specifications of RD/GD-99.3.

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

28. The Commission considered the concerns expressed by SOS Great Lakes about active contamination from outlets from the Bruce NGS and enquired whether such environmental monitoring data was available to the public. The Bruce Power representative stated that information about active contamination were available on Bruce Power's website in the annual radiation monitoring program report that was submitted to the CNSC on a yearly basis. CNSC staff added that the Independent Environmental Monitoring Program (IEMP) data were also publicly available and that environmental monitoring did not show high levels of radioactive contamination in the Bruce area.

29. In regard of the SOS Great Lakes' comment that members of the public may not be drinking municipal water around the Bruce NGS because of fear of contamination, the Commission asked for information on how the public could access monitoring information for reassurance in this regard. The Bruce Power representative stated that concerns with drinking water had not been communicated to Bruce Power. The Bruce Power representative added that Bruce Power monitored the water quality near two municipal water intakes and that the results were reported to the municipalities. The Bruce Power representative suggested that Bruce Power could reach out to the intervenor to discuss this matter. CNSC staff confirmed that Bruce Power's environmental monitoring results and the CNSC IEMP showed that drinking water near the Bruce NGS remained safe. The Commission is satisfied in this regard and directs Bruce Power to communicate with SOS Great Lakes in an effort to address the intervenor's concerns about drinking water in the vicinity of the Bruce NGS.

30. Further considering the intervention from SOS Great Lakes, the Commission enquired about the respective responsibilities of Bruce Power, the municipalities and the province, in terms of safety and emergency management outside of the Bruce NGS site. The Bruce Power representative explained that, although there was a legal delineation between on-site responsibilities of Bruce Power and the off-site responsibilities of other organizations, these jurisdictional boundaries did not limit collaboration and cooperation between Bruce Power, the municipalities and the province in terms of emergency preparedness. The Bruce Power representative added that Bruce Power supported the municipalities with training and many other community support initiatives. CNSC staff noted that the province and

local communities were responsible for safety outside of a licensee site's boundary. CNSC staff added that licensees were required to collaborate with the province and the local communities on safety and emergency related matters.

Canadian Environmental Law Association

31. With reference to the written submission from the Canadian Environmental Law Association (CELA) (CMD 18-M39.5), the President stated that information submitted by CELA regarding improvements to public participation at Commission proceedings had been reviewed and considered by the Commission and that the Commission was of the view that all intervenors in these proceedings were treated fairly and without bias. In this vein, the Commission reiterates its commitment to ensuring meaningful public participation during public Commission hearings and meetings and this topic will be considered in conjunction with the improvement of RORs. This Commission meeting was to consider the 2017 ROR and not Commission process issues.

32. The Commission asked for information on the KI Working Group that was proposed by CNSC staff and agreed to by the Commission during the 2018 Pickering NGS licence renewal hearing.[6] CNSC staff explained that reaching agreement on the terms of reference of the working group was a collaborative process between the working group's members and indicated that the delay was not related to waiting for the issuance of the detailed *Record of Decision* for the Pickering licence renewal. CNSC staff added that the terms of reference of the KI Working Group would be available for public consultation and that there was discussion of the creation of an advisory committee to allow for the participation of interested parties and to engage stakeholders. Asked about the publication of KI Working Group meeting minutes, CNSC staff also indicated that the working group would be responsible to make the decision with respect to the publication of the minutes of their meetings based on the confidentiality of the information discussed.

33. Noting the issues raised by CELA about planning for the protection of drinking water in the event of an accident, the Commission asked CNSC staff to clarify jurisdictional

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

responsibilities in this regard. CNSC staff indicated that the protection of drinking water was a provincial responsibility. The Office of the Fire Marshal and Emergency Management of Ontario (OFMEM) representative described the role and responsibilities of the different agencies that would be involved in this regard and the measures to be implemented in case of an emergency. The Provincial Nuclear Preparedness representative in New Brunswick informed the Commission that, in case of nuclear emergency, restrictions on water and food consumption would be implemented by responsible provincial departments until the provincial technical advisory group sampled them and determined the safe way ahead.

34. Further on the subject of the protection of drinking water, the OFMEM representative explained that having contingency plans for every possible emergency scenario was not feasible and that the OFMEM preferred to have a robust decision-making system and the capability to deal with issues and resource needs for every situation. The OFMEM representative explained how this decision-making system was recently implemented to help supply Texas with drinking water during Hurricane Harvey in 2017.

35. In relation to the management of municipal water treatment plants during a nuclear emergency, the OFMEM representative gave a summary of the roles and responsibilities of the different provincial entities, including the Medical Officer of Health, the Community Emergency Management Coordinator, Municipal Works Department as well as the Ministry of the Environment, Conservation and Parks.

G. Dalzell

36. With reference to the written submission from G. Dalzell (CMD 18-M39.4), the Commission asked about whether the information presented by NGS licensees during open houses was made publicly available on the licensees' website. The Bruce Power representative reported that it was Bruce Power's practice to post online everything that was made available at the open houses. The OPG representative stated that OPG was posting a significant amount of information online but added that there were opportunities to make some information easier to access, as indicated by the intervenor. The NB Power representative commented that NB Power did have a lot of information on its website and that information

presented during information sessions was also distributed through newsletters. The Hydro-Québec representative submitted that information about activities at Gentilly-2 was available on the company's website and that Hydro-Québec was planning to add hyperlinks to several news reports.

37. The Commission asked Canadian NGS licensees to comment on community liaison committees and the posting of the committees' meeting minutes on licensees' websites. The OPG representative informed the Commission that community advisory councils were in place for the Pickering NGS and the Darlington NGS and that the minutes of the meetings were posted online. The Bruce Power representative described how Bruce Power was using the communities existing channels to disseminate information to the public. The Hydro-Québec representative described Hydro-Québec's approach with the municipality of Bécancour and the Waban-Aki council and added that the minutes of those meetings were publicly available. The NB Power representative described how NB Power interacted with the public and the community relation liaison group and added that NB Power would post the minutes of the community relation liaison group's meetings on NB Power's website.

38. Noting the concerns about climate change impacts on NGS raised in the intervention from G. Dalzell, the Commission enquired about how climate change was addressed in CNSC regulatory processes. CNSC staff explained that climate change effects would be captured through the environmental risk assessments that licensees are required to perform every five years. CNSC staff added that the CNSC had a memorandum of understanding with Environment and Climate Change Canada (ECCC) to work together in this regard and added that CNSC staff also participated in international and national groups associated with climate change.

39. The Commission enquired about whether there were any lessons learned after the process safety failure at an oil refinery in New Brunswick in October 2018 that could be applicable to the nuclear industry. CNSC staff stated that communications to the public during and after an accident were important to reduce the stress caused by major accident. CNSC staff also indicated that the provincial authorities had a process in place to share information between each other, including after action reports on real emergencies as well as information on nuclear and other emergency exercises. CNSC

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staff proposed, and the Commission agreed, for CNSC staff to come back to the Commission and explain how the process of information sharing was implemented.

40. Further on this topic, the NB Power representative indicated that, due to the small size of the population in New Brunswick, many of the same authorities that would respond to a nuclear emergency at the Point Lepreau NGS were also involved during other natural disasters and industrial accidents. The NB Power representative added that NB Power was awaiting the after action review from the oil refinery accident and the follow-up provincial level assessment.

41. Asked about exceedance of hours of work for certified staff at the Bruce NGS as raised in the intervention from G. Dalzell, the Bruce Power representative stated that the most common causes for exceedances of hours worked at the Bruce NGS were severe weather in the wintertime and certified staff illnesses. The Bruce Power representative added that individuals were monitored very closely for fitness for duty until they could be replaced by other certified staff. The Bruce Power representative further added that Bruce Power was working to increase the number of certified staff at the Bruce NGS to reach Bruce Power's target of zero for hours of work exceedances.

42. The Commission enquired about the activities at the Gentilly-2 NGS that resulted in a higher dose to the public in 2017 as compared to previous years. The Hydro-Québec representative explained that the higher public dose was due to the transfer of spent resin to the waste storage facility. The Hydro-Québec representative added that even with those planned releases, the dose to the public remained very low.

Dr. S. Greer

43. With reference to the written submission from Dr. S. Greer (CMD 18-M39.6), the Commission asked for information regarding the projected emissions or discharges tracking by isotope from the proposed OPG deep geologic repository (DGR) at the Bruce NGS site. The OPG representative explained that the DGR waste inventory report detailed radionuclide by isotope and added that scaling factors can be used to estimate particular radionuclides. The OPG representative also noted that this topic had been discussed at length in the DGR Joint Review Panel public hearings in

2014.[7] CNSC staff emphasized that this issue was considered extensively during the DGR Joint Panel Review hearings and was of the view that a large body of information in this regard existed and was publicly available.

General Questions

44. Explaining the purpose of the IEMP, CNSC staff reported that the licensees had a comprehensive set of environmental monitoring requirements and that the purpose of the IEMP was not to replace the licensees' environmental monitoring program; rather, the IEMP confirmed that the environment outside the NGS site remained protected. CNSC staff added that the International Atomic Energy Agency suggested that it was a good practice for nuclear regulators to have an IEMP.[8] Industry representatives concurred with CNSC staff on this issue, stating that the IEMP increased the confidence of the local population.

45. The Commission asked whether the IEMP could lower the motivation of the licensees to exceed environmental requirements. CNSC staff emphasized that CNSC staff would not provide a recommendation to the Commission to issue a licence if CNSC staff's assessment did not determine that the licensees' activities were protective of the environment. The Bruce Power representative explained that the Environmental Health Index was part of Bruce Power's continuous improvement plan. The OPG representative indicated that to be able to operate in the community, OPG had to gain the trust of the community and that lowering environmental impacts and the public dose were two primary considerations for OPG. The NB Power representative informed the Commission that NB Power completed the process of updating its ISO 14001-certified Environmental Management System to the latest standards and was committed to the protection of the environment, noting the specific importance of ensuring that the Bay of Fundy remained a safe source of food.

46. In response to the Commission enquiry about industry targets for conventional health and safety, the Bruce Power, OPG and

[7] Canadian Environmental Assessment Agency, *Joint Review Panel Environmental Assessment Report – Deep Geologic Repository for Low and Intermediate Level Radioactive Waste Project*, CEAA Reference No. 17520, 6 May 2015.
[8] IAEA Safety Standards, *Environmental and Source Monitoring for Purposes of Radiation Protection*, RS-G-1.8, 2005.

Hydro-Québec representatives provided the injury rate used internally by their own company.

47. Noting the Commission's comments about the different conventional health and safety metrics used in the ROR, CNSC staff noted that there were different ways of reporting on conventional health and safety and that CNSC staff will explore how its reporting on these performance indicators could be made more consistent in future RORs.

48. Asked for an update on whole-site Probabilistic Safety Assessment (PSA), CNSC staff noted that, as required by the Commission, Pickering NGS completed a whole-site PSA in 2017 and that Bruce Power was planning to present CNSC staff with its methodology for a whole-site PSA by the end of 2018. CNSC staff also described international whole-site PSA projects and indicated that different methodologies were used internationally.

49. The Commission enquired about the radiation protection SCA at Darlington, as it was the only SCA where performance had declined in 2017. The OPG representative presented that one of the reasons for the lower performance was an event where OPG did not maintain adequate control of motors shipped offsite for refurbishment with undetected internal contamination. The OPG representative added that corrective actions, including modifications to procedure and training adjustments, were put in place to resolve the issue. CNSC staff noted that the shipment procedures were adequately revised, but added that enhanced oversights would be in place until OPG could demonstrate to CNSC staff's satisfaction that its workers were adequately protected. The OPG representative discussed other challenges encountered at the Darlington NGS, such as the refurbishment project and the increased number of on-site workers.

50. In regard to the higher number of shift supervisors employed at the Darlington NGS compared to the Pickering and Bruce NGS, the OPG representative explained to the Commission that this was in part due to the graduation of two shift supervisor classes around the same time and that OPG planned to have extra shift supervisors to help with the work on the refurbishment project.

51. The Commission enquired about the reason for the difference in the World Association of Nuclear Operators (WANO) industry performance target for unplanned emergency

shutdowns between boiling water reactors (BWR) and pressurized heavy water reactors (PHWR), noting that it was double for PHWRs. CNSC staff indicated to the Commission that it did not have detailed information on this issue but would come back to the Commission and provide an answer at a later time. The Commission is satisfied in this regard.

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By
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52. Upon request for information on the preventive maintenance completion ratio, CNSC staff explained that the preventive maintenance completion ratio calculation was based on the total completed preventive maintenance work against the total completed preventive maintenance work plus corrective maintenance. CNSC staff stated that a ratio of 80% was considered satisfactory. CNSC staff added that the Equipment Reliability Index used by the industry was not an index that CNSC staff was using from a safety perspective.

53. The Commission enquired about why the Point Lepreau NGS action limit was set at 1% of the DRLs for effluents and emissions while those for other NGSs were set at 10%. CNSC staff informed the Commission that NB Power had requested the implementation of the 1% action level at the Point Lepreau NGS and noted that the other NGSs' action levels would also decrease after the implementation of CSA Standard N288.8[9] in the next few years. The NB Power representative stated that Point Lepreau requested to set a more restrictive action level to better represent the current emission levels.

54. Responding to the Commission's enquiry about increased security at used fuel dry storage facilities, CNSC staff explained that some storage facilities had expanded their protected area and that other storage facilities were planning to expand their protected area. CNSC staff also stated that improvements to equipment and procedures had been made to dry storage facilities to align their practices with those in place at NGS.

55. The Commission asked for an update on the follow-up for the IAEA Operational Safety Review Team (OSART) mission which evaluated the Pickering NGS operational safety performance against IAEA safety standards performed in 2016. The OPG representative informed the Commission that the follow-up visit from the OSART occurred in September

[9] N288.8, *Establishing and implementing action levels for releases to the environment from nuclear facilities*, CSA group, 2017.

2018 and that the team concluded that OPG had a strong commitment to, and made tremendous effort in, addressing all the findings. The OPG representative added that the report would be published shortly and that it would be available on the IAEA website. The OPG representative further added that there was no other OSART mission planned in the near future.

56. The Commission asked for the reason for not having an agreement between the CNSC and the Government of Quebec in respect of conventional health and safety. CNSC staff explained that although there was no formal agreement in place, CNSC staff can interact with the Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST) in Quebec. CNSC staff further added that memoranda of understanding (MOU) were in place between the CNSC and the provincial conventional health and safety organizations in Ontario and in New Brunswick.

57. The Commission sought an explanation of the type of emergency that could occur at a facility undergoing decommissioning, such as Gentilly-2, and the kind of emergency response that would be supported by the facility and the provincial government. The Hydro-Québec representative submitted that the previous emergency plan was abolished in 2016 based on the reduced risks related to Gentilly-2 and that the remaining risks were related to the cooling of the used fuel bay. The Hydro-Québec representative added that a local emergency plan related to the current risks was still in place. CNSC staff concurred that emergency plans for Gentilly-2 were now included in the overall Hydro-Québec emergency plan for their facilities, given the current condition and risks. CNSC staff added that the ROR would be revised to reflect this information.

58. Commenting on the status of the pressure tube fracture toughness model, the Bruce Power representative informed the Commission that the testing plan in place was on schedule. The Bruce Power representative added that Bruce Power was providing information to CNSC staff on the progress of this project and that Bruce Power was working closely with OPG on that program.

59. The Commission enquired about the fuel bundle vibration issue at the Bruce B NGS. The Bruce Power representative indicated that the problem affected 24 pairs of fuel channels, out of the 480 fuel channels in the Bruce B NGS units and

explained that the pulsation created by the pump impellers in the primary heat transport system resulted in endplate cracking due to an acoustic excitation of the fuel strings.

60. Asked about the total recordable injury frequency (TRIF) and whether the performance indicator included data on contractors, the OPG, Bruce Power and NB Power representatives told the Commission that the TRIF was also recorded for contractors and that data were available. The Hydro-Québec representative indicated that the TRIF numbers did not presently include contractors' data but that it would be easily accessible due to the small number of contractors at the Gentilly-2 NGS. The Commission expects CNSC staff to report the TRIF that included contractors data in future ROR.

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61. Commenting on the emergency power generator 3 (EPG 3) installation at the Darlington NGS, the OPG representative notified the Commission that the EPG 3 installation was a safety improvement opportunity that OPG undertook to improve the reliability of the emergency power systems. The OPG representative added that the principal reason for the EPG 3 installation was that EPG 1 and EPG 2 were approaching end of life and would require replacement.

62. Asked for clarification about a non-routine bioassay non-compliance at the Darlington NGS, the OPG representative explained to the Commission the difference between a routine and a non-routine bioassay. The OPG representative further explained that, although some non-compliances in this regard had been found, the overall dose to the workers was still accurate and that OPG had put a process in place to ensure future compliance.

63. Regarding the Commission enquiry on the residual heat of used fuel bundles when they come out of a reactor and after seven years in the used fuel bay, the Hydro-Québec representative indicated that Hydro-Québec would provide the Commission with the values at a future date. The Commission anticipates information in the near future in this regard via memo.

ACTION
By
December 2018

64. The Commission enquired about the modifications to the electrical power and instrumentation and control systems of the Gentilly-2's used fuel bays that were implemented to ensure reliability. The Hydro-Québec representative explained that the modifications were made to simplify the

systems to better reflect the risk associated with decommissioning the NGS.

65. Upon request by the Commission for an update of the thermal plume assessment at the Point Lepreau NGS, the NB Power representative indicated that NB Power was performing a full analysis of the thermal discharge from the Point Lepreau NGS condenser cooling water system with a third party consultant. The NB Power representative added that the assessment results were also used to perform a risk assessment for the species within the intertidal boundary. CNSC staff confirmed NB Power's information and added that the Point Lepreau NGS deep water intake, as well as the diffuser on the discharge pipe, was less disruptive for the environment than previously used technology.

66. The Commission asked for an update concerning the *Fisheries Act*[10] authorization application by NB Power. The NB Power representative stated that NB Power reviewed the comments on the draft submission from CNSC staff and added that NB Power was working with Indigenous groups, stakeholders and the local community leaders to have all the information to satisfy all requirements in respect of its *Fisheries Act* authorization application for the Point Lepreau NGS. CNSC confirmed the information provided by NB Power and noted that CNSC staff had been working with NB Power as well as with Fisheries and Oceans Canada under an MOU to undertake the technical reviews of NB Power's draft application.

67. Asked for comments on *Fisheries Act* authorizations at NGS, the DFO representative presented that the Darlington NGS had an existing *Fisheries Act* authorization and that OPG had been sending their monitoring reports as required to the DFO. The DFO representative added that OPG also had a *Fisheries Act* authorization for the Pickering NGS and that DFO was expecting an application from Bruce Power.

68. On the issue of corrective maintenance backlogs at the Pickering NGS, the OPG representative indicated some inconsistencies with the data presented in the ROR, that OPG focused on reducing its corrective maintenance backlog and that the corrective maintenance backlog was at zero at the end of 2017 and currently at only 2 corrective maintenance backlogs. The OPG representative added that OPG's focus

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

was now on improving the deficient corrective backlog. CNSC staff presented that the Pickering NGS was rated as satisfactory in this specific area reflecting OPG's efforts to improve maintenance backlogs. The Commission expects CNSC staff to update the corrective maintenance backlog data with the appropriate data.

ACTION
By
January 2019

Refurbishment

69. Addressing the issue of the storage of the waste generated during NGS refurbishment projects, CNSC staff informed the Commission that the extra volume of waste from refurbishment was assessed during CNSC staff reviews of refurbishment projects, and also during licensing of WMFs. CNSC staff added that there were sufficient provisions in place through the current licences and LCHs to manage the volume of waste that would be generated by refurbishment activities. CNSC staff further added that OPG's proposed DGR also accounted for future volumes of this refurbishment waste.

70. The Commission asked OPG for additional information on progress of the Darlington refurbishment project. The OPG representative presented that the project was on schedule and on budget, and that the collective radiation exposure was better than the target. The OPG representative provided an overview of the refurbishment project divided into four pillars: safety, quality, schedule and cost. The OPG representative added that the refurbishment of the Darlington NGS Unit 2 was 69% complete, with a targeted completion date of November 2020. The OPG representative added that OPG was planning to start the refurbishment of Unit 3 one to two months following the completion of the refurbishment of Unit 2, that midway through the refurbishment of Unit 3 OPG would start the refurbishment of Unit 1, and when the refurbishment of Unit 3 was completed, OPG would start the refurbishment of Unit 4. CNSC staff added that a refurbishment update would be presented at the Commission meeting in February 2019.

71. Upon request for a comparison between the Darlington NGS refurbishment and completed refurbishment activities in South Korea, the OPG representative explained to the Commission that the Korean refurbishment was a successful project and, for this reason, OPG was benchmarking its schedule and work progress against the Korean

refurbishments. The OPG representative noted, however, that it was difficult to do benchmarking in terms of safety and costs due to regulatory differences between the Canadian and the Korean regulatory environments.

72. The Commission enquired about skilled trades availability for the Darlington NGS refurbishment project. The OPG representative indicated that OPG collaborated with Bruce Power on skilled trades availability and described the efforts made by the industry to attract new employees into the trades. The OPG representative added that approximately 4,000 people had worked on the Darlington NGS refurbishment project to date.

Waste Management

73. The Commission asked for information about the medium safety significance inspection finding in the waste management SCA for the Darlington NGS, related to a decision to stop source surveillance at the manufacturing level. The OPG representative gave details about the finding associated with the verification of manufacturers' quality assurance (QA) requirements and how it was corrected. The OPG representative added that OPG used a change management committee to implement the required changes to governance. The OPG representative indicated that OPG reinstituted source surveillance at the manufacturers for the dry storage containers. The OPG representative added that the revision of the already installed dry storage containers' QA history dockets was near completion and that a submission concerning this review would be provided to CNSC staff by the end of January 2019.

74. The Commission enquired about the options that were being considered for long-term solutions of the low and intermediate level waste from the Point Lepreau and Gentilly-2 NGSs. The NB Power representative noted that Point Lepreau had adequate room for the low-level waste until the end of life of the station and that NB Power was continuing to work on a solution for long-term storage of the intermediate-level waste. The Hydro-Québec representative explained that there was enough temporary storage capacity at the Gentilly-2 NGS and added that Hydro-Québec was working with the industry to find a long-term solution for the waste disposal. The OPG representative explained that industry efforts were focusing on the two owner operators that

had the largest volumes of waste, OPG and Canadian Nuclear Laboratories Inc.

75. The Commission asked for clarification about the SOx and NOx stack exceedances at the WWMF. The OPG representative informed the Commission that NOx and SOx were created through the low-level waste incineration process. The OPG representative added that an error in the continuous emissions monitor software had caused the problem, and that the error had since been corrected.

76. The Commission asked for the reason why the Western Waste Management Facility (WWMF) had its own derived release limits while the Pickering WMF and Darlington WMF did not. The OPG representative explained that the WWMF was a standalone facility and that the Pickering and Darlington WMFs' DRLs were included into the overall DRL for the entire NGS sites, which included both the NGS as well as the WMFs.

77. In relation to the ROR for Canadian Nuclear Power Generating Sites, the Commission was satisfied with the information provided and closed the following Actions Items, tracked in the CNSC Regulatory Information Bank:
    - Action Item 14050 (Failure of Bruce NGS Unit 4 PHT Pump Seals)
    - Action Item 12728 (Clarification of Terminology)
    - Action Item 12727 (Status of OPG's Public Disclosure of Contaminants
    - Action Item 12616 (Emergency Management Updates from Exercise Unified Control and the 2017 OAG Report)
    - Action Item 11805 (NB Power PLNGS Corrective Actions)

    The following Action Item remained OPEN:
    - Action Item 8504 (Establishment of Proposed Regulatory Position on Risk Aggregation)

Closure of the Public Meeting

78. The meeting closed at 16:10 p.m.

Recording Secretary

JAN 2 8 2019
Date

Secretary

JAN 2 8 2019
Date

November 8, 2018

APPENDIX A

CMD	Date	e-Docs No.
18-M56	2018-10-04	5635744
Notice of Commission Meeting		
18-M57	2018-10-23	5636239
Agenda of the Meeting of the Canadian Nuclear Safety Commission (CNSC) to be held on Thursday, November 8, 2018, in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario		
18-M58	2018-10-31	5690430
Status Report on Power Reactors Submission from CNSC Staff		
18-M39	2018-09-06	5628442
Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2017 Submission from CNSC Staff		
18-M39.A	2018-11-01	5690942
Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2017 Submission from CNSC Staff – supplemental		
18-M39.B	2018-11-02	5690989
Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2017 Presentation from CNSC Staff - supplemental		
18-M39.1	2018-10-09	5653065
Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2017 Submission from the Canadian Nuclear Workers' Council		
18-M39.2	2018-10-09	5653089
Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2017 Submission from the Power Workers' Union		
18-M39.3	2018-10-09	5653109
Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2017 Submission from SOS Great Lakes		
18-M39.4	2018-10-11	5655074
Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2017 Submission from Gordon W. Dalzell		
18-M39.5	2018-10-15	5659357
Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2017 Submission from the Canadian Environmental Law Association		

November 8, 2018

CMD	Date	e-Docs No.
18-M39.6	2018-10-15	5669577
Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2017 Submission from Sandy Greer		
18-M39.7	2018-10-30	5733089
Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2017 Email from Frank Greening		