Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held on August 16 and 17, 2017

Minutes of the Canadian Nuclear Safety Commission (CNSC) meeting held Wednesday, August 16 and Thursday, August 17, 2017 beginning at 9:02 am at the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, ON.

Present:

M. Binder, President
S. Demeter
R. Seeley
S. A. Soliman
S. McEwan

M. Leblanc, Secretary
L. Thiele, Senior General Counsel
C. Moreau, P. McNelles and S. Gingras, Recording Secretaries

CNSC staff advisors were:
R. Jammal, G. Frappier, J. Stevenson, K. Campbell, B. Gracie, S. Simic, M. Santini, A.Viktorov, H. Khouaja, D. Saul, L. Sigouin, C. Purvis, G. Renganathan, E. Lemoine, G. McDougall, K. Noble, C. Ducros, A. McAllister, M. Rinker, V. Tavasoli, K. Glenn, N. Mesmous, A. Bouchard, M. Beaudette, Y. Poirier, R. Kameswaran, P. Elder, R. Awad, Y. Akl, R. Richardson, S. Yalaoui, J. Campbell, S. Karkour, G. Lamarre, L. Youdale, K. Owen-Whitred, L. Hunter, A. Derouin, C. Carrier, D. Miller, C. Dodkin, P. Fundarek, H. Tadros. J. Thelen, J. LeClair, S. Martel and S. Faille

Other contributors were:

Hydro-Québec: D. Olivier
Bruce Power: F. Saunders, G. Newman, L. Clewett and M. Burton
Ontario Power Generation: Z. Khansaheb, S. Smith, R. Lockwood, S. Lesiuta, J. White, R. McCalla and R. Manley
NB Power: M. Hare, J. Nouwens and S. Waycott
Canadian Nuclear Laboratories: S. Cotnam, M. Owen, K. Kehler and C. Hebert
Cameco Corporation: L. Mooney

Others:
Office of the Fire Marshal and Emergency Management: M. Morton
Health Canada: K. Buchanan
Canadian Environmental Law Association: T. McClenaghan and K. Blaise
Consultants: V. Snell and M. Fleming
U.S. Department of Health: X. LoDico and X. Flegel
U.S. Nuclear Regulatory Commission: P. Harris
Canadian Centre on Substance Use and Addiction: S. Meister
Occupational Medicine Consultant: R. Davidson
Society of Energy Professionals: S. Travers
Ministry of the Environment and Climate Change: C. Redmond
Urine Drug Forensic Toxicologist Consultant: A. Fraser

Constitution

1. With the notice of meeting CMD 17-M31 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 June 8th, 2017, Commission member documents CMD 17-M13, CMD 17-M15, CMD 17-M32, CMD 17-M34 to CMD 17-M37 were distributed to members. These documents are further detailed in Annex A of these minutes.

Adoption of the Agenda

3. The revised agenda, CMD 17-M32.A, was adopted as presented.

Chair and Secretary

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

Minutes of the CNSC Meeting Held June 8, 2017

5. The minutes of the Commission meeting held June 8, 2017 were approved secretarially by the Commission members before this meeting.

STATUS REPORTS

Status Report on Power Reactors

6. With reference to CMD 17-M34, which includes the Status Report on Power Reactors, CNSC staff presented updates on the following:

   - Bruce Unit 4 was derated to 63 percent of full power on August 14th due to an emergency stop valve failing closed. This valve is not nuclear-safety related.
   - Bruce Unit 8 returned to full power on August 13th.
   - Darlington Unit 1 returned to full power on August 11th.
   - Pickering Unit 1 returned to full power on August 15th.

7. Noting the recent incidents involving electrical equipment, the Commission enquired about the verifications done on this equipment. CNSC staff responded that they verify the acceptability of the licensees' inspection programs in these areas. Regarding the existence of a database for changing this equipment, the Bruce Power representative explained that programs are in place to

monitor equipment performance. An asset management program was also initiated to plan the replacement of the equipment nearing the end of its life. The Ontario Power Generation Inc. (OPG) representative confirmed that similar programs are in place at the Darlington and Pickering facilities. The New Brunswick Power (NB Power) representative also stated that similar programs as at Bruce Power and OPG are in place at the Point Lepreau NGS.

Bruce A Unit 3 Primary Heat Transport Pump Gland Seal leak

8. The Bruce Power representative provided further details regarding a heavy water leak at Bruce A Unit 3 caused by a primary heat transport pump seal failure. The Bruce Power representative provided details on the location of the pumps and the area where the heavy water leaked. The water was contained within that area and none of it went into the environment. Diagnostic work is being performed on the motor. A repair plan is being prepared and will be submitted to CNSC staff for approval. The Bruce Power representative also noted that the other pumps were verified extensively and that no indication of problems was found.

9. Asked about the length of time that was required to clean up the heavy water, the Bruce power representative stated that the cleanup took approximately 1.5 days.

10. CNSC staff confirmed that it will report again to the Commission on the event should the root cause analysis results deem it to be necessary.

Bruce A Unit 4 Partial Loss of Class IV Power

11. Regarding the Bruce A Unit 4 partial loss of Class IV power, the Commission asked for an explanation on which equipment is connected to Class IV power and about measures taken to return this equipment to work. The Bruce Power representative explained that several pieces of equipment are connected to Class IV power, the main ones being the primary heat transport pumps. Two of those pumps were lost when Class IV power was lost. The Bruce Power representative stated that the plant is designed to withstand this type of event, eventually using thermo-siphoning to cool down the reactor. However, this event involved a fast shutdown from full power which are usual operating conditions, therefore verifications are done on equipment to ensure safe conditions since stress on this equipment was present.

12. The Bruce Power representative confirmed at the request of the Commission that SDS-1 (shutdown rods) and SDS-2 (injection of gadolinium nitrate) were used to shut down the reactor. The Commission asked if 10 days were sufficient for the reactor to

return to full power considering the inspections that needed to be done. The Bruce Power representative explained that crews are present 24 hours per day to perform inspections on equipment, and that these inspections did not find anything. The Bruce Power representative also confirmed that two to three days are needed to remove the poison from the moderator.

Bruce Power Unit 8 Derating

13. Regarding the Bruce Power Unit 8 derating, the Commission asked for more information on lake temperature and its effect on equipment. The Bruce Power representative explained that the lake temperature definitely has an impact on normal operations, with the biggest impact being on the condenser. The Brue Power representative added that the province of Ontario has limits on the degree to which the licensee's water discharge to the lake temperature. During the summer, the reactor power may need to be reduced to meet this limit (or a special permission may be requested from the province to exceed the limit). The Bruce Power representative also noted that, in this case, part of the cooling circuit was shut down for maintenance which forced the reduction of reactor power. The Bruce Power representative confirmed that they do not currently see any climate change impacts on the operation of the plant, and that, this year, the lake water was cooler than usual.

Bruce B: Worker Injured due to Electrical Shock

14. The Commission noted that this incident was similar to one at Bruce Power in February 2016. The Commission asked whether the workers were Bruce Power employees. The Bruce Power representative responded that one was a Bruce Power employee and the other one a contractor. Regarding follow-up actions to this event, CNSC staff explained that Bruce Power was asked to look at the conventional health and safety program as a whole to determine if lower-level injuries could be prevented, therefore preventing higher-level ones.

Worker Heat Stress in Darlington Unit 2 Vault

15. Regarding the worker heat stress incidents in the Darlington Unit 2 vault, the Commission enquired about what specific corrective measures taken to prevent reoccurrences. The OPG representative responded that cooling tents were installed to allow employees to cool if necessary, and that training on awareness of heat stress symptoms was also provided.

Moderator Spill in Darlington Unit 4

16. The Commission asked about the relationship between the procedural misstep causing the moderator spill incident and the shutdown system. CNSC staff explained that a vent valve was inadvertently left open during a sampling of the liquid injection shutdown system, causing the moderator release. There is no relationship between the incident and the shutdown system, since the incident was related to a sampling tank. The shutdown system remained available at all times.

Lubricating Oil Spill at Pickering Unit 1

17. The Commission asked for an explanation of the measures taken to prevent another lubricating oil spill at Pickering Unit 1. The OPG representative explained that all floor drains are normally closed, but that one was inadvertently left open and caused the spill. Operators were instructed to perform daily verifications to ensure that valves are closed. The OPG representative confirmed that some oil was emitted to the lake and that a contractor was called in to perform the cleanup.

Pickering Unit 1 Trip

18. The Commission asked if fuses similar to the ones that caused the trip were verified elsewhere in the facility. The OPG representative confirmed that these fuses are used throughout the plant and that other fuses were verified and no issued were found. The only defectives fuses were found in one panel and the OPG workers are trying to determine a possible cause for this event.

Point Lepreau Shutdown

19. Regarding reasons for the August 4 shutdown at Point Lepreau, the NB Power representative explained that the manual shutdown was caused by an equipment issue and that the plant was safely shutdown without any human performance issues. Verifications were performed on the unit transformer while the plant was shut down to ensure that these gas relays were operating effectively. NB Power is following up on this issue through its corrective action program to try to identify any other issues with the gas relay. CNSC staff stated that NB Power did a proper investigation of the issue.

INFORMATION ITEMS

Annual CNSC Staff Regulatory Oversight Report for Canadian Nuclear Power Plants: 2016

20. With reference to CMD 17-M15 and 17-M15.A, CNSC staff presented its annual report for 2016 on the safety performance of the Canadian nuclear power industry. CNSC staff highlighted the safety ratings for nuclear generating stations (NGS) across all safety and control areas (SCA), as well as the industry average ratings. CNSC staff also reported on the compliance verification program and compliance activities, and provided an overview of the event initial reports (EIR) submitted to the Commission during 2016. The report also encompassed the responses to the audit conducted by the Commissioner of the Environment and Sustainable Development of the CNSC site inspection of nuclear power plants (NPPs); industry compliance to probabilistic safety assessment requirements (REGDOC-2.4.2[1]); emergency management developments; and the completion of the implementation of the Bruce Power Environmental Assessment Follow-up Program.

21. Representatives from Canadian NPP licensees submitted their comments regarding CNSC staff's ratings presented in the report. The OPG representative commented on their goal to move their performance from satisfactory to fully satisfactory for every SCA. The Bruce Power representative expressed concerns with Bruce Power's rating in the security SCA, while the NB Power representative concurred with the *Regulatory Oversight Report for Canadian Nuclear Power Plants: 2016* (ROR) findings.

22. The Commission complimented CNSC staff on this year's ROR. The Commission made suggestions for further information to be added in future RORs, as well as editorial changes.

Interventions

23. With reference to the written submission from the Canadian Environmental Law Association (CELA) (CMD 17-M15.3), the Commission asked about the provision of documents to the public in a timely fashion. CNSC staff discussed the challenge of distributing technical information to the public without adding significant amounts of time to hearing and meeting processes.

24. The Commission acknowledged in the meeting that some intervenors felt the public review period for the ROR was short. The Commission instructed the Commission Secretary to review

[1] CNSC Regulatory Document REGDOC-2.4.2, Safety Analysis: Probabilistic Safety Assessment (PSA) for Nuclear Power Plants, CNSC, May 2014.

some options for addressing this expressed concern. If a process change is warranted, the Commission will consider it.

25. The Commission sought clarification on the evaluation of off-site emergency plans. CNSC staff responded that it is a requirement for licensees to be interacting with the responsible authorities and first responders. CNSC staff has access to the emergency plans from the different jurisdictions. CNSC staff requires the licensees to include these authorities in their evaluations of overall response, for example carrying out emergency exercises that include provincial authorities. The licensees' emergency plans should also contain information on the interactions between the licensees and responsible authorities. A representative from the Office of the Fire Marshal and Emergency Management (OFMEM) elaborated on the Provincial Nuclear Emergency Response Plan (PNERP), including the activities done relating to the publication of the updated draft PNERP (for example, public consultation, emergency exercises and the review of external reports to verify the validity of the information in the updated PNERP) which is scheduled for 2018. The OFMEM representative also provided information on evacuation planning and potassium iodide (KI) pill distribution. A representative from Health Canada provided information on the responsibilities described in the *Emergency Management* Act[2] and the Federal Nuclear Emergency Plan.

26. The Commission enquired about the emergency exercise that was carried out at Bruce Power and on whether the lessons learned from that exercise were available to other licensees. CNSC staff responded that every licensee is required to perform a major exercise on a periodic basis. The representative from Bruce Power explained that the lessons learned are shared between the different licensees and that they attend other licensees' exercises as observers.

27. The Commission sought more information about the size and the classification of emergency planning zones comparatively to the international safety standards. CNSC staff responded that all of the jurisdictions in Canada are following international standards and best practices regarding zone sizes and the number of zones.

28. The Commission asked for clarification about workers' maximum radiation doses during an emergency. CNSC staff explained that the limit for emergency situations is set out in the *Radiation Protection Regulations*[3] which is under review with a view to include graduated dose limits. The regulations also require the licensees to inform the workers of the risks associated with the

[2] Statutes of Canada (S.C.) 2007, chapter (c.) 15.
[3] Statutory Orders and Regulations (SOR)/2000-203.

exposures that they may receive and of the applicable dose limits. A Bruce Power representative mentioned that, in Bruce Power's view, the current emergency dose limits are too restrictive.

29. The Commission asked if the regulating agencies are planning for INES Level 7 scenarios. CNSC staff mentioned that they did studies that have different INES levels, including INES Level 7. A representative from the OFMEM noted that they are looking at the worst-case emergency exercise scenarios to ensure that the emergency plan is comprehensive.

30. The Commission enquired about the requirements for sirens. A representative from the OFMEM responded that alerting requirements under the current plan are met. The OPG representative concurred with the OFMEM representative.

31. Respecting CSA Group (CSA) standards reviews, CNSC staff noted that the CSA standards reviews are part of the CSA review process which provides for public involvement by interested parties. The members of committees developing any standard are formed from recognized experts in the field. A representative from Bruce Power mentioned that the standards are available on the Communities of Interest website for viewing.

32. The Commission enquired about the suggestion from CELA that CNSC cease reliance on CSA standards. CNSC staff responded that using the standards is essential. The Commission agrees with CNSC staff that CSA standards are most useful.

33. The Commission sought more information about self-decontamination in the emergency response plans. A Bruce Power representative responded that they deliberately do not tell people how to self-decontaminate since the public typically does not have the proper instrumentation to verify if contamination is still present.

34. The Commission asked about CELA's comment on the minimalist approach of CNSC documentation relating to emergency planning. CNSC staff explained that the CNSC documents are not the entire picture and that other agencies also have documents. A representative from the OFMEM stated that there is extensive documentation from a provincial perspective. The OPG representatives described the existing documentation from the licensee side, noting that OPG has a very robust emergency plan.

35. Representatives from CELA commented that the CNSC should create its own guidance about the development of safety zones, that CELA had little involvement in the creation of the CSA standard on Nuclear Emergency Programs and that emergency planning

should be a central topic for every future ROR.

36. With reference to the written submission from JMH Technology Consulting (JMH) (CMD 17-M15.2), the Commission enquired about the safety significance of two previous impairments (related to safety system unavailability) and the effect they had on public safety. Regarding the first impairment, CNSC staff mentioned that the CCA system valve, which is part of the emergency coolant injection (ECI) safety system, was operational at all times so the safety significance is very small. However, the stroke time for that valve needed to be adjusted to prevent water hammer[4] and potential damage to the system. Bruce Power representatives explained that this ECI event was a change management issue, with operators not properly implementing a change to operating procedures. Bruce Power representatives also explained that another event (unavailability of negative-pressure containment system (NPCS)) was related to a valve that was sensitive to a potential harsh environment and a switch which could also fail in a harsh environment. An OPG representative stated that the Darlington NPP does not have the same issues.

37. Referring to comments on maintenance backlogs, the Commission sought clarification about the deferrals of preventative maintenance and corrective maintenance backlog and their safety significance. CNSC staff responded that these numbers are changing on a daily basis depending on which work is getting done. CNSC staff added that they do not look specifically to a number but at the trend on a quarterly basis. CNSC staff also noted that, from a safety significance perspective, the corrective maintenance backlog is the most important parameter to watch, and the Equipment Reliability Index (ERI) from CANDU Owners Group (COG) is the parameter that the licensees are trying to meet. CNSC staff also explained the monitoring performed by CNSC staff regarding the reliability of the systems, as well as requests for corrective actions to be completed. A Bruce Power representative explained that they are working to keep the corrective maintenance backlog numbers as low as possible and provided information on the parameters that they are watching to verify the health of the system. The OPG representative also commented that they are striving to have an ERI index of 0.

38. The Commission enquired about what was done by the licensees with root cause analyses after they were produced. The NPP representatives explained that they utilize the root cause analyses to determine corrective actions and share them in Canada through COG and worldwide through the World Association of Nuclear

[4] Water hammer is a pressure surge or wave caused when a fluid in motion is forced to stop or change direction suddenly (momentum change).

Operators (WANO).

39. The Commission enquired about additional research related to extended fuel channel operation and where it will be done. CNSC staff provided information on the research program, adding that experiments were done at the Canadian National Laboratories in Chalk River. CNSC staff also stated that some results were already available and were used to evaluate the integrity of the components.

40. The Commission asked CNSC staff regarding performing Level 3 probabilistic safety assessments (PSA). CNSC staff answered that JMH provided interesting examples in other industries, that they continue to review that position and are looking at what the United States Nuclear Regulatory Commission (USNRC) will be doing in this respect.

41. The Commission sought information about international benchmarks for collective dose. CSNC staff responded that there are some benchmarks established by WANO but there is no CNSC expectation that the licensees follow those targets. CNSC staff requires the licensees to set challenging targets based on the predicted work. A Bruce Power representative explained that the collective dose data was useful for trending at one plant but not for comparison between different nuclear plants.

42. With reference to the written submission (CMD 17-M15.4) from the Métis Nation of Ontario (MNO), the Commission enquired about the engagement and consultation process for the environmental assessment for the next NPP relicensing and how the MNO is involved. CNSC staff replied that they have a typical structure and approach to Aboriginal consultation and engagement for all regulatory reviews. CNSC staff also added that the Métis are working with the Bruce Power and OPG in identifying valued components around the Bruce Power site.

43. The Commission asked for an update on the plan to measure the populations of particular fish of interest to the Indigenous groups for the environmental risk assessments, as was discussed in the last licence renewal hearings for the Bruce Power NPP. The Bruce Power representative explained that they first focused on the lake whitefish for assessment because it was a species of special interest to the Saugeen Ojibway Nations. The representative added that the results of these studies are shared with any interested groups.

44. The Commission sought information about the DFO permitting process. CNSC staff and NPP representatives provided details about how the process works and the timelines.

45. With reference to the written submission (CMD 17-M15.5) from the Canadian Nuclear Workers' Council, the Commission asked about how the perceived close collaboration between the unions and the licensees is achieved and the added value it brings. CNSC staff responded that the unions participate in licensing hearings as well as commenting on some regulatory documents. The NPP representatives described their involvement with unions.

46. With reference to CMD 17-M15.6 from the Power Workers' Union, the Commission asked if CNSC staff is tracking stoppages of unsafe work and, if so, the frequency of occurrence. CNSC staff mentioned that work stoppages are handled by the Ministry of Labour in Ontario with a follow up by CNSC staff. A Bruce Power representative added that such stoppages happen two or three times per year.

47. With reference to the comment from Northwatch in its written submission (CMD 17-M15.7) regarding information about fuel bays, CNSC staff stated that they are looking at how they will be reporting on nuclear waste and fuel bays at NPP sites. CNSC staff also noted that annual reporting on waste management facilities will be consolidated in the 2017 NPP report. CNSC staff provided information on the compliance activities related to the irradiated fuel bays.

General Questions

48. The Commission sought clarification about minimum shift complement. CNSC staff explained that it is the minimum set of qualified individuals being able to perform, whether in normal operation or emergency situations. Measures are in place in order to mitigate minimum shift complement non-compliances. NPP representatives provided information on measures taken to meet the minimum shift complement and explained that a station will go to quiet mode operation if the minimum shift complement is not met.

49. The Commission asked why Bruce A and B have different integrated plant ratings. CNSC staff responded that both stations still have separate compliance programs.

50. The Commission congratulated the licensees for the good results in conventional safety and asked if the number presented include the contractors or only the staff. CNSC staff said that this particular safety performance indicator does not include contractors. For the next ROR, CNSC staff will consider aligning the performance indicator with WANO’s and include contractors.

51. The Commission asked about transients and if proper analyses are performed in order to see their impacts. The Bruce Power representative explained that, after a transient, Bruce Power performs an engineering evaluation to determine the extent of condition of the systems.

52. The Commission sought clarification about the difference between NPPs for airborne radionuclides. CNSC staff stated that it was a matter of how the different companies set the detection limits, as well as the proximity of the monitoring stations to other facilities on site or construction areas.

53. The Commission asked about security training and qualification. CNSC staff responded that they set and review training standards through a number of means and provided more details on those means.

54. The Commission asked for clarification on a sentence in the chemistry index paragraph. CNSC staff responded that they will add more clarification before the report is issued.

55. The Commission expresses its satisfaction for the quality and the content of the ROR, as well as the input of the intervenors, and invited CNSC staff to review the transcripts for suggested improvements to future RORs. CNSC staff indicated that following the implementation of the suggested changes, the 2016 ROR would be finalized and published.

Follow-up on the August 2016 Commission Proceedings on the Anonymous Letter

56. With reference to CMD 17-M37, CNSC staff updated the Commission on the follow-up actions following the August 2016 Commission meeting item on an anonymous letter alleging that key documents regarding probabilistic safety assessments were not provided to Commission members. A third-party expert, Dr. Victor Snell, described the role of probabilistic safety assessment (PSA) in the safety analysis area and in the regulatory framework, compared the Canadian NPP approach to international practice and provided recommendations. CNSC staff agrees with Dr. Snell's conclusions. CNSC staff considers that all follow-up actions arising from the August 2016 Commission proceedings on the anonymous letter have been addressed.

57. CNSC staff also presented the actions pertaining to raising issues and safety culture arising from recommendations made by P. Elder during the August 2016 Commission meeting and the direction received from the Commission.

58. The Commission asked about the role of PSA in Japan and whether a retrospective look at the role of PSA relative to Fukushima was performed. Dr. Snell and CNSC staff responded that, before the Fukushima event, PSA was being performed in Japan but was not a regulatory requirement. Japan is now in the process of implementing this as a requirement.

59. In response to a request for clarification on responsibilities respecting PSA and DSA (deterministic safety assessment), CNSC staff responded that the licensees do the analysis while CNSC staff's role is to review and accept their analysis.

60. The Commission sought clarification on the definition of the core damage frequency in terms of structure, the probability that the entire core is damaged as well as the frequency of occurrence. Dr. Snell responded that a single fuel channel failure is covered by the design basis. Dr. Snell added that, in PSAs, the frequencies are typically around one every 100 reactor years for a single channel failure and would be less than one in 100,000 reactor years for multiple channel failures. CNSC staff added that the severe core damage for CANDU reactors is defined in REGDOC-2.4.2 as a condition where there is extensive physical damage to multiple fuel channels leading to loss of core structural integrity.

61. The Commission enquired about the target audience for the documentation on "regulatory role of probabilistic safety analysis". CNSC staff responded that the documentation is for internal use and that the executive summary, which was written for a more general audience, is on the CNSC website.

62. The Commission requested that CNSC staff post the report from Dr. Snell on the CNSC website, as well as provide more details in the executive summary to make it clearer for the general public.

63. The Commission sought clarification about the weakness of PSA related to characteristics of very rare single events. CNSC staff responded with an example about earthquakes, where the severity of an earthquake of a frequency of one in 10 000 years could be estimated, but the estimation of severity of an earthquake of a lesser frequency would be more difficult since there is no experience from which conclusions could be drawn.

64. The Commission asked about the use of DSA for risk-informed decisions. Dr. Snell responded that DSA is not useful by itself for risk-informed decisions; more reliance on the PSA should be done for making such decisions. CNSC staff explained that DSA is one of the inputs for risk-informed decision making along with PSA.

65. The Commission asked if SLOWPOKE reactors are included in PSA for non-power reactors. Dr. Snell responded positively and noted that PSAs for SLOWPOKEs could be relatively short and simple.

66. The Commission sought information about Level 3 PSAs being conducted by the United States Nuclear Regulatory Commission (USNRC). CNSC staff said that the USNRC did not share information on their approach yet and that the assessment is taking longer than anticipated. CNSC staff expressed its intention to cooperate with the USNRC on this matter. CNSC staff added that PSA level 3 is not a mature process and cannot be used at this time for regulatory decisions. The Commission commented that CNSC staff should refer to the recent MOU with the USNRC to request information.

67. The Commission enquired whether the PSA should focus on the probability of being able to supply water to cool off the core regardless of the initiating accident. CNSC staff responded that the benefit of the emergency mitigating equipment (EME) is deterministic.

68. The Commission asked if Level 2 PSAs (containment assessment) consider the vacuum building. CNSC staff responded that PSAs do take credit for the vacuum building. The Commission further asked about the probability that the containment may fail. CNSC staff explained the PSA methodology to review pressure release events and noted that the probability of a large-release scenario is in the order of 10^{-5}.

69. Respecting the CNSC's internal raising issues processes, the Commission sought clarification on how to differentiate which process should be used: the non-concurrence process or the differences of professional opinion. CNSC staff responded that the difference is the level of formality between the two processes, the differences of professional opinion being more formal and that the two approaches should be kept.

70. Responding to the Commission's question about good examples of regulator safety culture from which the CNSC could learn, Dr. Mark Fleming responded that regulator safety culture assessment is relatively new and there is no data available on the subject. Dr. Fleming expressed the view that CNSC staff has produced a high quality safety culture assessment. CNSC staff commented that workers at the CNSC seem to be more comfortable raising issues with their supervisor than before, according to surveys performed over the last few years.

71. The Commission asked about metrics that could be used to evaluate licensee safety culture. CNSC staff responded that the key metrics are: high staff engagement, high confidence of being able to report, and a strong focus on safety.

Update on the Public Information Program for Devices Containing Radium Luminous Compounds

72. With reference to CMD 17-M13 and CMD 17-M13.A, CNSC staff presented an update on the *Public Information Program for Devices Containing Radium Luminous Compounds*. Effective January 1, 2006, the Commission indefinitely exempted devices containing radium luminous compounds from the limitations specified under paragraph 8(b) of the *Nuclear Substances and Radiation Devices Regulations*[5] (NSRDR). Under this exemption, a person may possess, transfer, or use any number of Radium Luminous Devices (RLDs), provided that radium is the only nuclear substance in the device and the device is not disassembled or tampered with.[6] As part of its decision, the Commission requested that CNSC staff present periodic reports on any issues related to the exemption for RLDs, including information on the public information program that was developed to support that exemption. The previous update on the exemption of RLDs was presented to the Commission during the February 16, 2012 Commission proceeding, as detailed in CMD 12-M6.[7] CMD 17-M13 represents the second report to the Commission on this topic. As of the August 16 and 17, 2017 Commission Meeting, there has been no event or development that would lead staff to recommend a change to the exemption.

73. The Commission noted that the exemption for the RLDs does not allow for those devices to be disassembled or tampered with, and asked how this is assured. CNSC staff responded that the public information program provides information to the public and to stakeholder groups with respect to the exemption and the regulations. CNSC staff stated that it performed a number of outreach activities before the NSRDR came into force in the year 2000, concentrating on high-risk activities such as aircraft service providers, as they would disable and/or repair these devices in order to guide them into compliance with the NSRDR. CNSC staff added that this public information program is well-known, that there is no fear from the general public regarding RLDs, and that CNSC staff do receive questions from the public regarding the safe handling and disposal of RLDs. CNSC staff noted that it is rare for

[5] SOR/2000-207.
[6] CNSC Meeting Minutes –*Minutes of the Commission Meeting of December 1, 2005*.
[7] Commission Member Document (CMD) – CMD 12-M6, *Update on the Public Information Program for Devices Containing Radium Luminous Compounds*, February 16, 2012.

them to come across a damaged RLD. Addressing the use of media outlets as part of the public information program, CNSC staff reported that, in the past, it used media outlets such as the *Legion* magazine, and attended military collector shows to make connections and hand out brochures. CNSC staff added that articles have also been posted on social media, such as the CNSC Facebook and Twitter pages.

74. The Commission noted that some of the RLDs may be incorrectly disposed of in municipal landfills, despite it being prohibited. Addressing the use of radiation monitors at municipal facilities, CNSC staff reported that not all landfills and scrap yards have radiation monitoring systems. If such a system is installed, then it would generally detect the presence of a discarded RLD. CNSC staff added that CNSC duty officers receive on average one report per year of an RLD being discovered in a landfill or scrap yard. While there is potential that an RLD may be disposed of, and remain undetected in one of those facilities, these RLDs often have some value or historical significance to collectors, so they are unlikely to be discarded.

75. The Commission enquired about the radiation dose rate at the surface of the aircraft dials. CNSC staff stated that the dose rate will vary between different RLDs based on their size and radium content. CNSC staff informed the Commission that the dose rate from RLDs was seen to vary from approximately 2 microsieverts per hour for wristwatches and timepieces, up to about 400 microsieverts an hour for larger military items. The Commission notes that the timepieces and wristwatches generally contain less than the licensable quantity for radium.

76. The Commission asked about the total number of RLDs that remain in circulation. CNSC staff responded that exact numbers for Canada are not known. However, studies have shown that, during the 1950s and 1960s, most households in Canada would likely have possessed a radium luminous clock or watch. CNSC staff noted that, in the USA, an estimated one hundred million radium luminous clocks and watches were manufactured over that same time period. CNSC staff added that other household items were also painted with radium luminous paints, making the use of RLDs very widespread in the past, and that certain RLDs may be very valuable and collectible.

77. The Commission notes that Canadian Nuclear Laboratories (CNL) maintains the Historic Artefact Recovery Program in order to safely recover and dispose of legacy radioactive materials. The Commission asked about the cost to the individual for the safe disposal of an RLD. The CNL representative explained that the assessment, classification, and transport of the RLD to a licensed

long-term storage facility is at no cost to the requester, as long as CNL can confirm that the artefact is orphaned. Regarding the number of requests that are received by CNL for the disposal of RLDs, the CNL representative reported that CNL receives between four and ten requests per year from individuals, landfills, scrap yards, commercial entities and government agencies, and that each request may be for multiple artefacts. The CNL representative stated that the artefacts were previously stored in a licensed storage facility at the Chalk River Laboratories (CRL) site. However, the artefacts are currently disposed of in a licensed storage facility in Stittsville, Ontario. The CNL representative noted that these artefacts will be moved from the Stittsville site to the CRL site once enough artefacts have been collected to make their transportation practical. The CNL representative added that it will assess every request, and if the request does not qualify for the artefact program, then it will be redirected to other individuals or agencies that may be able to assist the requester.

78. The Commission notes that there are currently two licensees that service RLDs: IMP Group Limited (IMP Group) in Halifax and Wright Instruments Limited (Wright Instruments) in Mississauga. CNSC staff informed the Commission that IMP Group has been a licensee since December 1992 and was last inspected in October 2014, and that Wright Instruments has been a licensee since 1994 and was last inspected in May 2015. The Commission notes that only a small number of minor non-compliances were found during those respective inspections, and that both licensees are maintaining their licences and programs. The CNL representative added that the owner of Wright Instruments is planning to dispose of some of his inventory of RLDs using CNL's artefact recovery program.

Commission's Decision

79. The Commission recognizes that the NSRDR are slated to be reviewed in the year 2019 and that the Commission may, at that time, amend the regulations with respect to RLDs. Therefore, the Commission no longer requires CNSC staff to provide periodic updates related to issues concerning RLDs. **DECISION**

DECISION ITEMS – REGULATORY DOCUMENTS

Draft Regulatory Document REGDOC-2.2.4, *Fitness for Duty*

80. With reference to CMD 17-M35 and CMD 17-M35.A, CNSC staff presented to the Commission CNSC Regulatory Document REGDOC-2.2.4, *Fitness for Duty*, for consideration. This document sets out the requirements and guidance of the CNSC

with respect to fitness for duty programs for workers at high-security sites, as defined in the *Nuclear Security Regulations*.[8] The *General Nuclear Safety and Control Regulations*[9] (GNSCR) require a licensee to have a sufficient number of workers that are fit for duty on site at all times. The implementation of REGDOC-2.2.4 aims to provide regulatory clarity, strengthen the fitness for duty regulatory framework, ensure that the fitness for duty of workers is managed for the purposes of nuclear safety and security, and is consistent with the International Atomic Energy Agency (IAEA) guidance with respect to fitness for duty at nuclear facilities. The first volume of this document, REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue*,[10] was published on March 21, 2017. The REGDOC-2.2.4 series will provide an overview of the CNSCs regulatory expectations relating to fitness for duty.

Comments from Licensees

81. The Bruce Power representative stated that Bruce Power supports the overall approach taken in this proposed REGDOC. The Bruce Power representative noted that this REGDOC constitutes an oversight process that would provide confirmation that the current processes are working correctly, and reported that the licensees currently maintain effective fitness for duty programs at all high-security sites. The Bruce Power representative stated that effective fitness for duty programs are already in place at the licensee sites, and that this REGDOC would provide additional evidence to the public that those programs are effective.

82. Addressing specific concerns that the licensees had with respect to the proposed REGDOC, the OPG representative stated that pre-placement and periodic medical tests could cover a wide range of the population and could include everyone on the minimum shift complement. The OPG representative noted that OPG and Bruce Power accept the provision of these tests for certified control room personnel.

83. The CNL representative informed the Commission that all of the licensees for the five high-security sites agree on improving safety at those sites, and that all of these licensees are successfully managing aspects related to fitness for duty. The CNL representative stated that the implementation of this REGDOC would be very difficult for licensees due to their collective agreements with the employees and due to the potential legal ramifications. The CNL representative noted that, based on the information provided by the Bruce Power representative, it took

[8] SOR/2000-209.
[9] SOR/2000-202.
[10] CNSC Regulatory Document, REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue*, March 2017.

four years for Bruce Power to develop a psychological testing program for a small portion of its worker population and that CNL recommended that a phased approach, beginning with a small worker population, would be the most effective way to start the implementation of the requirements in the proposed REGDOC.

84. The NB Power representative noted the importance of NPP workers being fit for duty, with a special emphasis on the certified control room operators and the armed Nuclear Response Force (NRF) staff, and reiterated the licensee's commitment to safety at the sites. The NB Power representative expressed that the issue of drug and alcohol testing is a sensitive subject due to a Supreme Court of Canada decision[11] related to a Canadian company's drug and alcohol testing policy, which may further increase the difficulty in implementing the proposed REGDOC. The NB Power representative voiced concerns regarding some of the requirements and guidance in Section 4.1 of the proposed REGDOC.

85. The NB Power representative provided a suggestion that, if the requirements that mandate a position-by-position analysis were removed, then the scope of the REGDOC would be clearer, and it would facilitate an improved implementation process for the REGDOC. The OPG representative also made a suggestion with regards to Section 4.1 of the proposed REGDOC, with respect to the minimum shift complement. The OPG representative further questioned whether the current analysis of positions where fatigue could be a factor would result in the same positions having the same requirements for medical, psychological, drug and alcohol testing.

Comments from Unions

86. The Society of Energy Professionals (SEP) representative stated that SEP's position on the proposed REGDOC has remained unchanged from the submissions it made during the consulting phase. The SEP representative reported that its members understand the importance of safety at the nuclear power plants and have a strong safety culture, which is reflected in the safety performance statistics for those plants. The SEP representative provided an overview of the information that was included in its submissions, including that there is no evidence of a drug or alcohol problem at the nuclear power plants, or that the proposed testing provisions will improve public safety. The SEP representative stated that the existing fitness for duty programs are effective and comprehensive, and that the use of drug and alcohol testing would be an unnecessary invasion of the worker's privacy

[11] *Communication, Energy and Paperworkers Union Canada Local 30 v. Irving Pulp and Paper Ltd. [2013] 2 SCR 458*

that could negatively affect the safety culture at the sites. The Commission notes that the SEP representative recommended against the approval of the REGDOC.

Written Comments from the Canadian Human Rights Commission

The Commission recognized and appreciated the written comments that were provided to the CNSC from the Canadian Human Rights Commission (CHRC) in 2012 and 2016, as part of the public consultation program for the proposed REGDOC. The Commission notes that these comments provided CNSC with additional information and guidance regarding the applicability of the *Canadian Human Rights Act,*[12] requirements and guidance for employer accommodation, the appropriateness and limits of drug and alcohol testing for the different worker populations, and the appropriateness and the limits for the random drug and alcohol testing of the workers. The Commission further notes that CNSC staff made several amendments to the proposed REGDOC based on those comments in recognition of worker rights and to align the requirements of the proposed REGDOC with the *Canadian Human Rights Act*. The Commission recognizes that the CHRC remains available to provide assistance and consultation to CNSC staff with respect to the proposed REGDOC.

General

87. Clarifying the scope of the proposed REGDOC-2.2.4, CSNC staff reported that the scope is limited to the high-security sites, as defined in the *Nuclear Security Regulations*, and that a list of those facilities was provided in the presentation by CNSC staff.

88. The Commission asked if it would have been more appropriate to use the term “should” as opposed to “shall”, in Section 4.1 of the proposed REGDOC. The Bruce Power representative stated that there was not always a clear distinction between those words with respect to CNSC staff’s treatment of the various REGDOCs. The Bruce Power representative further stated that the proposed REGDOC presents more significant challenges than REGDOC-2.2.4, Volume I, *Fitness for Duty: Managing Worker Fatigue*, due to the interactions with workers and the worker unions. Addressing testing requirements for the fire brigade, the Bruce Power representative stated that the organization does not object to physical testing for those personnel, as that is the current practice, although drug and alcohol testing was not implemented for those positions. The Bruce Power representative added that fire brigade personnel are primarily on site on an emergency basis. The Commission noted that the fire brigade would only be subject to

[12] Revised Statutes of Canada (R.S.C.), 1985, c. H-6.

for-cause testing.

89. Addressing the reasoning for the selection of the threshold 25% of the designated worker population over a year for the random drug and alcohol tests, CNSC staff reported that it considered the thresholds used by other organizations, such as the U.S. Department of Transportation (DOT), the U.S. Nuclear Regulatory Commission (USNRC) and the Toronto Transit Commission (TTC). CNSC staff stated that from its research and consideration, a threshold of 25% annual testing would provide the appropriate level of deterrence, respect human rights and privacy, and not place an unnecessary burden on the licensees. The Substance Abuse and Mental Health Services Administration (SAMSA) representative stated that there is no absolute correct figure, and that the cut-off value may be changed in the future if the evidence warrants it. The SAMSA representative noted that the exact cut-off value will vary between the different private companies and government agencies, and that private companies often do not disclose the positive test rate.

90. The Commission voiced concern regarding its view that the medical issues and medical conditions were being conflated with alcohol and substance abuse in the proposed REGDOC, and provided detailed examples and rationale regarding its view. CNSC staff responded that the overall fitness for duty for workers is comprised of various elements, such as drug and alcohol testing, psychological requirements, and physical requirements, which are well understood. CNSC staff reported that factors affecting these aforementioned elements may impair workers abilities to perform their tasks when needed, and therefore the proposed REGDOC seeks to remediate those issues, as was done with the previous REGDOC regarding worker fatigue. CNSC staff noted that CNSC staff could hold further consultation with the USNRC regarding their fitness for duty programs for workers occupying Safety Sensitive Positions (SSPs). CNSC staff added that, overall, the intent of this REGDOC was to address the full scope of the fitness for duty requirements within one regulatory document. Dr. Davidson, an occupational medical consultant, stated that he found it acceptable to include drug and alcohol testing in the same document as the medical and psychological requirements, and noted that there is significant overlap between these elements. Dr. Davidson added that his main concern would be for physicians to be able to correctly diagnose and treat substance abuse problems among workers.

91. CNSC staff informed the Commission that many of the requirements in the proposed REGDOC, such as medical, psychological, and occupational fitness requirements originate in RD-363, *Nuclear Security Officer Medical, Physical and*

Psychological Fitness.[13] CNSC staff stated that the elements of alcohol and drug testing were added based on available evidence on substance abuse from the Canadian Centre on Substance Abuse (CCSA) and from the rates of substance abuse in the populations near the sites, which were then integrated into the proposed REGDOC. CNSC staff further stated that the guidance seen in section 3.8 of the proposed REGDOC related to training, education, assistance, and awareness stems from the INFO-0831[14] report by Barb Butler, a policy expert on substance abuse. CNSC staff added that the proposed REGDOC contains the necessary information to inform the employees of all the provisions related to fitness for duty requirements and testing.

92. Addressing the decision to separate REGDOC-2.2.4 into separate volumes (REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue* and the proposed REGDOC), CNSC staff responded that the original plan was to issue the REGDOC on worker fatigue much more rapidly than what occurred. CNSC staff stated that it wanted to ensure that there was a fulsome discussion specifically on hours of work and fatigue followed by a separate discussion on the matter addressed in this proposed REGDOC, believing this was a fulsome discussion in its own right, due to the importance of those factors to safety and security at the NPPs.

93. Regarding security concerns with respect to potential events caused by workers at the sites, the Bruce Power representative stated that if there was a worker thought to be acting erratically or if there was another cause for concern, then there are confidential ways to identify and investigate if any other actions are required.

<u>For-Cause Testing</u>

94. CNSC staff provided clarification regarding "post-incident testing", stating that this practice is generally related to human error that may have contributed to an event and that the licensee would need to determine if post-incident testing would be required. The Commission expressed concern over the practicality of such a testing program, noting that it may be several weeks before an investigation would determine if this testing would be warranted, rendering it irrelevant. CNSC staff responded that post-incident testing would typically be conducted shortly after an incident, if there was the possibility that human actions contributed to that event. CNSC staff added that the licensee would not wait for the results of the root cause analysis before performing this testing. CNSC staff confirmed that the supervisor could request a for-cause

[13] CNSC Regulatory Document, RD-363, *Nuclear Security Officer Medical, Physical and Psychological Fitness*, November 2008.
[14] CNSC INFO-0831, *Recent Alcohol and Drug Workplace Policies in Canada: Considerations for the Nuclear Industry*, March, 2012.

test if they suspected worker impairment may have contributed to an event. CNSC staff added that, with respect to the proposed REGDOC, the intent is to ensure that the for-cause testing is carried out if the for-cause potential is identified.

95. Addressing the existing licensee programs with respect to for-cause testing, the Bruce Power representative reported that if it was believed that worker impairment or a worker health issue caused an event or was identified during routine work, then that worker would be subjected to for-cause testing. The Bruce Power representative stated that currently, there is no exact definition as to what constitutes an event for the purposes of for-cause testing, however that will be addressed as the requirements for the proposed REGDOC are implemented. Addressing the recordkeeping of the results from those for-cause tests, the Bruce Power representative stated that the results are tracked, but the results are not made public. The Bruce Power representative also stated that the test results may be kept in the worker's medical records, or in a disciplinary or accommodation process, depending on the results of those tests.

96. Asked about the difference between "for-cause reasonable grounds" testing and "for-cause post incident testing", CNSC staff responded that the testing program outlined in the proposed REGDOC contains standard, well-established categories found across the industry. CNSC staff stated that the post-incident testing would occur if it was believed that human factors may have contributed to the event, however there is no cause to suspect that the worker was impaired. CNSC further stated that the reasonable grounds testing would be performed if an event occurred and there was an indication that the worker was potentially impaired during that event. CNSC staff added that reasonable grounds testing is generally based on supervisor awareness or peer observation. CNSC staff added that these forms of testing have also been delineated by the USNRC.

Scientific Literature

97. The Commission noted that a large volume of scientific literature was considered during the preparation of this REGDOC, however the information from the literature was not directly included in this documentation. CNSC staff responded that an extensive review of the scientific literature was performed, including a review of third-party reports which was mentioned in CNSC staff's presentation. CNSC staff noted the difficulty in summarizing and including all of the comprehensive scientific data into the CMDs. CNSC staff stated that, as indicated in the Appendix of CMD 17-M35.A, independent reviews of important topical areas such as urine analysis, alcohol, toxicology, and medical reviews were conducted,

and that drug and alcohol policy experts were also consulted. CNSC staff added that significant internal literature reviews were also performed. The Commission notes that, as the CNSC is a science-based organization, more scientific data should have been included in the CMDs. CNSC staff reported that a list of the reference material would be prepared and submitted to the Commission. The Commission accepted this proposal and requested that CNSC staff also prepare concise summaries of key references.

98. Addressing the source for the USNRC and DOT data, as seen in slide 36 of CMD 17-M35.A, CNSC staff stated that the third-party data was provided by DriverCheck and was aggregated with data from the USNRC for comparison purposes. With respect to the DOT one percent positive test rate value, CNSC staff stated that it is taken from *Section 49 Code of Federal Regulations (CFR), Part 219.602*.[15] Addressing additional data from the USNRC as seen in slides 37 and 38 of that CMD, CNSC staff stated that that information was taken from a summary report of testing results provided by the USNRC, which can be found on that organization's website.

99. The Commission stated that the inclusion of more information from subject matter experts in the different fields of work (such as legal or medical) would have been beneficial with respect to the potential approval of the proposed REGDOC. CNSC staff responded that a great deal of research papers and reports as well as legal cases were reviewed during the drafting of this proposed REGDOC. CNSC staff stated that the information from subject matter experts provided CNSC staff with the recommendations in the form of research reports that are available on the CNSC website, and will be provided to the Commission at its request. CNSC staff reported that the CMD will be updated based on the Commissions' request and that CNSC staff will provide additional information and clarity in order to amend the CMD if so requested by the Commission, and that the integrity of the REGDOC will be maintained, as it must be clear with respect to the regulatory requirements.

<u>International Practices on Drug and Alcohol Testing</u>

100. On the selection of countries used for the comparison of international practices for the drug and alcohol testing for nuclear operators, CNSC staff stated that this comparison focused solely on the countries that utilize random testing and that CNSC does possess information regarding the practices of other countries that

[15] 49 CFR 219.602, *FRA Administrator's Determination of Random Drug Testing Rate,* U.S. Government Publishing Office (GPO), October 2011.

were not included in that comparison. CNSC staff noted that it did not verify the practices of all countries that operate NPPs. Addressing the fitness for duty practices for operators in nuclear power plants in France, CNSC staff stated that that fitness for duty assessments are primarily performed through medical assessments. The Commission notes that not every country operating nuclear power plants includes random drug and alcohol testing as part of its fitness for duty programs. The Commission stated that the inclusion of the fitness for duty programs for the full profile of countries for nuclear operators that are represented in the World Association of Nuclear Operators (WANO) would have been beneficial for the comparisons made by CNSC staff.

101. The Commission notes that similar fitness for duty programs have been implemented in countries such as the US and the United Kingdom, and that the IAEA has also provided information with respect to fitness for duty programs. Asked about the implementation of the fitness for duty programs in the USA, the USNRC representative responded that the USNRC believes that fitness for duty programs are a direct contributor to the safety and security of the sites. The USNRC representative provided a summary of the history of drug and alcohol testing at NPPs in the US, such as the voluntary basis for drug and alcohol testing outside of the licensing basis used by certain NPPs, to the implementation of the fitness for duty program at all NPPs by the USNRC. The USNRC representative described certain challenges that were encountered, such as worker protection, program integrity and effectiveness, and legal challenges to the overall Federal Drug Testing Program throughout the US federal government. The USNRC representative added that Canada would have the benefit of the lessons learned from the experience in the USA when preparing to implement a fitness for duty program.

102. Addressing additional lessons learned from the experience of the USNRC with respect to implementing a fitness for duty program, the USNRC representative stated three further points of interest:

- That all policies and procedures must be clear and written in detail, in order to provide for worker protection and ensure the effectiveness of the program.
- That the sample collectors must be vigilant, and that a pre-assessment test is important to identify and treat individuals who have a substance abuse problem before they are hired.
- That there must be clear guidance for the medical review officers regarding the use of both illicit and prescription drugs.

103. The Commission noted that the scope of the proposed REGDOC is very broad and includes a large variety of testing and requirements

related to fitness for duty. The Commission asked the USNRC representative about the scope of the fitness for duty programs implemented in the USA. The USNRC representative stated that licensed operator medical conditions are regulated under 10 CFR 55,[16] a different provision from the drug and alcohol testing. The USNRC representative informed the Commission that at the US NPPs, the fitness for duty provisions for licenced operators are prescribed in 10 CFR 26,[17] and that apart from the fitness for duty requirements, the requirements for security officers are under a separate provision. The USNRC representative noted that the CNSC staff proposal would include multiple provisions used by the USRNC in one regulatory document and that many of the physical and physiological requirements proposed by CNSC staff are in place in the US for security officers. The USRNC representative noted that in Canada, the proposed REGDOC would cover spent fuel storage facilities, however in the US those facilities are not covered under 10 CFR 26. The USNRC representative stated that the scope of workers included in the fitness for duty programs are different in the USA than in the proposed REGDOC, as the USNRC requirements list a larger variety of positions that must be included.

Human Performance and Proposed REGDOC-2.2.4 Implementation

104. Regarding the management of change with respect to the proposed implementation of REGDOC-2.2.4, as well as its effects on human performance and safety culture, CNSC staff reported that, if this REGDOC was to be approved, licensees would be required to submit an implementation plan. CNSC staff noted that the licensees have proposed a phased approach for the potential implementation of this REGDOC. With respect to the management of change within the organizations, CNSC staff stated that the way in which drug and alcohol testing is introduced is critical to its overall success, and that the engagement of the employees and unions is important as the testing is phased in.

105. CNSC staff provided an overview of the implementation process for REGDOC-2.2.4, if it were to be approved by the Commission. CNSC staff reported that, after approval, the REGDOC would be included in the recommendation and guidance section of the Licence Condition Handbook (LCH). Once each licensee has updated its safety and control measures to reflect the specifications of the REGDOC, the REGDOC would be moved into the Compliance Verification Criteria (CVC) section of the LCH, when compliance with the human performance program licence

[16] USNRC 10 CFR 55 – *Operator's Licenses*, 1992.
[17] USNRC 10 CFR 26 – *Fitness For Duty Programs*, 1989.

requirement will include this REGDOC. CNSC staff noted that this is a complex and complicated document which considers a large number of employees, therefore licensees would be allowed time to submit a detailed implementation plan, as per the usual process following the approval of new technical standards and regulatory documents. CNSC staff stated that the licensees may make use of a phased approach and that, in CNSC staff's view, the changes made to meet the requirements of the REGDOC will positively affect the safety culture at the sites. CNSC staff added that it will also consider in detail the impact on its own compliance verification program, such as the inspections and other compliance tools that would be needed to ensure licensees are in meeting the specifications of this REGDOC.

106. CNSC staff reported that amendments to the draft REGDOC were made to address human rights concerns. CNSC staff provided examples of this, such as explicitly listing the duty to accommodate within the REGDOC, and reducing the scope of the document to ensure that only the most SSPs would be subjected to random drug and alcohol testing, along with incorporating other recommendations from the CHRC. CNSC staff stated that the proposed REGDOC emphasized that licensees must consider all relevant privacy-related legislation when implementing their fitness for duty programs. CNSC staff added that for-cause testing, such as when there are reasonable grounds to suspect impairment after an incident or for the follow up for a person with known substance dependence, is widely accepted in Canada.

107. Addressing the frequency at which medical conditions pose a risk to licensee operations, as well as the administrative and financial resources required to implement the specifications of the proposed REGDOC, the Bruce Power representative reported that the implementation of a drug and alcohol testing program is relatively straightforward but noted that that legal challenges could complicate its implementation. Regarding physical and psychological testing, the Bruce Power representative stated that is more complex, especially with respect to the armed security personnel, who may need to make the decision to use deadly force. The Bruce Power representative added that it took approximately four years to develop the psychological testing program for armed security personnel, after lengthy consultations with experts and union representatives. The Bruce Power representative noted that there may be a case for psychological testing for shift crews such as control room operators, which may be subject to significant stress at their job.

108. Regarding physical testing, the Bruce Power representative stated that both fire and security personnel undergo physical testing, are required to stay physically fit as part of their job duties, and are

given the necessary time and access to facilities in order to stay physically fit for duty. The Bruce Power representative noted that it took about three years to develop the physical testing program and physical requirements, after consultation with experts. The Bruce Power representative added that there are no physical requirements for control room operators; however, they are required to report any physical problems that may affect their ability to perform their work duties.

109. CNSC staff stated that the definition of SSPs has previously been defined in REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue*, including the certified workers and the minimum shift complement, pending the analysis performed by the licensees as per their implementation plans, which are due at the end of September 2017. CNSC staff added that the only other group which needed to be specifically identified was the Emergency Response Team (ERT). CNSC staff clarified that there is only one analysis required from the licensees, which is to determine the SSPs, and that the re-examination of the minimum shift complement personnel would be performed as part of that analysis.

110. The Commission notes that a phased approach of the different elements of the fitness for duty program would ease the implementation of the proposed REGDOC. The Bruce Power representative stated that starting the implementation and then expanding the fitness for duty program to a larger population would facilitate an improved expansion of the fitness for duty program to the necessary populations. CNSC staff reported that the phased implementation may be acceptable, and is one of the reasons that CNSC staff will require a detailed implementation plan from the licensees. CNSC staff noted that these implementation plans should be developed in consultation with the licensee's own experts in areas such as change management and safety culture, in order to ensure that the implementation of the fitness for duty requirements does not impact the safety and security of the sites. CNSC staff added their recommendation that the phase-in of the proposed REGDOC not take too long, in order to avoid confusion caused by a partial implementation of the proposed REGDOC.

111. Providing additional details with respect to a phased implementation of the proposed REGDOC, CNSC staff stated that the first step would be to describe the program measures that would need to be in place, such as the requirements for medical, physical, drug or alcohol testing. CNSC staff reported that if a stepwise approach is used, then care must be taken in order to avoid imposing dual requirements on fitness for duty for personnel such as Nuclear Security Officers (NSOs), for which requirements currently exist in RD-363, and for emergency responders, with

respect to N293, *Fire protection for nuclear power plants*.[18] CNSC staff noted that it understands the rationale in regard to a phased approach to the implementation of this REGDOC. CNSC staff recognized the clarity sought by industry regarding the relevant worker populations, and noted that REGDOCs may be amended from time to time. CNSC staff added that additional guidance may be added with respect to the fitness for duty requirements for NSOs and NRF personnel. The Commission notes that there are existing fitness for duty requirements for ERT, NSO and NRF personnel.

Affected Worker Populations

112. Regarding the discretion that the licensees have with respect to designating certain positions as "safety sensitive" and to design the fitness for duty program that fits other particular positions, CNSC staff confirmed that licensees do have that ability. The OPG representative reported that, from his understanding of the proposed REGDOC, the licensee would be required to perform both pre-placement medical testing and periodic testing for the entire minimum shift complement. The OPG representative stated that OPG has not observed any medical issues from several staff positions that would affect the safety of an NPP and questioned how the additional proposed requirements would improve safety at the plant.

113. The Commission notes that the medical requirements and the extent of the medical testing may be very simple for many of the workers at the NPPs. The Commission asked if medical testing was performed for ERT and fire brigade members, and the OPG representative stated that requirements were already in place for those positions. The Bruce Power representative stated that medical testing is in place for the populations where Bruce Power believes it is necessary, and that medical testing would not be required for certain positions. The Bruce Power representative added that workers at Bruce Power have a good record of disclosing medical problems and then being reassigned to perform other tasks. The Bruce Power representative noted that the wording in the REGDOC could be made to be clearer with exactly what population of workers would require what form of testing. The Commission expressed its belief that the clarity of all REGDOCs is of great importance.

114. The Commission notes that some of the requirements in the proposed REGDOC were already in place at the licensees' sites. Asked for its view of the issue of tests for the minimum shift complement, CNSC staff responded that it is a longstanding requirement, and is determined by each licensee based on G-323,

[18] CSA N293-12 (R2017): *Fire protection for nuclear power plants*, 2012 (Reaffirmed 2017).

Ensuring the Presence of Sufficient Qualified Staff at Class I Nuclear Facilities - Minimum Staff Complement,[19] and then included in each LCH. CNSC staff reported that under the proposed REGDOC, licensees would have the ability to remove a member of that minimum shift complement from testing, if they are deemed not to be in a SSP. CNSC staff added that the purpose of the minimum shift complement is to ensure that the minimum number of critical staff that occupy safety-sensitive roles are present at the sites, were a design basis accident (DBA) to occur. The Bruce Power representative responded that the minimum shift complement must demonstrate that it meets certain capabilities, and therefore licensees have limited freedom when determining this complement. The Bruce Power representative stated that, for most positions within the minimum shift complement the duties and physical requirements would not change in an emergency situation, with respect to the normal job tasks. The Bruce Power representative noted that for certified personnel, there would be increased stress during such a scenario.

115. Regarding CNSC staff's view on the required tests for the minimum shift complement members under the proposed REGDOC, CNSC staff responded that Section 4.1 covers the identification of SSPs and that it clearly indicates certain positons that would be designated as such. Addressing the minimum shift complement at large, CNSC staff stated that the licensee may designate positions from that complement as non-safety-sensitive, if it can be shown through the use of risk analysis that the impairment of the workers in those positions would not cause a significant incident. The Bruce Power representative reported that CNSC staff would still need to approve that analysis before the position would not be classified as safety-sensitive, therefore it is not a decision made solely by the licensee.

116. Asked what the minimum shift complement is at the licensee sites, the Bruce Power representative responded that the minimum complement would be thirty certified workers (Authorized Nuclear Operators (ANOs)) at each station (Bruce A and Bruce B), totalling sixty ANOs. The Bruce Power representative reported that on top of the ANOs, each site at Bruce Power requires fire brigade and security personnel, bringing the minimum shift complement up to 50-100 people per station, or about 150-200 between the two stations. The Bruce Power representative further stated that there is a potentially large pool of people who are qualified for the minimum shift complement, bringing the minimum shift complement into the range of 1,200-1,500 persons. The Bruce Power representative added that if the minimum shift complement

[19] CNSC Regulatory Guide, G-323, *Ensuring the Presence of Sufficient Qualified Staff at Class I Nuclear Facilities - Minimum Staff Complement*, July 2007.

is said to include administrative staff, as well as everyone that may be called into work and who could be assigned to the minimum shift complement, then the total number could be a few thousand.

117. CNSC staff informed the Commission that the determination of the SSP population is done in a manner consistent with what was presented in REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue*, which was approved during the December 2016 Commission meeting.[20] CNSC staff reported that, pursuant to that REGDOC, licensees currently have a requirement to perform an analysis to determine what positions will be designated as SSPs, which is in-line with the approach taken in the proposed REGDOC. Addressing the role of minimum shift complement during an accident scenario, CNSC staff reported on CNSC staff reviews and verified the analyses performed by licensees, including their emergency procedures within the design basis. CNSC staff stated that during an emergency, licensee staff may need to don protective gear, and may need to perform tasks or enter locations that pose additional physical or stress challenges. CNSC staff asserted that this is the basis on which the minimum shift complement is said to occupy SSPs, however CNSC staff also re-iterated that, under the proposed REGDOC, the SSP may be determined through analyses by the licensees based on their own emergency planning information.

118. The Commission notes the concerns of the licensees with the proposed REGDOC regarding the issue of designating SSPs with respect to the minimum shift complement and that it would have been beneficial had the approval process for SSPs been clearer. The Commission stated that issues with the implementation and application of REGDOCs may be brought before the Commission for consideration and decisions as well.

119. The Commission noted that REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue* considered only worker fatigue while the proposed REGDOC has human rights implications. The Commission asked if the worker populations could be compared between the two documents. The OPG representative stated that OPG is finalizing its implementation plan for REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue*, including the analysis for the positions where worker fatigue may be a factor. The OPG representative stated that during the course of their analysis, there may be some cases where positions within the minimum shift complement would require limits on hours of work, however they would not require pre-placement testing or psychological testing.

120. CNSC staff provided an overview of the purpose and intent of the

[20] *Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held on December 14, 2016.*

proposed REGDOC, which was to support the performance of workers with respect to safety and security and to capture the risks that various worker impairments (physical, medical, etc.) may pose to the operation of the sites. CNSC staff stated that this aforementioned information formed the basis for classifying SSPs, and recognized that licensees are responsible for safety at the sites, and therefore are left to designate the job requirements and fitness for duty for each position. CNSC staff reported that in the proposed REGDOC, certain roles were specified, such as certified nuclear operators, ERTs, and the minimum shift complement. CNSC staff added that the minimum shift complement serves as a level of defence for severe accident management, and some workers may have to perform physically demanding tasks. CNSC staff noted that the REGDOC-2.2.4 series intends to ensure all actions will be performed by capable people during the prescribed time period.

121. Some Commission Members expressed the concern that licensees would be able to determine what positions should be designated as SSPs, using the existing job requirements and job classifications. CNSC staff reported that a comprehensive list of all SSPs was not provided in the proposed REGDOC, as the CNSC is a performance-based regulator, as opposed to a prescriptive regulator. CNSC staff stated that the licensees are required to determine the SSPs, as they are responsible for safety, and due to their understanding of their own operations at the sites. CNSC staff recognized that certain positions needed to be designated as SSPs, such as certified operators, who are certified by Designated Officers (DOs). CNSC staff added that the remaining SSPs within the organizations and minimum shift complement would be determined through the licensees own analysis, based on the specific training and tasks they would perform in the case of an accident scenario. The Commission notes the challenge faced by the licensees with respect to performing an analysis on each worker position at their sites.

Worker Medical Information

122. The Canadian Centre on Substance Use and Addiction (CCSA) representative elaborated on the experiences of other organizations that implemented similar drug and alcohol testing programs. The CCSA representative stated that many of them were large organizations with safety-sensitive positions, and that a number of these organizations stated that, in terms of the testing information that is collected and transmitted for workers who may have a substance abuse issue, highly personal or medical information was not transmitted. The CCSA representative stated that generally, the intermediary between the employing organization and the testing organization would only be the test result, or in the case of an employee undergoing a treatment program, whether or not the

employee successfully completed the program. The CCSA representative added that typically, medical information would not be transmitted between organizations, however recommendations from medical professionals may be sent to the employer.

123. Addressing medical issues related to privacy and the ways in which medical information is generally handled, Dr. Ron Davidson, an Occupational Medicine Consultant, stated that risk management from a medical perspective encompasses two issues: the potential risks of an incident, as well as the potential consequences of that incident. Dr. Davidson provided a detailed overview of some of the medical assessments for licensee workers, as well as some of the deficiencies he had experienced with medical assessments in safety-sensitive positions. Dr. Davidson gave a summary of an improved process for medical assessments, involving the compilation of a comprehensive medical examination record/report, including the detailed medical information that would be provided to the worker, who will then deliver it to the medical staff at the licensee, thereby ensuring a chain of control. Once this information is received by the medical staff at the licensee, they can determine if the worker is fit without restrictions, fit with restrictions, unfit, or if more information is needed to arrive at the proper determination. Dr. Davidson stated that any limitation(s) will be identified and the information will be sent to licensee management, however the exact medical reason for such limitation(s) would not be explicitly stated and, if necessary, the accommodation of limitations will be addressed. Dr. Davidson added that there are strict controls in place to maintain the privacy and confidentiality of worker medical records, and that the College of Physicians and Surgeons imposes strong penalties for those who disregard privacy issues.

CNSC Staff-proposed Amendments to the Proposed REGDOC

124. To provide clarification in regard to the issues surrounding Section 4.1 of the proposed REGDOC, CNSC staff proposed on August 17, 2017, several amendments. CNSC staff added that the Commission could and would be kept informed regarding the progress of the implementation of the proposed REGDOC's specifications via the annual Regulatory Oversight Report.

125. CNSC staff provided the Commission with these suggested amendments to Section 4.1 of the proposed REGDOC, to further clarify which worker populations would be subject to which form of testing, after a break in the meeting.

126. The Commission noted the exclusion of the Certified Health Physicist (CHP) from pre-placement and random testing, and enquired about the role of a CHP during an accident. The OPG

representative, noting his previous experience as a CHP, provided an overview of the roles and responsibilities of a CHP, such as the review of high-hazard work plans. The OPG representative stated that the CHP ensures that the radiation protection programs at the site provide the appropriate amount of protection to workers at the site. The OPG representative reported that in an accident scenario, there would be a radiation protection member of the overall management team, however that individual is not required to be a CHP, and that the CHP is not a first responder. The Commission accepted the recommendation from CNSC staff regarding the exclusion of CHPs from the pool of SSPs that would be subject to pre-placement and random testing.

127. The Commission noted that the aforementioned amendments may affect the testing requirements for each work group as outlined in the proposed REGDOC. CNSC staff clarified that the certified workers (with the exception of the CHP), and the NRF were selected using risk analysis, and because those workers have the most immediate and direct impact on safety and security at the sites. CNSC staff added that certified workers (with the exception of the CHP) and the NRF would be subject to pre-placement, for-cause reasonable grounds, for-cause post-incident, random, and follow-up testing. NSOs, CHPs, ERT/Fire Brigade and designated non-NRF personnel would be subject to for-cause reasonable ground, for-cause post incident, and follow-up testing.

128. CNSC staff also suggested amendments to the proposed REGDOC under the "Guidance" heading of Section 4.1 for the Commission's consideration. CNSC staff suggested that the following statements could be added:

- "In addition, licensees may perform a risk-informed analysis to identify any other safety-sensitive positions."

- "Positions that are part of the minimum shift complement at high power reactor facilities may be considered as safety-sensitive."

CNSC staff also suggested that the sentence immediately following the aforementioned amended guidance could state:

- "The risk-informed analysis to identify safety sensitive positions may consider the following:"

129. CNSC staff further reported that it did not have sufficient time to review the cascading elements associated with these potential amendments, such as the requirements for medical testing, and that CNSC staff would revise the remainder of the document so that it

is in-line with these amendments. CNSC staff stated that the revised REGDOC would be provided to the Commission secretarially. CNSC staff added that discussions took place with the licensees regarding the determination of the SSPs to ensure that the amendments to the proposed REGDOC did not compromise safety at the sites. The OPG, Bruce Power, NB Power and CNL representatives were generally supportive of the amendments to the proposed REGDOC, stating that they seemed to be workable amendments.

Commission's Directives

130. After deliberating on the proposed REGDOC and the recommendations submitted by CNSC staff following the closure of the Commission meeting on August 17, 2017, the Commission provided the following directions to CNSC staff via the Commission Secretary:

- The Commission directed CNSC staff to split up the proposed REGDOC into two separate volumes. Noting that Volume I considered REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue*, was approved by the Commission during the December 2016 Commission Meeting, the Commission directed that

    1. Volume II would contain the information relevant to drug and alcohol testing with respect to fitness for duty. This included the provision that:

        a. Certified workers (with the exception of certified health physicists) and onsite NRF personnel are subject to pre-placement, for-cause, follow-up and random drug and alcohol testing

        b. Certified health physicists, nuclear security officers, designated non-NRF personnel, emergency response teams and fire brigade personnel are subject to for-cause and follow-up drug and alcohol testing

    2. An initial version of Volume III, to be presented for the Commission's approval in the near future, would provide for the remaining considerations related to medical, occupational fitness and psychological testing, with respect to fitness for duty for nuclear security officers only, as currently detailed in RD-363, but including an updated fitness test. Fitness for duty in this regard for additional positions is to be addressed at a later date, following the issuance of the initial version of Volume III.

- The Commission approved the amendments in Section 4.1 of the proposed REGDOC as currently drafted. The Commission also directed CNSC staff to further revise the proposed REGDOC with respect to all cascading changes to the REGDOC that are required due to those amendments.

- The Commission is of the opinion that the amended requirements and guidance for the designation of safety-sensitive positions is appropriate, and notes that for-cause testing is currently performed by the licensees.

- The Commission directed CNSC staff to bring Volume II of the amended draft REGDOC back to the Commission for its consideration, for the Commission to consider whether to approve the revised proposed REGDOC.

- The Commission also directed CNSC staff to present the complete volume of the proposed REGDOC addressing medical, occupational fitness and psychological testing for the Commission's consideration at a future Commission proceeding, which will be determined at a later date. The Commission recognizes that a phased approach to the implementation of the requirements of the proposed REGDOC is appropriate.

131. CNSC staff amended the proposed REGDOC as directed by the Commission. This revised REGDOC was provided to the Commission secretarially for its consideration. The Commission reviewed that document, and following further deliberations in a closed session on October 12, 2017, the Commission directed CNSC staff to make the following additional changes:

    - The Commission directed CNSC staff to amend Section 6.1 of the proposed REGDOC under "Guidance" to reflect the following:

      "If the initial alcohol test results in a BAC value greater than or equal to 0.02%, then a confirmatory test for BAC should be performed by a qualified individual".

    - The Commission directed CNSC staff to add definitions for the terms "shy lung" and "shy bladder" to the glossary of terms in the proposed REGDOC.

    - Should Volume III of REGDOC 2.2.4, *Fitness for Duty* be approved by the Commission, the Commission directed that the preamble for all three volumes be amended to reference each volume, and to explain the interdependency between

all volumes of REGDOC-2.2.4.

- The Commission directed CNSC staff to include the terminology that is used in all approved volumes of REGDOC-2.2.4, *Fitness for Duty*, in REGDOC-3.6, *Glossary of CNSC Terminology*[21], when it is next updated.

132. Following CNSC staff's completion of these further amendments to the proposed REGDOC, it was submitted to the Commission for its consideration. After reviewing that document, the Commission was satisfied with the amendments made to the proposed Volume II of REGDOC-2.2.4, *Fitness for Duty*.

133. The Commission expects that when draft REGDOCs are brought before the Commission for approval in the future, that they include additional information and references from the scientific literature, when appropriate.

Decision on REGDOC-2.2.4, Volume II

134. The Commission has considered the proposed REGDOC, which included the amendments that the Commission directed CNSC staff to make in this matter. The Commission approves regulatory document REGDOC-2.2.4, Volume II, *Fitness for Duty: Managing Drug and Alcohol Use*, for publication and use. **DECISION**

Regulatory Document REGDOC-1.1.3, *Licence Application Guide: Licence to Operate a Nuclear Power Plant*

135. With reference to CMD 17-M36 and CMD 17-M36.A, CNSC staff presented to the Commission REGDOC-1.1.3, *Licence Application Guide: Licence to Operate a Nuclear Power Plant*, for consideration and approval. This document sets out the requirements and guidance of the CNSC with respect to the submission of an application to the CNSC to obtain a licence to operate a Nuclear Power Plant (NPP) in Canada and explains the information required for that application. If approved, this document would be used to assess licence applications for proposed new NPPs and for licence renewals for existing NPPs. The use of REGDOC-1.1.3 is expected to lead to improved regulatory certainty for licensees and applicants, greater consistency in meeting regulatory requirements for the operation of NPPs, and greater transparency for the Canadian public and the international community with respect to the CNSC regulatory requirements and understanding them.

[21] CNSC Regulatory Document REGDOC-3.6, *Glossary of CNSC Terminology*, December 2016.

Comments from Licensees

136. The Bruce Power representative informed the Commission that the licensees believe that this is a good document and will be helpful during the processes for obtaining a licence and for renewing licences. The Bruce Power representative reported that their concern with this document is that CNSC regulations require specific information within a licence application, whereas the proposed REGDOC is structured within the Safety and Control Areas (SCAs) which do not necessarily align with the regulations. The Bruce Power representative provided two examples of where this potential issue could occur:

- Paragraph 3(f) of the *Class I Nuclear Facilities Regulations*[22] mandates the health and safety policies and procedures for a licence application, while in the proposed REGDOC it would be covered over six separate SCAs.
- Paragraph 3(1)(i) of the *General Nuclear Safety and Control Regulations*[23] (GNSCR) mandates the inclusion of the results of any test, analysis or calculation performed in support of a licence application, while in the proposed REGDOC those results would be covered over eight different SCAs.

The Bruce Power representative expressed the concern that following the guidance in the proposed REGDOC may cover all SCAs, but may not meet all the clauses of all applicable regulations. The Bruce Power representative added that this is particularly a concern for new, inexperienced licensees or applicants.

137. The Ontario Power Generation (OPG) representative reported that OPG was satisfied with this document and was appreciative of the efforts of CNSC staff to provide additional clarity and guidance with respect to licence applications. The OPG representative stated that CNSC staff provided OPG with a pre-application letter containing information similar to the information in this draft REGDOC, which has been valuable to the licence renewal application process that is underway for the Pickering NGS. The OPG representative echoed the concern that was voiced by the Bruce Power representative in that the proposed REGDOC should not leave anything uncovered, which could cause a problem for applicants or licensees during the licensing process.

[22] SOR/2000-204.
[23] SOR/2000-202.

138. The NB Power representative concurred with the statements provided by the Bruce Power and OPG representatives.

General

139. The Commission noted that the proposed REGDOC represents a means to convey the existing regulatory and licensing information in a more codified way. The Commission asked CNSC staff if it had performed a test run of the implementation of the proposed REGDOC, using a previously submitted application. CNSC staff responded that a full test run was not performed, however from CNSC staff's review of recent licence applications, it was seen that some of those applications were organized according to the SCAs, rather than the regulations. CNSC staff noted that the draft of the proposed REGDOC was sent to licensee representatives and has been used during licence application processes such as the aforementioned Pickering NGS licence renewal process.

140. The Commission noted that the proposed REGDOC would be used for licence applications for new facilities, as well as licence renewal applications for existing facilities. The Commission noted that it may be difficult to include both of these aspects into one document, as a new licence application would require a great deal more information than a licence renewal application, as there would already have been extensive work performed for an existing facility. The OPG representative noted that this was one of the comments that were submitted by OPG during the consultation process for the proposed REGDOC. The OPG representative stated that the proposed REGDOC does allow a licence application to reference existing documentation, such as those within the Licence Condition Handbook (LCH), and this was done as part of the Pickering NGS licence renewal application.

141. CNSC staff stated that the proposed REGDOC was intended to be a technology-neutral document and to allow for flexibility in the licence application process, which is the reason why the CSA standards are not directly referenced in the main body of the document. CNSC staff reported that the proposed REGDOC included information from a previous regulatory document, RD/GD-369, *Licence Application Guide: Licence to Construct a Nuclear Power Plant*,[24] which will be revised into a future REGDOC-1.1.3, Version 1. CNSC staff noted that information related to the design, safety analysis and management systems would have been submitted during the licence application process in order to obtain the original construction licence and/or

[24] CNSC Regulatory Document, RD/GD-369, *Licence Application Guide: Licence to Construct a Nuclear Power Plant*, August 2011.

operating licence, therefore that information may be re-submitted during the licence renewal process.[25] CNSC staff added that the proposed REGDOC highlights the flexibility of the licensing process, and that CNSC staff would expect that a licence application with respect to an operating facility would reference information that was already on the record.

142. The Commission noted that the proposed REGDOC was of good quality and was ordered logically. The Commission also noted that amendments were proposed with respect to the information on Aboriginal engagement in CNSC staff's presentation for the proposed REGDOC. The Commission asked CNSC staff about the requirements and guidance for Aboriginal engagement regarding licence renewals and licence applications for the construction of new NPPs. CNSC staff responded that REGDOC-3.2.2, *Aboriginal Engagement*,[26] sets out four requirements regarding Aboriginal engagement, and the first requirement is that the licensee or applicant must determine if the activities that are proposed would engage the Crown's duty to consult. CNSC staff explained that if that duty were engaged, then the applicant or licensee would provide CNSC staff with a report identifying Indigenous communities that were engaged, any issues that were raised, and timelines for addressing those issues, so that CNSC staff will have this information when CNSC staff begins its own Aboriginal engagement.

143. The Commission asked for comments regarding the concern raised by the Bruce Power representative with respect to the potential differences between the regulations and the references to SCAs in the proposed REGDOC. CNSC staff noted that this comment was received and discussed during a May 2017 workshop. CNSC staff reported that this issue is addressed in Appendix A of the proposed REGDOC, which outlines all of the regulations and maps them to each section of the document. CNSC staff stated that each section of the document also references the relevant regulations, therefore CNSC staff is of the view that all of the regulations are sufficiently addressed.

144. The Commission asked CNSC staff how it will keep the information in the proposed REGDOC up-to-date with respect to the regulations, SCAs, standards, as they will be revised and amended from time to time. CNSC staff stated that Tables C.1 and C.2 in the proposed REGDOC provide a baseline for what REGDOCs and/or CSA standards are applicable. CNSC staff stated that all REGDOCs are reviewed at least every five years and that this REGDOC could be reviewed on a more frequent basis if

[25] It is of note that section 5.5 of the *General Nuclear Safety and Control Regulations* specifies the requirements for an application to renew a licence.
[26] CNSC Regulatory Document REGDOC-3.2.2, *Aboriginal Engagement*, February 2016.

needed. CNSC staff indicated that Tables C.1 and C.2 do not contain version details for the REGDOCs and CSA standards as the versions are likely to change, however the overall structures of those documents are unlikely to change. CNSC staff added that any issues pertaining to new versions of the REGDOC and/or CSA standard would be dealt with in the exchange of information between the licensee/applicant and CNSC staff.

145. The Commission noted that the REGDOCs are evergreen documents and should be kept continuously up-to-date. If there is a perceived lack of clarity between the regulations and the REGDOC requirements, the licensee or applicant should alert CNSC staff in order to address any issue(s). The Bruce Power representative stated that licensees do engage in discussions with CNSC staff on CNSC staff's expectations regarding all requirements. The Bruce Power representative added that Bruce Power did not believe that the concern expressed above would prevent Bruce Power from implementing the proposed REGDOC.

146. Asked if it has been mandated that all licence applications are submitted electronically, considering the amount of documentation that is required for the submission, CNSC staff responded that the proposed REGDOC encourages the submission of documents in electronic format, including web-based formats.

Decision on REGDOC-1.1.3

147. After considering the recommendations submitted by CNSC staff, the Commission approves regulatory document REGDOC-1.1.3, *Licence Application Guide: Licence to Operate a Nuclear Power Plant*, for publication and use, with the amendments proposed by CNSC staff regarding Aboriginal engagement. **DECISION**

Event Initial Report (EIR)

148. With reference to CMD 17-M38, CNSC staff presented information regarding a release of untreated water at the Port Hope Project Long-term Waste Management Facility (LTWMF) on June 23, 2017.

149. CNSC staff conducted an on-site inspection at the LTWMF on June 26 and 27, 2017. CNSC staff concluded that CNL was treating the event seriously and was taking immediate actions to prevent another release of untreated water. CNSC staff identified deficiencies with respect to CNL's emergency preparedness and management of on-site water. CNSC staff issued an order requiring

CNL to submit to the CNSC a contingency plan and a documented water management plan. CNSC staff reported that CNL submitted the required information on August 11, 2017. CNSC staff explained that it was assessing the information submitted and would continue its compliance oversight to ensure CNL meets the conditions of the order.

150. The CNL representative stated that they were taking this event seriously, were taking all actions necessary to prevent recurrence, and that this event should have been prevented. The CNL representative added that there were no threats to, or impacts on, the health and safety of workers or the public.

151. The Commission enquired about lessons learned from the event and the actions taken to prevent recurrence. The CNL representative responded that the weather forecast was not as reliable as expected (approximately 60 mm of rain received compared to 10 to 15 forecasted) and that the equipment available for use during such an event was not sufficient. The CNL representative noted that CNL had augmented the necessary equipment for dealing with heavy rainfall since the event. The CNL representative also provided information about another lesson learned in regard to a construction culvert that overflowed and carried water to the collection pond, noting that CNL plans to review the site water management plans, increase the size of the water carrying capabilities and address silt-laden water.

152. The Commission asked for more details on the results of the off-site samples W01 and W02 described in the EIR. CNSC staff responded that they tested for both radionuclide and non-radionuclide substances, including radium-226, arsenic, and uranium. CNSC staff stated that it independently sampled the same locations on June 20, 2017and July 27, 2017, with the results showing that the radioactivity returned to normal results for that area and was within the range known to be safe for the protection of the environment.

153. Asked about the Ministry of Environment and Climate Change of Ontario's assessment (MOECC) of the event, the (MOECC) representative explained that they are generally satisfied with the actions taken in response to the event and that they concur with CNSC staff's assessment that no adverse environmental impacts resulted from the spill incident.

154. CNSC staff commented that they would provide an update on this event during the Port Hope Area Initiative update, planned for June 2018. **ACTION** by June 2018

Other Unplanned Events

CNL Class 4 Power Loss and Small Fire at the CNL Chalk River Laboratories Site

155. CNSC staff verbally informed the Commission about a loss of Class 4 power at the CNL Chalk River Laboratories (CRL) site on July 30, 2017. This loss of power from Hydro One also affected Petawawa, Ontario. CNSC staff explained that CNL brought up their backup power, initiated their Emergency Operations Centre, and notified provincial agencies, the Ontario Provincial Police and the Deep River Police Department about the event. CNSC staff posted the event on its website with a link to the CNL website.

156. CNSC staff also informed the Commission about a small bush fire caused by a downed power line that occurred away from the CRL site and that was immediately extinguished. CNSC staff stated that the site was never at risk, safety was never compromised and there were no impacts on human health, safety and the environment.

157. The Commission asked for the cause of the loss of power from Hydro One. The CNL representative responded that this loss of power was caused by a downed Hydro One line.

158. The Commission enquired about the amount of time that emergency power could remain activated. The CNL representative responded that different backups were available and described these backups. The CNL representative added that the National Research Universal (NRU) reactor had the most significant backup for emergency power, therefore the power came back instantaneously in that area. The NRU reactor has also made several improvements to the NRU reactor safety systems had also been made over the years, including electrical equipment. The CNL representative noted that the NRU was in safe shutdown during the event, and that the equipment did not experience any failure.

Injury at the McArthur River Uranium Mine

159. CNSC staff verbally informed the Commission of an incident that occurred on the morning of August 12, 2017 at the McArthur River uranium mine in Northern Saskatchewan where a worker accidentally lost the digital phalanx of the fifth digit of his left hand while installing piping underground. The work was immediately stopped and the piping machine was put out of commission. CNSC staff explained that the worker was flown to a hospital in Saskatoon to receive further care and was assigned to modified work duties until further notice. CNSC staff also stated

that Cameco was looking at the functioning of the piping machine as part of its investigation.

160. CNSC staff reported that Cameco had posted a summary of the event on its website and that CNSC staff had as well. The Cameco representative explained that the employee was experienced, had been doing this task for several years and that there was a safety card in place for the work and the individual.

161. CNSC staff stated that this was considered to be a reportable event and was expecting an investigation report from Cameco. CNSC staff noted its plans on following up with the Commission should any significant findings be found. **ACTION** by December 2017

Status Update on the Discovery of Radioactive Material at a Landfill Site in North Bay, ON

162. Regarding a status update on the July 14, 2017 discovery of radioactive metal at a landfill site in North Bay, ON that was provided in writing to the Commission before this Commission meeting, the Commission asked for clarification on the source of the radiation and its appropriate disposal. CNSC staff explained that as of the date of this Commission meeting, the nature of the material was still unknown, but that it contained radium-226.[27]

163. The Commission asked for clarification on the potential misunderstanding of units and therefore a more difficult evaluation of the severity of the event. CNSC staff responded that, when the Duty Officer received the call, the caller reported a reading of 700 rad per hour (7 Sv per hour). The Duty Officer recognized this situation as being potentially dangerous, but also acknowledged the possibility that there was a misunderstanding of the units from the caller. The Duty Officer was able to arrange for local first responders to find a gamma dose meter and make an initial evaluation of the situation.

164. The Commission enquired about the possibility for the CNSC to dispatch its own inspectors onsite to evaluate the situation and secure the source. CNSC staff responded that there were conventional health and safety issues related to source retrieval activity as the inspectors were not set up or prepared to enter the bins in the scrapyard. CNSC staff commented that lessons learned and recommendations regarding the sequence of events related to CNSC workers actions will be obtained.

[27] After the closure of this Commission meeting, the material was identified as a cable that was likely used in the instrumentation of a World War II aircraft. The Sudbury Star – *North Bay Radiation Mystery Solved*, September 20, 2017. < http://www.thesudburystar.com/2017/09/20/north-bay-radiation-mystery-solved >

165. The Commission enquired about reasons why the portal at the waste facility would be triggered by a dose lower than conditional release limits. CNSC staff explained that all waste management operators decided whether they wanted to use those limits with CNSC staff informing them that any readings below those limits would not be considered an issue by the CNSC. The Commission commented that this could cause undue public concern and that promotion of not setting detectors below those limits should be more aggressive. CNSC staff noted that this would be part of lessons learned and that they would try to find better ways of promoting this concept with waste management facility operators.

Closure of the Public Meeting

166. The public meeting closed at 4:54 p.m, with the Commission convening for a closed session to consider the matters raised for its decision. These minutes reflect both the public meeting itself, and record the decisions taken as a result of the meeting.

Charles Morcan
Recording Secretary

NOV 0 9 2017
Date

Recording Secretary

NOV 0 9 2017
Date

for S. Gingras
Recording Secretary

NOV 0 9 2017
Date

Secretary

NOV 0 9 2017
Date

APPENDIX A

2017-M-01	2017-02-10	5186292
Notice of Participation at a Commission Meeting and Participant Funding		
17-M31	2017-06-27	5285055
Notice of Commission Meeting of August 16-17, 2017		
17-M32	2017-08-02	5285449
Agenda of the meeting of the Canadian Nuclear Safety Commission (CNSC) to be held on Wednesday and Thursday, August 16 and 17, 2017 in Ottawa, Ontario		
17-M32.A	2017-08-09	5314980
Revised Agenda		
17-M34	2017-08-14	5316952
Status Report on Power Reactors		
17-M15	2017-06-16	5222255
Regulatory Oversight Report for Canadian Nuclear Power Plants: 2016		
17-M15.A	2017-08-08	5309342
Regulatory Oversight Report for Canadian Nuclear Power Plants: 2016 Supplementary Submission from CNSC Staff		
17-M15.B	2017-08-09	5272945
Regulatory Oversight Report for Canadian Nuclear Power Plants: 2016 Presentation by CNSC Staff		
17-M15.1	2017-04-07	5300454
Submission from Jane Beecroft		
17-M15.2	2017-07-14	5300572
Submission from JMH Technology Consulting		
17-M15.3	2017-07-07	5300616
Submission from the Canadian Environmental Law Association		
17-M15.4	2017-07-17	5300694
Submission from the Métis Nation of Ontario		
17-M15.5	2017-07-17	5300729
Submission from the Canadian Nuclear Workers' Council		
17-M15.6	2017-07-17	5300749
Submission from the Power Workers' Union		

CMD	Date	e-Docs No.
17-M15.7	2017-07-17	5300770
Submission from Northwatch		
17-M37	2017-08-01	5301207
Follow-up on the August 2016 Commission Proceedings on the Anonymous Letter Submission from CNSC Staff		
17-M37.A	2017-08-09	5315302
Follow-up on the August 2016 Commission Proceedings on the Anonymous Letter Presentation by CNSC Staff		
17-M37.1	2017-07-19	5315302
Follow-up on the August 2016 Commission Proceedings on the Anonymous Letter Presentation by Victor G. Snell, Consultant		
17-M35	2017-06-29	5291819
REGDOC-2.2.4, Fitness for Duty Submission from CNSC Staff		
17-M35.A	2017-08-09	5315414
REGDOC-2.2.4, Fitness for Duty Presentation by CNSC Staff		
17-M35.B	2017-09-25	
Revised REGDOC-2.2.4, Fitness for Duty Revisions provided as requested by the Commission		
17-M36	2017-08-01	5310757
REGDOC-1.1.3, Licence Application Guide: Licence to Operate a Nuclear Power Plant Submission from CNSC Staff		
17-M36.A	2017-08-09	5313596
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