Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting Held on February 20, 2019

February 20, 2019

Minutes of the Canadian Nuclear Safety Commission (CNSC) meeting held Wednesday, February 20, 2019, beginning at 9:02 a.m., in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, ON.

Present:

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

M. Leblanc, Commission Secretary
L. Thiele, Senior General Counsel

C. Moreau and P. McNelles, Recording Secretaries

CNSC staff advisors were: R. Jammal, H. Tadros, C. Moses, G. Frappier, C. Purvis, N. Riendeau, R. Richardson, K. Murthy, K. Heppell-Masys, L. Ethier, A. Mathai, K. Hazelton, D. Reinholz, N. Babcock, R. Tennant, D. Moroz and M. Kent

Other contributors were:

- Ontario Power Generation: R. Manley, E. Schwartz, M. Duarte, R. McCalla, S. Gregoris, D. Reiner and G. Rose
- Bruce Power: M. Burton
- Canadian Nuclear Laboratories: S. Parnell, P. Boyle and A. Mahabir
- Canadian Border Services Agency: B. Illson-Skinner

Constitution

1. With the notice of meeting Commission Member Document (CMD) 19-M1 having been properly given and all permanent Commission members being present, the meeting was declared to be properly constituted.

2. Since the meeting of the Commission held December 12 and 13, 2018, CMDs 19-M1 to 19-M10 were distributed to members. These documents are further detailed in Appendix A of these minutes.

Adoption of the Agenda

3. The agenda, CMD 19-M2, was adopted as presented.

Chair and Secretary

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

Minutes of the CNSC Meeting Held November 8, 2018

5. The Commission members approved the minutes of the November 8, 2018 Commission meeting secretarially in January 2019.

Minutes of the CNSC Meeting Held December 12 and 13, 2018

6. The Commission members corrected paragraph 130 of the minutes of the December 12 and 13, 2018 Commission meeting as presented in CMD 19-M3, to stipulate that it was two (and not three) of the SRBT on-site monitoring wells that were above the Ontario drinking water guidelines for tritium. After making this correction, the Commission approved the December 2018 minutes.

UPDATES ON ITEMS FROM PREVIOUS COMMISSION PROCEEDINGS

Request to the Municipality of Port Hope and Canadian Nuclear Laboratories for the Publication of Radiological Survey Results Conducted in Port Hope

7. With reference to CMD 19-M8, CNSC staff provided an update on its facilitation of the publication of radiological survey results in the Port Hope area, as considered in the August 2018 Commission meeting[1] and in Commission Action Item #14780. During the August 2018 Commission meeting, the Commission expressed concerns that the Port Hope area radiation survey results could only be obtained via the *Access to Information Act*[2] and CNSC staff had agreed to work with the Canadian Nuclear Laboratories Ltd. (CNL) and the Municipality of Port Hope (MPH) to make these results more accessible to the public. In its submission, CNSC staff indicated to the Commission that it was satisfied that CNL and the MPH were working collaboratively to disclose municipal property survey results to the public, and that CNL had improved its processes with respect to the public

[1] *Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held on August 22 and 23, 2018*, paragraphs 92-93.
[2] R.S.C., 1985, c. A-1

disclosure of the radiation survey results. CNSC staff noted that it would monitor, through its regulatory oversight, CNL's continued communication with the public in this regard. CNSC staff recommended that this Action Item be closed.

8. The Commission requested further details on how members of the public would access the survey results without making an access to information request. The CNL representative informed the Commission that if a request was received, the MPH would be notified and CNL would provide a summary of the results to the requestor within two weeks. The CNL representative further stated that, if the requestor made an additional request for the detailed report, it would be provided within four weeks, noting that the time required to provide documents depended on the amount of data that had to be redacted for sensitivity or privacy reasons.

9. Responding to an enquiry about the differences between the content in the summary report and the detailed report, the CNL representative informed the Commission that the detailed report would include all data collected from the four tests that were conducted: radon, interior gamma, exterior gamma, and borehole sampling. The CNL representative added that the detailed report would also explain how the results were analyzed and how the determination of the presence of historic low-level waste was made, whereas the summary report would only state whether historic low-level waste was found and, if so, in what location(s).

10. Further on this topic, the CNL representative clarified that an information request would not be required to access the municipal survey results and that CNL would offer to have a CNL specialist meet with the requestor to explain the detailed technical information.

11. The Commission asked if CNL's website was clear in that both the summary and detailed municipal survey reports could be requested. The CNL representative responded that the website did not differentiate between the reports, however, if a request was made, CNL would inform the requestor about the option to receive both reports. CNSC staff added that the public CNSC website would point to the CNL website to facilitate requests for the reports.

12. Addressing the number of requests made for the survey reports, the CNL representative stated that CNL had received one request for the survey of a property, seven road allowance survey requests, and was tracking other requests. The CNL

representative added that it would provide the road allowance reports to the requesters once the final reports were available.

13. The Commission asked whether these radiological survey result reports would be provided to tenants as well as property owners. The CNL representative responded that. if a tenant requested a survey report for a private property, CNL would inform the owner, provide the report to the owner and tenant(s), and provide additional information about the report to the requester(s), as needed.

14. The Commission was satisfied with the information provided by CNL and CNSC staff on this matter, and closed Action Item #14780. **ACTION** #14780 Closed

Update to the Darlington Nuclear Generating Station Alpha Event

15. With reference to CMD 19-M7.1, OPG provided the Commission with its response to each of the 14 questions raised in the e-mail[3] sent to the Commission in October 2018 regarding the February 6, 2018 alpha contamination event at the Darlington Retube Waste Processing Building (RWPB).[4,5] OPG included four enclosures in its submission in order to support its responses and to provide the Commission with additional information regarding radiological source term characterization, contamination sample smears and smear analysis, and a dose assessment report. OPG provided these responses as directed by the Commission during the November 2018 Commission Meeting, described in Action Item #15076.[6]

16. With reference to CMD 19-M7, CNSC staff provided its technical review and assessment of OPG's response to the 14 questions that were raised in the October 2018 e-mail. In its assessment, CNSC staff noted areas for improvement in the execution in OPG's radiation protection program that had been identified during a prior inspection and that were also referenced in a December 13, 2018 section 12(2) request under the *General Nuclear Safety and Control Regulations* (GNSCR)[7] issued to

[3] CNSC CMD 18-M39.7, *E-mail from Dr. Frank Greening filed on October 30 2018*, October 30, 2018.
[4] CNSC Event Initial Report (EIR) – CMD 18-M14, *Darlington Refurbishment – Retube Waste Processing Building – Internal Contamination Event*, March, 2018
[5] *Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held on March 15, 2018*, paragraphs 25-31.
[6] *Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held on November 8, 2018*, paragraphs 21-23.
[7] SOR/2000-202

OPG. CNSC staff explained that it would continue to do compliance verification activities to ensure that OPG implemented the necessary corrective actions and would continue to provide updates to the Commission on the implementation of those corrective actions. CNSC staff provided the view that OPG had adequately addressed the 14 questions raised in the October 30, 2018 email and that no additional regulatory actions were necessary in that regard. CNSC staff recommended that Action Item #15076 be closed.

17. The Commission enquired about the differences in the presence and activity of certain radionuclides, such as iron-55, between the samples taken on February 20, 2018 and on December 6, 2018, as detailed in OPG's submission. The OPG representative informed the Commission that the samples were taken at different locations and on different pieces of equipment, so some variation was understandable; however, this variation was not likely due to radioactive decay. The OPG representative stated that OPG would verify that iron-55 was surveyed, and would report any further results back to CNSC staff and the Commission. The Commission expects OPG to follow up in this regard via memo when this information becomes available.[8]

18. The Commission requested further details regarding the use of particle sizing measurements in dose estimates and assessments. The OPG representative stated that particle sizing was used in dosimetry assessments; however, it was not routinely performed and would typically be done only if OPG were using a new technology or undertaking a new type of work. The OPG representative provided a hypothetical situation to the Commission to illustrate the use of particle sizing measurements, in which there was the possibility of a large dose, with particle sizing performed on aerosol samples to obtain the most accurate dose estimate prior to undertaking the work and assigning personal protective equipment (PPE). The OPG representative noted that a larger particle size could result in a smaller assigned dose because of the ability of PPE to protect the worker from intake. CNSC staff stated that OPG's analysis used a conservative particle size in its assessments and demonstrated a very low dose, therefore CNSC staff was satisfied that OPG was not required to perform a particle size analysis.

[8] On March 14, 2019, OPG submitted a memo via the Secretariat providing Commission members with the requested details. This memo has been filed on the record for this Commission meeting as CMD 19-M7.1A, *Darlington Nuclear Generation Station: Update on Alpha Contamination Event Supplementary Submission from Ontario Power Generation (responses filed after the meeting)* and is available for download on the CNSC website.

19. The Commission enquired about the risk assessment and dose projection methodologies used by OPG when performing NGS refurbishment work. The OPG representative provided the Commission with a detailed overview of that process, stating that it would start with the development of a radiation protection plan using historical data and operating experience, with validation of the assumptions through radiation characterization surveys, and revision of the plan based on the survey results to ensure that radiation doses were in line with the As Low As Reasonably Achievable (ALARA) principle. The OPG representative provided details about OPG's ALARA controls, including the use of appropriate PPE, dosimetry requirements, contamination monitoring, back-out conditions and contingency plans. The OPG representative added that the radiation protection plan would be adjusted, and corrective actions would be performed as necessary.

20. The Commission asked if this risk assessment would inform OPG's selection of PPE. The OPG representative confirmed that the choice of PPE would be determined based on the anticipated hazards as determined by the risk assessment. The OPG representative stated that the default PPE used would be plastic suits, however OPG may employ alternate PPE based on the assessed risk of work being performed. The OPG representative added that, in certain cases, such as those involving an area with radioactive particles or significant gamma exposure, there may not be any suitable PPE to adequately protect workers and robots would be utilized instead.

21. The Commission noted that this contamination event at the Darlington RWPB had occurred when there was an unanticipated change in working conditions and the correct PPE was not used. The Commission enquired if OPG had tracked and implemented the lessons learned from this event. The OPG representative informed the Commission that OPG had applied the lessons learned from this event to its work and practices in the Unit 2 refurbishment project. The OPG representative provided several examples in this regard, including improvements to worker proficiency, training programs, oversight of work activities and the OPG monitoring program, adding that OPG would also include these lessons learned as part of its planning and preparations for the refurbishment activities of other units.

22. The Commission requested clarification regarding the minimum detectable activity (MDA) of alpha particulates in airborne emissions, as discussed in question (xii) of CMD 19-M7.1. The

OPG representative stated that, prior to April 2017, the MDA value of 100 mBq had been used by OPG and the actual emissions for a reactor unit were calculated as the MDA plus the flow rate, resulting in the overall reported emissions from each reactor unit. The OPG representative added that after April 2017, OPG decreased the MDA value to 6.7 mBq due to improvements in detection technology, with the actual emissions calculated in the same way as prior to April 2017. The OPG representative reported that an assessment that was submitted to CNSC staff in 2005 showed that the alpha emissions at the Pickering and Darlington NGS were negligible and therefore there was no requirement to routinely monitor those emissions.

23. The Commission requested clarification regarding the sum of the activity of all the radionuclides detected in the smear samples taken from the RWPB, as detailed in OPG's submission. The OPG representative informed the Commission that it did not have this detailed information and would follow up with this information after the Commission meeting. The OPG representative noted, however, that the lab performing the analyses was accredited and had a good quality assurance program, which gave OPG the confidence that the analyses were correct. The Commission anticipates that OPG will provide it with this information via memo.[9]

24. Addressing questions about the particular focus regarding curium radioisotopes in OPG's submission, the OPG representative explained to the Commission that curium radioisotopes were the primary alpha-emitting radionuclide of interest with respect to dosimetry and potential dose consequences. The OPG representative added that there were specific questions related to curium radioisotopes and, as such, OPG had endeavoured to provide complete responses to those questions. The Commission further asked about the presence of plutonium radioisotopes in work areas at the RWPB. The OPG representative responded that several radioisotopes of plutonium were detected and identified, however they were not the dominant alpha emitter.

25. The Commission enquired about the procedures used by OPG to take the alpha samples for analysis. The OPG representative explained the sampling procedure, whereby the worker would trace out an area using a sampling disc to ensure that the sample provided the proper representation of the equipment or area. The OPG representative stated that the exact area or piece of

[9] *Ibid.*

equipment to be sampled would be determined during a pre-work briefing.

26. The Commission expressed its appreciation for the thoroughness and transparency of OPG's work and responses in this matter. The Commission was satisfied with the information provided by OPG and CNSC staff on this matter and closed Action Item #15076.

ACTION
#15076
Closed

STATUS REPORT ON POWER REACTORS

27. With reference to CMD 19-M4, which provides the status report on power reactors, CNSC staff provided an updated to the Commission that Pickering NGS Unit 1 had returned to full power.

Darlington NGS Low Alpha Activity Detected on Personal Air Samplers

28. The Commission made reference to the detection of alpha particle activity in personal air samplers used by workers at the Darlington NGS in November 2018, as discussed at the December 2018 Commission meeting.[10] The Commission enquired about the competitive risks between sustained gamma doses and the worst-case scenario of alpha doses. The OPG representative first provided comparisons of protection and control measures for gamma hazards, whereby monitoring equipment and alarms were mostly used, and beta (tritium) hazards, where PPE provides substantial protection. The OPG representative informed the Commission that a low-dose alpha alarm did not exist on the market but alarming instrumentation that could detect large alpha fields was used to protect workers. The OPG representative further explained that the data from the alpha monitors and personal air samplers showed that, in general, the alpha field was of low activity and that a small, localized area of higher activity was responsible for the event in November 2018. The OPG representative added that those alpha results also proved to be of very low dose consequence.

29. The Commission asked CNSC staff about its assessment regarding the potential for a worst-case alpha exposure scenario, as well as the means by which to mitigate such an issue. CNSC staff responded that, although OPG had an adequate radiation

[10] CNSC CMD 18-M63, *Status Report on Power Reactors*, December 13, 2018.

protection (RP) program in place, CNSC staff continued to have some concerns regarding OPG's execution of that program and noted that this concern led to the issuance of the GNSCR section 12(2) request in December 2018. Further in regard to the Darlington NGS Unit 2 refurbishment work, CNSC staff stated that OPG was expected to continuously revise and validate risk characterization and expected hazards as the work progressed, and that existing controls were working as intended. CNSC staff also informed the Commission that risk characterization and operating experience informed RP monitoring and protective measures, and noted that NGS licensees had improved their RP programs to provide for the increased detection and monitoring of alpha hazards.

30. Further on this issue, CNSC staff informed the Commission that, although there was always the expectation that high levels of alpha radiation could occur during certain aspects of the refurbishment work, appropriate PPE would prevent a worker from receiving a high dose. CNSC staff stressed the importance of its regulatory oversight and that, following the two alpha events, CNSC staff had increased oversight activities of OPG's RP program implementation.

31. The OPG representative expressed confidence that OPG had appropriate controls in place to ensure that its workers would not receive a dose that was greater than the regulatory limit, and provided details about these controls. The OPG representative informed the Commission that OPG had performed similar replacement work in the past that had stirred up airborne alpha particles, however OPG's monitors, controls and PPE had prevented any large alpha doses to the workers. The OPG representative added that additional protective measures had been implemented based on the lessons learned from recent alpha events, as well as from the CNSC's compliance verification activities and direction from Commission. The OPG representative expressed that OPG's workforce had become more proficient in respect of alpha hazards as a result of the events and lessons learned and that OPG was committed to reviewing and improving its RP programs.

32. Addressing the Commission's questions regarding the proper maintenance and use of PPE, the OPG representative responded that OPG had procedures in place for the correct maintenance and use of PPE, and that all PPE was inspected before use. The OPG representative added that OPG workers were trained in the use and fit-testing of PPE, and that the PPE was put on and

removed under the supervision of a radiation protection coordinator.

33. The Commission expressed its appreciation regarding the work performed by OPG and by CNSC staff on this matter. The Commission also asked for more detail regarding the results from the *in-vitro* analysis. The OPG representative informed the Commission that internal dosimetry was a complex task based on several contributing factors, and that OPG was in the process of collecting the relevant data. The OPG representative stated that, when OPG obtained the dosimetry results, it would provide them to CNSC staff and the Commission for review and further discussion, as required.

Darlington NGS Refurbishment Activities

34. The Commission noted that OPG would not replace the existing header during refurbishment activities, and asked OPG why this was so. The OPG representative responded that the header was not subject to the same degradation mechanisms as other reactor components and would therefore remain fit for service through the projected operating life of the unit. The OPG representative added that replacing the header would entail unnecessary additional costs and radioactive waste.

Events at the Bruce NGS

35. The Commission asked Bruce Power to share the Ontario Ministry of Labour's findings regarding the October 15, 2018 electric shock incident, as originally discussed in CMD 18-M58.[11] The Bruce Power representative responded that the Ministry of Labour's findings had not been made available to Bruce Power at that time.

36. The Commission requested details about the January 24, 2019 lost time injury (LTI) where a worker slipped and fractured their ankle at the Fire Training Facility. The Bruce Power representative provided details about the injury and the worker's recovery, noting that the worker had to undergo surgery. The Bruce Power representative added that information about the worker's return date was not yet known. The Commission noted the lack of detail about this LTI in CNSC staff's status report and

[11] CNSC CMD 18-M58, *Status Report on Power Reactors*, November 2018.

recommended that future reports include more details such as severity.

37. The Commission enquired about the return-to-service date for the transformer that was damaged during a fire at Bruce station B, as discussed during the December 2018 Commission Meeting.[12,13] The Bruce Power representative stated that the delivery of a new transformer had a long lead time, so it would be delivered to Bruce Power in late 2019 or early 2020, with installation taking approximately four weeks. The Bruce Power representative added that there were three other transformers of the same type at the Bruce B site that could provide the necessary loads to Unit 8.

Update on the Potassium Iodide Pill Working Group

38. CMD 19-M4 also provided information and an update regarding the Potassium Iodide Pill Working Group (KI Working Group), which was a commitment that was made by CNSC staff during the June 2018 hearing for the licence renewal for the Pickering NGS.[14] CNSC staff provided the following updates on this matter:

    - The public comment period for the draft KI Working Group Terms of Reference (ToR) closed on February 14, 2019. 17 submissions were received, six from federal and provincial organizations, six from non-governmental organizations (NGOs) and five from members of the public. CNSC staff and the other members of the KI Working Group were reviewing and dispositioning those comments.
    - Meetings were arranged with the KI Working Group members, as well as with the advisory committee that had been established with members of the public.

39. The Commission requested further information regarding the composition and representation of the KI Working Group and the advisory committee. CNSC staff informed the Commission that the KI Working Group was composed of the representatives from the CNSC, OPG, the Office of the Fire Marshal and Emergency Management Ontario, the Ontario Ministry of

[12] CNSC CMD 18-M62, Event Initial Report (EIR), *Transformer Fire and Mineral Oil Leak at Unit 8 of Bruce B Nuclear Generating Station*, December, 2018.
[13] CNSC CMD 18-M62.1, Presentation from Bruce Power, *Transformer Fire and Mineral Oil Leak at Unit 8 of Bruce B Nuclear Generating Station*, December, 2018.
[14] CNSC Record of Decision – Ontario Power Generation Inc., *Application to Renew the Nuclear Power Reactor Operating Licence for the Pickering Nuclear Generating Station*, published December 2018.

Health, and representatives from the municipalities that were within the 50-km ingestion planning zone.[15] With respect to the advisory committee, CNSC staff stated that the membership included the Canadian Environmental Law Association, the Toronto District School Board, the Toronto Catholic District School Board, the Municipality of Kincardine, Bruce Power, and an academic representative from McMaster University. CNSC staff also confirmed to the Commission that the advisory committee was composed entirely of groups external to the CNSC, with the exception of the committee chair. CNSC staff stated that the advisory committee would facilitate the involvement of members of the public and NGOs on the work and operation of the KI Working Group. The Commission expressed its appreciation that these external groups were included in the advisory committee.

EVENT INITIAL REPORTS (EIR)

Canadian Nuclear Laboratories (CNL) – Worker injured on January 9, 2019 at CNL Port Granby Project

40. With reference to CMD 19-M9, CNSC staff presented information regarding an event resulting in a serious injury at CNL's Port Granby Project site. On January 9, 2019, a worker employed by a contractor for CNL at the Port Granby Project site was injured while preparing to unload a roll-off bin from a truck. The roll-off bin unexpectedly began unloading, and pinned the worker's lower leg to the ground, resulting in serious injury to the individual which required hospitalization. Additionally, a CNL employee was treated for shock and released from the hospital on the same day after witnessing the accident.

41. The Commission invited CNSC staff to provide comments regarding this event. CNSC staff informed the Commission that CNSC staff was currently reviewing CNL's report on the event and would be providing any further information related to this event during the presentation of CNSC staff's Regulatory Oversight Report (ROR) for CNL sites in the fall of 2019. CNSC staff added that the event did not result in a radiological dose to the public or the workers involved, and there were no impacts to the environment.

[15] Office of the Fire Marshal and Emergency Management, *Provincial Nuclear Emergency Response Plan (PNERP) Master Plan 2017*, Section 2.2.4, subsection (f), www.emergencymanagementontario.ca/english/emcommunity/response_resources/plans/provincial_nuclear_emergency_response_plan.html.

42. The Commission enquired about the injured contractor's current condition. The CNL representative informed the Commission that the injured individual underwent surgery and was expected to have a full recovery.

43. Asked by the Commission about the Ontario Ministry of Labour's review of this event, the CNL representative stated that the Ministry of Labour had up to two years to complete the investigation and that the report was expected to go to the contractor, and not directly to CNL. The CNL representative added, however, that CNL expected to be provided with a copy of the Ministry of Labour's report.

44. The Commission enquired about corrective actions implemented to avoid the reoccurrence of this type of accident. The CNL representative indicated that most of the corrective measures put in place by the contractor as part of its lessons learned were related to keeping workers away from the roll-off bins while unloading the truck and added that those measures had not been implemented before the event.

45. The Commission asked whether information and operating experience about the event had been communicated to the manufacturer of the roll-off bin system. The CNL representative indicated that CNL contacted the manufacturer of the roll-off truck and that the manufacturer had been very cooperative in developing some additional engineering controls for the prevention of such an event, such as putting the controller into a case.

46. Regarding the second individual who became distressed over witnessing the event, the Commission enquired whether the individual was back to work and whether assistance had been provided by CNL. The CNL representative stated that the individual was back to work, with assistance available to the worker through CNL's Employee and Family Assistance Program (EFAP).

47. The Commission enquired about CNL's emergency response reporting and public disclosure of the event. CNSC staff indicated that the CNSC Duty Officer was promptly informed of the event and that CNL made a company-wide halt on the use of this type of equipment. CNSC staff added that the public were informed of the event via CNL's website and Facebook page. The CNL representative stated that CNL felt its communications with the public were effective but, as with all events, CNL would

review the actions taken and would make improvements as needed.

48. Regarding CNL's ongoing investigation of the event, the CNL representative informed the Commission that CNL's investigation was independent of the contractor's investigation but that the contractor was cooperating with CNL. The Commission expects an update to be provided to on this topic during the presentation of the ROR on the performance of CNL sites.

ACTION by December 2019

CNL – Power Outage at Chalk River Laboratories

49. With reference to CMD 19-M10, CNSC staff presented information regarding an event involving an unplanned power outage at CNL's Chalk River Laboratories (CRL). On February 3, 2019, CRL experienced a site-wide power outage as a result of an electrical malfunction of a 2,400V distribution cable. The CRL Fire Operations team extinguished and safely contained an electric cable fire in an underground service space near Building 701, a non-nuclear building. The CRL Backup Emergency Operations Centre was activated and the CNSC Duty Officer was notified.

50. The Commission invited CNSC staff to provide comments regarding this event. CNSC staff informed the Commission that CNL was conducting a root cause analysis of the event that would be reviewed by CNSC staff once submitted. CNSC staff also indicated that there were no worker injuries or adverse impacts to the environment as a result of this event, that the event did not result in a dose to workers or the public, and that site security was maintained at all times. CNSC staff added that normal operations had resumed at the CRL site on February 6, 2019, that power had been restored to all the buildings and that CNSC staff will be providing an update on the event to the Commission during the presentation of the 2018 ROR on CNL sites.

51. The Commission invited CNL to provide comments regarding this event. The CNL representative stated that this was a slow-moving event, not typical of a cable failure where there might be a strong arc in an open breaker. The CNL representative added that CNL had hired an external independent electrical forensic expert to review the event.

52. The Commission enquired about whether the on-site backup generator came on automatically. The CNL representative answered that there were a number of different backup generators at the CRL site, such as the independent backup generator for buildings like the NRU facility, and that those generators came on automatically and provided power. The CNL representative added that a number of buildings were powered by a central backup diesel generator that started but could not connect to the grid due to a faulty output breaker. The CNL representative further added that the breaker had been replaced and that what caused that breaker to open is part of the investigation.

53. Addressing the potential cause of the event, the CNL representative reported that a small break in the insulation resulting in a little amount of arcing was one of the suspected causes.

54. The Commission noted that breaks in the insulation were a sign of aging and asked CNL about the condition of other cables on site. The CNL representative informed the Commission that CNL was performing cable testing and breaker testing during annual electrical shutdowns. The CNL representative added that the defective cable was due for testing this coming summer.

55. The Commission enquired about the presence of additional similar cables at the CRL site. The CNL representative indicated that other installations on the CRL site were using cables at this voltage to distribute power. The CNL representative added that, following this event, CNL would review the cable risk assessment to ensure that cable with a higher risk would be inspected in priority.

56. On the predictability of this event, the CNL representative explained to the Commission that cable testing could detect when the insulation on a cable becomes weak, but that it was not indicating whether the insulation was brittle and prone to crack under some circumstances.

57. The Commission notes that CNSC staff committed to providing an update on this event during the presentation of the ROR on the performance of CNL Sites, scheduled for the fall of 2019. **ACTION** by December 2019

Isologic Innovative Radiopharmaceuticals: Exceedance of the Regulatory Dose Limit for Extremities by a Nuclear Energy Worker

58. Following up on the information provided in CMD 18-M65, discussed at the December 2018 Commission meeting,[16] the Commission asked for an update on iodine-131 (I-131) processing at Isologic Innovative Radiopharmaceuticals Ltd. (Isologic). CNSC staff indicated that Isologic was working towards compliance of the conditions of the designated officer order issued on December 19, 2018[17] and added that Isologic requested an opportunity to be heard regarding the order. CNSC staff added that training of Isologic's staff as required by the order had started and that no imminent shortage for diagnostic capsules for I-131 was expected.

59. The Commission is satisfied with the update provided and anticipates being provided additional information on this matter and the results of the investigation at Isologic as previously recorded in Action #18710.

INFORMATION ITEMS

Ontario Power Generation (OPG) – Update on Darlington NGS Unit 2 Process for the Return to Service

60. With reference to CMD 19-M6.1, OPG presented to the Commission a progress update for OPG's Darlington NGS Unit 2 refurbishment project. This update summarized the progress made on current refurbishment activities and summarized the OPG's way ahead for removal of regulatory hold points imposed on the project.

61. With reference to CMD 19-M6, CNSC staff presented an overview of the CNSC regulatory oversight activities for the refurbishment and return to service of Darlington NGS Unit 2, as well as an overview of the CNSC process for removal of regulatory hold points associated with the return to service. CNSC staff also presented OPG's progress on the implementation of the Integrated Implementation Plan (IIP) for all Darlington units and specifically for Darlington NGS Unit 2.

62. Asked about lessons learned and how they would be applied to future refurbishment projects, the OPG representative responded

[16] *Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held on December 12-13, 2018.*
[17] Order issued to Isologic Innovative Radiopharmaceuticals Inc., www.nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-action/isologic-innovative-radiopharmaceuticals.cfm, December 19, 2018.

that OPG collected a detailed register of lessons. The OPG representative provided an example of such lessons learned which involved the pre-heating of header pipes before welding feeder pipes to them, and how lessons learned were integrated in the schedule for the planned refurbishment of Darlington NGS Unit 3.

63. Addressing how the lessons learned were captured and whether OPG was looking at them in terms of the overall project, the OPG representative provided different examples of how lessons learned were captured, including the creation of a protocol that looked at potentially competing priorities between refurbishment and operations activities.

64. Asked about the organizational structure and accountabilities of the staff working on the refurbishment project, the OPG representative responded that the Return to Service Director, reporting to the Refurbishment's Director of Operations and Maintenance, was accountable for all activities related to returning Darlington NGS Unit 2 to service.

65. Addressing the activities required to remove the regulatory hold points to restart the reactor at 1% and 35% of reactor full power, the OPG representative explained to the Commission that, at 1% of full power, the reactor was critical and heated up. The OPG representative added that hot conditioning at low power was used to build a black magnetite protective layer inside the heat transport system as part of its chemistry control and protection. The OPG representative further noted that commissioning at low power allowed testing of in-core flux detectors and reactivity devices. In respect to hold point releases, CNSC staff explained to the Commission that OPG would have to demonstrate that the equipment in and around the reactor, for instance the flux detectors, was working properly or else the reactor would not be allowed to go to a higher power.

66. The Commission noted OPG's assertion about its strong safety culture and asked about the number of contractors who had worked on the refurbishment project and would be able to take some best practices back into industry. The OPG representative told the Commission that over 10,000 people had worked on the refurbishment project to date and that workers were now proactively discussing possible issues and changes in conditions during pre-job briefings. The OPG representative also added that the training and security clearance that contractors received at OPG were transferrable to Bruce Power and vice versa with only incremental changes related to the specific facility.

67. The Commission enquired about the reason for replacing the shutdown system computers and how the new computers would be verified and validated for service. The OPG representative explained to the Commission that the primary driver for executing that work was obsolescence of the equipment. The OPG representative added that OPG had a rigorous process for testing software but that the replacement of the shutdown system computers was a hardware upgrade only and that OPG would not change the software code.

68. Upon enquiry about the CNSC staff verification process for IIP commitments, CNSC staff informed the Commission that there were various levels of verification depending on the IIP commitment, including CNSC staff field inspections and engineering reviews.

69. The Commission enquired about the frequency for cleaning the steam generators, as well as the cleaning method. The OPG representative indicated that the steam generators were cleaned every three years as part of the planned outage cycle and the lifecycle management program. The OPG representative added that two separate mechanical processes were used, a method similar to sand blasting on the primary side and water lance cleaning on the secondary side.

70. Further on the cleaning of the steam generators topic, the Commission asked about the storage of the waste generated during the cleaning. The OPG representative explained that the waste generated on the primary side was stored in shielded waste containers and considered a long-term waste product.

71. The Commission enquired about the role relative to refurbishment in the planned 2020 peer review of the World Association of Nuclear Operators (WANO). The OPG representative indicated that WANO would send a peer review team to the Darlington NGS in 2020 to review OPG's operations as part of the two-year cycle for reviews. CNSC staff further noted that this WANO review was not related to the refurbishment-related regulatory hold points.

72. The Commission enquired about the auxiliary shutdown cooling system being installed during the refurbishment. The OPG representative explained that the Darlington NGS was designed with only a single shutdown cooling system and that it was a longstanding CSNC requirement to address that during the refurbishment outage. The OPG representative added that OPG

was installing an alternate system to create redundancy for the major components of the shutdown cooling system circuit. The OPG representative also stated that this system provided cooling to the fuel primarily in shutdown conditions or at low power.

73. Asked about the anticipated challenges presented by the return to service of Darlington NGS Unit 2, the OPG representative explained to the Commission that the presence of foreign materials in the systems was a concern. The OPG representative added that the commissioning of systems that were modified could impact the return to service as well as the maintenance activities required on systems that may have been idle during the refurbishment period. The OPG representative further indicated that it would also be a challenge for OPG staff to go from a construction project to an operating reactor and undertook that OPG would never compromise safety due to scheduling pressures.

74. Further on the anticipated challenges of the return to service, CNSC staff indicated to the Commission that, for CNSC staff, the return to service was a gradual process whereby the systems that had to be available for each regulatory hold point removal were identified and verification activities were ongoing. CNSC staff added that it would ensure that required activities are performed.

75. Upon enquiry about the cultural changes required from OPG staff to go from a construction project to operating the reactor, CNSC staff explained to the Commission that OPG completed safety culture self-assessments in 2018, with CNSC staff actively involved in reviewing those reports. CNSC staff also stated that CNSC staff was looking at additional training for CNSC inspectors on safety culture aspects related to this project.

76. The Commission enquired about the gap between CNSC staff's planned and completed inspections for 2018-19. CNSC staff explained that seven type 2 inspections were planned for 2018-19, that three had been completed and the other four inspections were still ongoing.

77. Asked about the next refurbishment update to the Commission, CNSC staff answered that an update with respect to the progress of the refurbishment will be presented at each one of CNSC's NGS status updates, at the removal of hold points and when the Darlington NGS Unit 2 will return to service as requested by the

Commission in its 2015 licence renewal decision.[18] CNSC staff added that the anticipated return to service date was in the first or second quarter of 2020. The OPG representative confirmed the anticipated return to service date noted by CNSC staff.

CNSC Participation in the Single Window Initiative

78. With reference to CMD 19-M5, CNSC staff presented an overview of the Single Window Initiative (SWI), a Government of Canada program to modernize the import process, to reduce the administrative burden on importers and to enhance compliance verification for regulators. The Canada Border Services Agency (CBSA) was assigned as the lead agency for SWI working with nine other participating departments and agencies, involving 38 government programs. A CBSA representative was available to answer the Commission's questions during the meeting.

79. The Commission enquired about the early detection of irregularities regarding import licences using the SWI. CNSC staff explained that CNSC staff can see the importer's declaration ahead of time and before the goods arrived at the border, allowing more time for the review and reducing the time the goods spend at the border.

80. The Commission enquired about the human component required for use of the SWI. CNSC staff indicated that the licence review and the decision-making process was still the same as before. CNSC staff added that specific staff at the CNSC was dedicated to the review of import declarations and that CNSC staff reviewed approximately five declarations per week.

81. Asked about the occurrence of radioactive material smuggling into Canada, the CBSA representative indicated that people trying to smuggle goods in Canada was a common threat and that, unfortunately, people trying to smuggle would not be giving valid information to the CBSA. The CBSA representative added that different tools were used by the CBSA to try to stop smugglers. The CBSA representative further stated that the information provided by importers was verified and updated if required before an import permit was validated.

[18] CNSC Record of Decision – Ontario Power Generation Inc., *Application to Renew the Nuclear Power Reactor Operating Licence for the Darlington Nuclear Generating Station*, published March 2016.

82. Addressing the capacity for the detection of radioactive material at the border, the CBSA representative indicated that radiation monitors were one of the tools used at the border, adding that monitoring was performed randomly. CNSC staff told the Commission that the CNSC and the CBSA had a protocol for when nuclear substances were detected at the border to validate whether a CNSC licence was required in respect of the substances and to confirm that the importer had that licence. CNSC staff provided the example of contaminated car parts imported from Japan after the Fukushima accident whereby the CNSC and the CBSA worked together to determine whether there was a risk associated with those imports.

83. The Commission enquired about whether there was also an electronic system for exports to the United States. The CBSA representative explained that, currently, the SWI system focused on imports because imports were posing a higher risk. The CBSA representative also stated that the export component would be added when the import component was completed. CNSC staff indicated to the Commission that the same verification process was in place for the imports and exports, but the exports system was not done electronically yet.

84. Asked about the percentage of licensees using the SWI, CNSC staff answered that all submitted declaration had been processed through SWI but that the number of licensees using SWI was not known. CNSC staff added that the electronic system provided more information to the CNSC than the paper-based system. The CBSA representative told the Commission that CBSA will start decommissioning legacy services for some government agencies after April 1st, 2019.

85. The Commission enquired about whether it was possible for the CBSA to deny goods from entering the country even with a valid CNSC licence. CNSC staff explained that CBSA could deny entry for many different reasons and provided the example of co-regulated goods where the importer may have a valid CNSC licence but be missing one for another government agency.

86. Addressing the reason why the CNSC developed its SWI implementation software in-house, the CBSA representative indicated that the CBSA dictated the format and individual agencies created software that met their different requirements which were based on the goods that they regulated.

87. The Commission enquired about the consequences of using both systems simultaneously, the SWI and the paper-based system.

CNSC staff told the Commission that the only difference between the two processes was that with the SWI the processing of imports was done electronically versus the human resource needed for the paper-based process. The CBSA representative indicated that the rigour applied in both processes was the same. The CBSA representative added that the paper declaration would probably completely disappear in the next 2 to 5 years.

Closure of the Public Meeting

88. The public meeting closed at 2:37 p.m. The meeting continued as a closed session with the Commission being provided general technical briefings on safeguards and nuclear security from CNSC expert staff.

Recording Secretary — Date: APR 12 2019

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Secretary — Date: APR 12 2019

APPENDIX A

19-M1	2019-01-14	5756736
Notice of Commission Meeting		
19-M2	2019-02-08	5756742
Agenda of the Meeting of the Canadian Nuclear Safety Commission (CNSC) to be held on Wednesday, February 20, 2019, in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario		
19-M3	2019-02-18	5795021
Draft Minutes of December 12-13, 2019 Commission Meeting		
19-M8	2019-12-21	5770524
Update from CNSC Staff – Request from the Commission to the Municipality of Port Hope and the Canadian Nuclear Laboratories for the publication of radiological survey results conducted in Port Hope		
19-M7.1	2019-01-28	5772701
Darlington Nuclear Generation Station: Update on Alpha Contamination Event Submission from Ontario Power Generation		
19-M7.1A	2019-03-14	5855830
Darlington Nuclear Generation Station: Update on Alpha Contamination Event Supplementary Submission from Ontario Power Generation (responses filed after the meeting)		
19-M7	2019-02-05	5782034
Ontario Power Generation – Darlington Nuclear Generating Station: CNSC Staff Update on Alpha Contamination Event – Action from November 8, 2018 Commission Meeting Submission from CNSC Staff		
19-M4	2019-02-15	5787337
Status Report on Power Reactors Submission from CNSC Staff		
19-M6.1	2019-02-07	5784801
Darlington Nuclear Generation Station: Update on Process for the Return to Service Darlington Unit 2 Presentation from Ontario Power Generation		
19-M6	2019-02-20	5783914
Darlington Unit 2 CNSC Process for return-to-Service Presentation from CNSC Staff		

CMD	Date	e-Docs No.
19-M9	2019-02-15	5793372
Event Initial Report – Canadian Nuclear Laboratories (CNL) – Worker injured on January 9, 2019 at CNL Port Granby Project Submission from CNSC Staff		
19-M10	2019-02-15	5793380
Event Initial Report – Canadian Nuclear Laboratories (CNL) – Power Outage at Chalk River Laboratories Submission from CNSC Staff		
19-M5	2019-02-20	5789741
CNSC Participation in the Single Window Initiative (SWI) Presentation from CNSC Staff		