Canadian Nuclear Safety Commission

Commission canadienne de sûreté nucléaire

Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held on August 20 and 21, 2014

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Canada

Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held Wednesday, August 20, 2014 and Thursday August 21, 2014, beginning at 9:00 am on both days at the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario.

Present:

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

M. Leblanc, Secretary
L. Thiele, General Counsel
M. Hornof, S. Dimitrijevic and B. Gerestein, Recording Secretaries

CNSC staff advisors were: R. Jammal, T. Jamieson, G. Rzentkowski, B. Poulet, F. Rinfret, , M. Langdon, P. Corcoran, K. Lafrenière, M. Santini, J. McManus, A. Viktorov, C. McDermott, G. Frappier, C. Harwood, M. Drolet, J. Jin, D. Sims, M. Couture, H. Harpell, D. Howard, M. Rinker, L. Sigouin, R. Awad, B. Torrie, A. Régimbald, H. Rabski, P. Matthews, P. Fundarek, P. Souligny, K. Mayer, J. Sandeman, K. Murthy, S. Faille, M. Thériault, P. Burton, B. Howden and W. Gibson

Other contributors were:

- Bruce Power: F. Saunders and D. Hawthorne
- Hydro-Québec: M. Désilets and J. Gaspo
- Ontario Power Generation Inc.: B. Duncan, B. McGee, S. Powers, R. Manley, J. Coles, M. Elliott, J. Vecchiarelli, I. Malek and P. Nadeau
- New Brunswick Power: P. Thompson, S. Granville and K. Duguay
- Office of the Fire Marshall and Emergency Management (Ontario): T. Kontra and T. Wieclawek
- Natural Resources Canada: P.K. Yuen
- Cliffs Québec Minière: S. Whiteford and C. Bertrand
- Sunnybrook Health Sciences Centre: M. Young and C. Caldwell
- CancerControl Alberta: P. Grundy and S. Lawrence
- Elekta: E. Hovenkamp and D. Bensen
- CSA Group: K. Fahey
- Acuren Canadian Operations: T. Levey

Intervenors:

- Ontario Ministry of Labour — CMD 14-M45.1
- Power Workers' Union — CMD 14-M45.2
- Sunil Nijhawan — CMD 14-M45.3
- New Clear Free Solutions — CMD 14-M45.4
- Michel Duguay — CMD 14-M45.5

Constitution

1. With the notice of meeting CMD 14-M37 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 19, 2014, Commission Member Documents CMD 14-M38 to CMD 14-M56 were distributed to Members. These documents are further detailed in Annex A of these minutes.

Adoption of the Agenda

3. The revised agenda, CMD 14-M38.A, was adopted as presented.

Chair and Secretary

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

Minutes of the CNSC Meeting Held June 19, 2014

5. The Commission approved the minutes of the June 19, 2014 Commission Meeting as presented in CMD 14-M39.

STATUS REPORTS

Status Report on Power Reactors

6. With reference to CMD 14-M40, which includes the Status Report on Power Reactors, CNSC staff presented updates as requested by the Commission at the June 2014 Meeting on the following:

   - Bruce Power manual shutdown, and
   - synthetic oil discharge at the Darlington nuclear generating station.

7. With regard to the Bruce Power manual shutdown, the Commission asked about the actions taken following the reactor trip at Bruce Unit 2 on June 13, 2014. The Bruce Power representative outlined the reasons for the reactor trip and noted that the response to the trip was procedure-driven and that there was nothing unusual in the shutdown itself or the response.

8. With respect to the synthetic oil discharge, this is a fire-resistant fluid for the turbine governing system. The main issue was determined by OPG to be one of sampling procedure. The level of contamination was at the low end of the detection limit and cross-contamination of sampling equipment was determined to be the reason for the readings that showed a leak. OPG informed the Commission that the issue has been resolved through the implementation of improved procedures.

9. The Commission also asked about the status of the Gentilly-2 reactor. CNSC staff informed the Commission that fuel has been removed from the reactor but that the reactor is not yet in a safe shutdown state since other reactor components and systems must be attended to as well. Staff noted that the safe shutdown should occur in approximately six months.

10. The Commission asked about the eventual dismantling of the reactor. The representative from Hydro-Québec noted that the preliminary decommissioning plans were submitted to the CNSC in 2011 and are being updated. The representative added that decommissioning the reactor is expected over a period of approximately 40 years.

11. The Commission asked about the issue of a crack found high on the cement structure of the reactor. The Hydro-Québec representative indicated that the issue is being investigated but is not a safety issue. CNSC staff confirmed that the issue is one of maintenance and not related to safety.

12. The Commission asked if Hydro-Québec has the appropriate technical expertise in place to decommission the Gentilly-2 reactor. The Hydro-Québec representative indicated appropriate staff is in place. The representative noted that most of the work would be conducted by Hydro-Québec staff with some work being contracted to outside firms.

13. The Commission asked about fuelling machine unavailability at the Pickering nuclear generating station. The representative from Ontario Power Generation (OPG) informed the Commission that there is a reliability issue with the fuelling machines and that OPG has in place a comprehensive fuel handling recovery plan that is addressing the issue. The representative added that the issue is not one of safety and that the root cause continues to be investigated. CNSC staff indicated that, upon its review of the root cause report, the Commission would be informed of new information, if any. CNSC staff reiterated that the issue is not one of safety but of reliability and economics for the licensee.

Event Initial Report (EIR)

Ontario Power Generation Inc.: Generator Seal Oil Release to the Environment at Unit 3 of the Darlington Nuclear Generating Station

14. With reference to CMD 14-M56, CNSC staff presented information regarding the release of seal oil to the environment from the Darlington Nuclear Generating Station that was discovered on August 6, 2014. CNSC staff noted that the leak was from a non-radioactive system at Darlington and that, once discovered, OPG took immediate steps to identify the source of the leak and to isolate it. CNSC staff noted that the total release is conservatively estimated as a maximum of 1500 litres and that the environmental impact of the leak was negligible.

15. The Commission asked about sampling of the cooling water. The OPG representative indicated that sampling was conducted weekly prior to this incident and is now undertaken twice a day.

16. The Commission asked about the inspection program for the heat exchangers and their replacement frequency. The OPG representative stated that all of the heat exchangers have been replaced on the other three units and that the Unit 3 heat exchangers were scheduled to be replaced in the spring of 2015. The Commission added a follow-up question on whether the leaks are occurring periodically. The representative indicated that the inspection program has revealed that the heat exchanger tubes require replacement earlier than expected and inspection techniques will be changed.

17. The Commission asked about the root cause for the failing heat exchanger tubes. The OPG representative indicated that while they suspect that an issue with flow accelerated corrosion is a possible cause, the root cause is not yet fully known and that OPG would submit a report to the Commission outlining the root cause and the measures taken to resolve the leaks. **ACTION** by October 2015

CNSC Staff's Response to the Mount Polley Incident in British Columbia

18. CNSC staff provided the Commission with an update on the break of a mine tailings containment dam at the Mount Polley copper/gold mine in British Columbia and its relevance to the CNSC. The Mount Polley mine is not regulated by the CNSC but, as a proactive regulator, CNSC staff wanted to ensure that a similar event at a CNSC-regulated uranium mine was considered by uranium mine operators. CNSC staff indicated that the CNSC requires licensees to have an annual geotechnical inspection of tailings facilities conducted by a qualified independent third

party. In addition to reviewing the reports submitted by the third party, CNSC staff conducts regular site inspections. CNSC staff stated that the risk of a dam failure at an above-ground tailings management facility at an operating uranium mine in Saskatchewan is not likely owing to the continuous regulatory oversight.

19. CNSC staff informed the Commission that uranium mine licensees have been directed to provide the Commission with a review of their tailings management facilities by September 15, 2014.

20. The Commission asked if CNSC staff's inspection program was new in light of the Mount Polley incident. CNSC staff responded that the inspection program is not new and has been part of the routine inspection program. CNSC staff outlined its inspection procedure and noted that it reviews reports submitted to licensees by independent geotechnical reviewers.

21. The Commission asked about the inspection program for uranium mines compared with other mines. CNSC staff responded that the uranium mines are inspected for health and safety as well as for environmental issues and that the provincial authorities and Environment Canada also conduct inspections of uranium mines. CNSC staff added that it is always looking for lessons learned from other facilities and for ways to enhance safety.

22. CNSC staff noted that the licensees' review of their facilities will be provided to the Commission at its October 2014 public meeting as part of the DNCFR Annual Report.

INFORMATION ITEMS

CNSC Staff Integrated Safety Assessment of Nuclear Power Plants for 2013

23. With reference to CMD 14-M45, CNSC staff presented its annual report, *"CNSC Staff Integrated Safety Assessment of Canadian Power Plants for 2013"* (2013 NPP Report), to the Commission. The report encompasses the results of CNSC staff's analysis of the safety performance of the Canadian nuclear power industry as a whole as well as the performance of each nuclear power plant, including Bruce A and B, Darlington, Pickering A and B, Gentilly-2, and Point Lepreau.

24. CNSC staff noted that the NPP report also provides the annual update to the Fukushima Daiichi Nuclear Accident Response, other risk enhancements undertaken by the industry, and the annual update on the Darlington new nuclear project.

25. CNSC staff provided a summary of the operation of each NPP during 2013. CNSC staff reported that all NPPs received SCA ratings of either "satisfactory" or "fully satisfactory." CNSC staff concluded, overall, that the Canadian nuclear industry remains a safe industry in terms of workplace safety, and protection of the public and the environment from radiological releases.

Comments by Licensees' Representatives

26. The Commission invited the nuclear industry to make a joint presentation on the CNSC staff report. The industry representative made a presentation on behalf of NPP operators following CMD 14-M54.

27. The representative focussed on the progress made on the implementation of lessons learned from the Fukushima accident. It was noted that:

- additional emergency equipment has been installed to respond in the event that previously installed backup equipment is not available;
- severe accident management guidelines have been issued at all NPPs;
- measures have been implemented to ensure containment integrity; and
- emergency preparedness enhancements are continuing both on site and off site.

28. The Bruce Power representative noted that the Fukushima response had been undertaken in two phases, one on preventing an event and the second on dealing with an event should one occur. The Bruce Power representative played a video for the Commission illustrating the changes made at Bruce A & B. The video is intended for public information and is available on the Bruce Power website.

29. The Bruce Power representative noted a number of areas where progress has been made in 2013 at the Bruce facilities. The representative stated that improvements in radiation protection, maintenance and station performance have been made.

30. The NB Power representative outlined the changes made at the Point Lepreau nuclear generating station in the area of accident prevention and response.

31. The NB Power representative expressed satisfaction with the CNSC staff's report. The representative indicated that 2013 was the first full year of operation since the refurbishment operation at the Point Lepreau station and noted that the NPP now has an integrated station business and improvement plan in place called "Navigating for Excellence."

32. The OPG representative provided a brief review of performance at the Darlington and Pickering NPPs. The representative noted, in particular, Pickering's excellent accident severity rate and low accident frequency, and the progress of Darlington's refurbishment program.

33. The Hydro-Québec representative expressed that the CNSC staff report is a rigorous and useful tool that enables each utility to compare itself with other facilities and to make improvements. The representative noted that upcoming years will be devoted to activities related to decommissioning the facility.

General Questions

34. The Commission enquired about the five-year dosimetry period to determine employee dose. CNSC staff responded that most NPPs use a rolling five-year period to avoid a situation where a dose could be maximized in a shorter period; the objective is to ensure that an employee does not exceed 1,000 mSv in a working lifetime. The Bruce Power representative informed the Commission that the practice is to manage dose in such a manner that an employee, from the date the employee begins work, is never in a position where that employee cannot work due to overexposure.

35. With reference to statistics on annual effective dose to workers at Canadian NPPs, the Commission asked about why the CNSC report shows a decline in the number of employees at NPPs. CNSC staff stated that many contracted workers were brought on strength for refurbishment activities at the Point Lepreau station and at Bruce Units 1 and 2, and these contracted workers are reflected in the statistics. These activities have now ended and as such there are less workers at these sites.

36. In light of the Fukushima follow-up activities, the Commission asked about procedures or processes that are in place to avoid accidents from events such as tornadoes. The OPG representative remarked that it is difficult to predict weather events that may cause a problem so the normal procedure would be to stop testing and to stay in a commercial quiet mode if a severe weather event seemed a certainty.

37. The Commission asked about the weighting factors used to determine the safety performance of the NPPs. CNSC staff outlined how the assessments are determined noting that some engineering judgment is included in the process. Staff meetings are held to ensure calibration and consistency in ratings.

38. The Commission enquired about determining the disposition of Fukushima action items. CNSC staff indicated that all Fukushima action items are to be completed by the end of December 2015. However, a small number of items may not be completed because of logistical issues such as requiring a station shutdown to complete an item.

39. The Commission noted that approximately 90% of Fukushima action items seem to have been completed yet less than half the funds to undertake the work have been expended, and asked if this was indeed the case. CNSC staff indicated that work to date has frequently been relatively straight forward and that much effort has been on planning and engineering, i.e., preparatory to the physical changes. CNSC staff added that going forward the implementation work will accelerate and that this will be significantly more costly.

40. The Commission enquired about the total amount spent by the NPPs to address the Fukushima Action Plan items. The industry representatives estimated that about $500M will have been spent upon completion and added that industry would spend whatever is required to meet the new safety requirements and will continue to strive for continued improvement over the years.

41. In response to a question from the Commission on future reporting, CNSC staff indicated that Fukushima action items will continue to be reported in the Annual NPP Report until their completion.

42. The Commission asked if staff had a target for the number of fully satisfactory ratings an NPP should have. CNSC staff reviewed the rating definitions and noted that there is no target, adding that licensees are expected to strive for excellence.

43. The Commission asked about the Canadian industry practice of sharing emergency equipment while the United States has a different practice based on site requirements. The Bruce Power representative noted that the difference is in the way the regulations are written which requires that each licensee in the United States meet its own obligations. The representative added, however, that there is a standardization of much of the portable equipment used at NPPs in the United States. With respect to international cooperation, the Bruce Power representative indicated that he was not aware of such discussions and added that reactors in the United States are of a different design from those in Canada. The Bruce Power representative noted that, in Canada, cooperative efforts are undertaken through the CANDU Owners' Group. The Bruce Power representative also indicated that the World Association of Nuclear Operators (WANO), through its Atlanta office, would assist in providing a coordinated response to a nuclear accident in North America.

44. The Commission sought clarification on the issue of communication during an accident. The Bruce Power representative commented that communication has two parts: internal and external. Internal communication is the responsibility of the operator and external, in the case of Bruce Power, is with the provincial government. The representative from the Office of the Fire Marshal and Emergency Management indicated that his organization is working with the communications industry to investigate cellular broadcasting to improve communication with the public and expects to have a pilot run in 2016.

45. The Commission considered written submissions relating to the CNSC staff Annual Report.

CMD 14-M45.1, Written Submission from the Ontario Ministry of Labour

46. The Commission enquired about the number of orders issued to OPG at Pickering, as reported by the Ministry of Labour (MOL). The OPG representative responded that the orders were related to providing information and were not orders to comply with a regulatory requirement. CNSC staff concurred with OPG.

47. The Commission asked about the definition of "critical" as the term relates to injuries at the Pickering and Bruce NPPs. The Bruce Power representative stated that these are severe injuries which would not include, for example, a broken finger. The Bruce Power representative added that the Bruce injury referred to in the MOL report was not, in fact, an injury since an employee collapsed due to a health problem.

48. The Commission asked about MOL visits to NPPs. CNSC staff responded that there is a memorandum of understanding (MOU) with the MOL on inspections and that the MOL is more active now than in the past regarding proactive inspections relating primarily to facility programs. MOL staff normally accompanies CNSC staff on these inspections. Reactive inspections are still conducted in response to an event or a request and are conducted by MOL without the presence of CNSC staff.

CMD 14-M45.2, Written Submission from the Power Workers' Union

49. The Power Workers' Union expressed support for the findings contained in the CNSC staff's report. The Union, in the written submission, also commented that it supports the use of internal procedures developed with licensees to address health and safety issues.

50. The Commission asked about the right of a worker to shut down work in the event of a safety issue. The Bruce Power representative clarified that a worker has the right to refuse unsafe work but that this has not occurred because issues get resolved before reaching this stage. The OPG representative stated that if a safety concern is raised, OPG has in place a process to deal with the issue. CNSC staff added that any work refusal would be reported to the CNSC through the MOL as part of the MOU.

CMD 14-M45.3, Written Submission from Dr. Sunil Nijhawan

51. Dr. Nijhawan provided comments regarding safety issues at Canadian nuclear plants with emphasis on severe accidents, their potential causes and proposed ways of addressing them.

52. The Commission asked CNSC staff about the estimation of the source term, particularly the methodology for beyond design basis accidents, as discussed in the submission. CNSC staff replied that they disagree with the intervenor's remarks noting that, in particular, source term assessments have been reviewed as part of both the environmental assessment and the deterministic safety analysis.

53. The Commission asked for the views of OPG on the issue of the software that the intervenor indicated he had developed and upgrades to the software. The OPG representative indicated that the software has been updated over the years and provides conservative outputs. The software, therefore, has been much improved from the time it was first developed.

54. The Commission asked about severe accident simulators for training operators. CNSC staff commented that simulators are only one part of the training regime that includes desktop reviews and guidelines for operators. CNSC staff outlined the difference between event-based simulation and symptom-based simulation.

55. The Commission enquired about public disclosure of information related to the Fukushima action plan. CNSC staff responded that the information is public as evidenced by today's public meeting, and can be obtained from the Commission. With respect to the audit pertaining to the process used to respond to Fukushima action items, the audit report will also be made public.

56. CNSC staff noted to the Commission that the intervenor's issues have been investigated by CNSC staff and that CNSC staff conclusions are different from those of the intervenor. CNSC staff noted that international research is considered as well as recent developments in the industry when addressing intervenor

comments. CNSC staff indicated that regulatory oversight is extensive and comprehensive. CNSC staff noted that other agencies and third parties also conduct oversight activities on the Canadian nuclear industry and remarked that all comments received on safety issues are seriously evaluated by CNSC staff and that a recommendation to change licence conditions may follow. The Commission is satisfied with this evaluation.

57. The Commission asked the industry representatives to comment on two issues, deuterium gas (D2) and the passive autocatalytic recombiners (PARs), and the overall issue of completion of Fukushima action items. The OPG representative indicated that he has met personally with the intervenor to address issues and added that OPG takes the intervenor's comments seriously and that the intervenor's comments have, in their opinion, been addressed. With respect to the PARs, the OPG representative outlined how OPG has effectively dealt with the issue of hydrogen generation. With respect to D2, CNSC staff outlined how the gas is adequately managed. The NB Power representative commented on the experience at Point Lepreau and concluded that in-vessel retention of D2 was the best approach to preventing the propagation of a severe accident.

58. The Commission noted a comment from the intervenor indicating that a comprehensive list of design items to reduce risk has not been developed and asked for CNSC staff comment. CNSC staff indicated that the Fukushima action plan constitutes a comprehensive list comprising issues raised by the intervenor, except for one that is considered incorrect, three that are not considered feasible and one issue raised that will be investigated. The Commission accepted CNSC staff's assessment.

CMD 14-M45.4, Written Submission from New Clear Free Solutions

59. The Commission asked for comments on intervenor remarks in the CMD that event reporting is not consistent between licensees. CNSC staff indicated that all licensees comply with regulatory requirements regarding reporting and disclosure, and that some licensees may decide to publish additional information or not, due to commercial sensitivity issues or security reasons. With respect to International Atomic Energy Agency (IAEA) submissions, CNSC staff stated that they are made publicly available. CNSC staff added that Site and External Events Design (SEED) mission reports prepared by the IAEA are also made public.

60. The Commission asked the OPG representative to comment on the intervenor's remark that Pickering had 70 fire code non-compliance reports. The OPG representative informed the Commission that increased surveillance accounts for the high number of reports. CNSC staff stated that the number of reports is a function of the size of the facility as well as the practice to report all issues, irrespective of their safety significance.

CMD 14-M45.5, Written Submission from Michel Duguay

61. The Commission asked CNSC staff to comment on the intervenor's statements regarding the integrity of feeder pipes in NPPs. CNSC staff outlined the requirements placed on licensees to implement an appropriate management and inspection plan for the feeder pipes and concluded that licensees have addressed safety concerns. CNSC staff stated that it has confidence in the continued operation of the feeder pipes.

Second Round of Questions

62. The Commission asked what NPP reviews are conducted in addition to those undertaken by the CNSC. CNSC staff and the Bruce representative indicated that NPPs conduct self-assessments, some of which are conducted by the World Association of Nuclear Operators (WANO), the Nuclear Energy Institute (NEI) and the Institute of Nuclear Power Operations (INPO). The Bruce Power representative noted that WANO, NEI and INPO reports are not made public.

63. In response to a question from the Commission on injury frequency, CNCS staff informed the Commission of the methodology used to portray lost time injuries, medically-treated injuries and fatalities and noted that data for the CNSC itself are included for comparative purposes.

64. The Commission sought clarification on the safety ratings and how they accurately portray facility operation in comparison with one another and with the world's best facilities. CNSC staff responded that it is working on making changes to future reports to better enable comparisons among Canadian facilities and with foreign reactors.

65. The Commission sought an update on CANDU safety issues research. CNSC staff informed the Commission that the safety issue pertaining to a loss of coolant accident is actively being discussed with industry and is not yet complete.

66. The Commission enquired about the independent panel report of November 2011 on shutdown system effectiveness and CNSC staff's response to it. CNSC staff informed the Commission that the industry was asked to comment on the panel's report and that CNSC staff expect to finalize their response shortly and make recommendations to the Commission.

67. The Commission asked about the CNSC's role in the MOU with Fisheries and Oceans Canada (DFO) pertaining to authorizations under the *Fisheries Act.*[1] CNSC staff indicated that the objective is to have a "one project, one regulator" approach and that CNSC staff would conduct the assessment and recommend a decision on an authorization from DFO as necessary. The Bruce Power and OPG representatives provided updates on their future work activities with a view of determining if authorizations under the *Fisheries Act* would be required, and noted that they are required to inform DFO of activities having a potential impact on fish.

68. The Commission asked about the change in the Darlington rating for 'Fitness for Service' that went down from "Fully Satisfactory" to "Satisfactory" in 2012. The OPG representative indicated that issues at Darlington relating to preventive maintenance completion, output and predictability of outages, as opposed to issues involving safety, likely contributed to the rating having been changed to "Satisfactory".

69. The Commission asked the OPG representative about the Sustainable Operations Plan (SOP) for the Pickering facility given that the facility is scheduled to cease commercial operation in 2020. The OPG representative indicated that the SOP is a requirement for plants in the last five years of planned operational life. The OPG representative noted that the plan is updated regularly and that OPG will continue to ensure safe plant operation. CNSC staff stated that it tracks the action log for the SOP and is satisfied with progress to date. CNSC staff added that an important issue is how licensee staff will perform as end of life of the facility approaches and that this issue is being closely monitored.

70. The Commission asked about issues with the management of contractors at OPG. The OPG representative remarked that the main issue was evaluating contractor work and ensuring that appropriate documentation of their work was in place. The representative added that setting expectations for contractors and monitoring against the expectations is being undertaken. CNSC staff informed the Commission that the licensee, in order to better supervise contractors, has assigned a staff member to oversee the work of a contractor and that this is working well.

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

71. The Commission asked the NB Power representative for clarification on the number of certified operators at the Point Lepreau facility. The NB Power representative indicated that the minimum requirement is to have six shift supervisors and that there are nine. With respect to the situation at the Gentilly-2 reactor, CNSC staff noted that the staffing situation will change owing to the change in status of the facility.

72. The Commission asked about the increase in public dose in the vicinity of the Gentilly-2 reactor. CNCS staff indicated that dose values remain well below regulatory limits and added that the increase is related to the shutdown activities at the station.

73. The Commission asked Hydro-Québec about planned work in the cooling bay at the Gentilly-2 reactor. The Hydro-Québec representative outlined the planned work to repair cracks in the bay which involves creating a safe working environment for divers in order to minimize radiation doses. CNSC staff expressed its satisfaction with safety measures taken by Hydro-Québec to protect divers.

74. The Commission enquired about the storage of heavy water from the Gentilly-2 facility. The Hydro-Québec representative indicated that arrangements have been made for the safe storage of the heavy water.

75. The Commission asked why maintenance completion rate at NPPs is not at the industry best practice rate of 90%. CNSC staff commented that numbers have been increasing over the last five years and generally close to 90%. The Bruce Power representative remarked that maintenance completion should not be viewed in isolation but as part of overall preventive and corrective maintenance programs. The Bruce Power representative indicated that overall plant performance is the key and there may not be a correlation between performance and the 90% maintenance completion level if the maintenance completed is not addressing the correct issues. The Bruce Power representative indicated that the ratio between preventive maintenance and corrective maintenance may be a more accurate indicator.

76. Following from the previous item, the Commission asked about the unplanned capability loss factor (UCLF) which appears higher than the rest of the world. The Bruce Power representative indicated that the UCLF includes the impact of extensions to planned outages and that this may adversely affect the statistics. The OPG representative added that the UCLF for Darlington was higher than it had been owing to extensions of planned outages. Analysis indicated that human performance, as opposed to equipment maintenance, was partly the reason. CNSC staff confirmed that planned extensions of planned outages may

contribute to the lower UCLF but that this can be beneficial to the operation of the NPP since issues get addressed in the ongoing outage and are not postponed to the next one.

77. The Commission asked about issues or concerns relating to station personnel's hours of work. The Bruce Power representative stated that the issue at the Bruce facility is more one of fatigue control and not of hours of work per se. The Bruce Power representative noted that programs are in place to monitor fatigue and studies are ongoing in relation to this issue. The Bruce Power representative also remarked that it is important to ensure that contractual employees are permitted to work enough hours to attract them and to keep them employed. Otherwise, the representative noted, contractual employees will work elsewhere and will not be available to the nuclear industry. CNSC staff noted that an important issue relates to getting more authorized staff at facilities and that Bruce Power has a plan to address this. CNSC staff indicated that this is a complex issue involving minimum shift complement, hours worked and maintenance, and that CNSC staff are closely following efforts at Bruce Power to address the issue.

78. The Commission asked industry representatives about training and testing of the highly qualified staff required at an NPP. The Bruce Power representative indicated that improved testing tools are being developed and that work is progressing in this regard. The Bruce Power representative added that testing employees for unplanned events is crucial and that MOUs exist with other utilities to share both knowledge and staff in this regard.

79. The Commission sought information on whether there is an issue with cabling at NPPs. The Bruce Power representative commented that cabling is not a problem but is an asset that needs to be effectively managed. The representative indicated that cables are replaced as required, depending on factors such as exposure to radiation and location.

80. The Commission congratulates CNSC staff on this very comprehensive report. The Commission recommends that the 2014 report be restructured so that there is only one section for each NPP, consolidating NPP Safety Performance and NPP Regulatory Developments information.

Presentation on Cradle to Grave: Fuel Management Story in Canada

81. With reference to CMD 14-M51, CNSC staff presented general information on nuclear reactor fuel management in Canada. The presentation encompassed an introduction on nuclear fission and radioactive decay, and an overview of the nuclear fuel cycle in Canada. CNSC staff described front-end (from uranium mining

to fuel fabrication and assembly) and in-core fuel management, with an emphasis on CANDU reactor fuel. The presentation also included the description of interim and long-term used fuel management (back-end fuel management).

82. The Commission enquired about radioactive contamination from uranium remaining in the tailings at mine sites. CNSC staff responded that most of the uranium is extracted from the ore and that the remaining concentration is so low that it does not represent a concern from an environmental protection perspective. CNSC staff noted that the mills were continually being updated and designed to ensure that uranium is not released as a waste. CNSC staff stressed that they were more concerned about nickel, cobalt and arsenic and less so with uranium and radioactivity from the tailings, which is well below safety levels.

83. The Commission asked staff to explain the implications of different designs and configurations of fuel bundles. CNSC staff explained the construction of bundles with different numbers of elements, and the influence of their configuration on water flow and heat transfer in the pressure tubes. CNSC staff also explained the importance of mechanical properties as a limiting factor to the number of elements in the bundle, and described modelling and testing performed to optimize heat transfer and energy output.

84. The Commission asked about on-line fuelling in CANDU reactors, and whether it still remains a competitive advantage over other reactors. CNSC staff reiterated that the advantage stems from the fact that a CANDU reactor does not have to shut down for refuelling, unlike other types such as light water reactors. CNSC staff pointed out that operators of other types of reactors had become more efficient at trying to minimize the length of time of an outage for fuel change.

85. The Commission asked about the frequency of fail fuel incidents. CNSC staff responded that the record is very good and that, on average in Canadian reactors, the records show one failure per year, per unit.

86. The Commission asked what fraction of a nuclear power plant's energy cost is a result of the fuel cost. CNSC staff responded that the fuel costs are very small compared to the overall costs given that CANDU reactors use natural uranium.

87. The Commission sought more information regarding the use of thorium as reactor fuel. CNSC staff responded that the idea of using thorium had been revived mostly due to the interest in China and India, stemming from their large reserves of thorium

and lack of uranium. CNSC staff explained that thorium itself is not fissile and needs a fissile material to start the chain reaction that would transform thorium into a fissile isotope of uranium, so that the process could continue. CNSC staff also explained that radiation associated with thorium-based reactor fuel is stronger than radiation from uranium-based fuel. Advantages or shortcomings of this technology could not yet be adequately judged since there are no operating plants based on it.

88. The Commission enquired about reactor fuel reprocessing. CNSC staff responded that China was collaborating with CANDU Energy Inc. to investigate the more efficient use of various types of fuel in the CANDU reactors that they have in China. CNSC staff explained that CANDU reactors are able to operate with both enriched and natural uranium fuel so that they can be used to reprocess used fuel from light water reactors. CNSC staff added that Canada does not have light water reactors and does not enrich uranium fuel for this type of reactors.

89. The Commission sought more information regarding the length of time that the fuel elements are kept in wet storage before being transferred to dry storage. CNSC staff responded that, when dry storage was introduced in Canada, the analyses had demonstrated that six-year old fuel, or older, can be safely stored into dry storage. The used fuel in dry storage is solid and will be completely contained for a period of several hundred years, or until a repository for long-term management becomes available.

90. The Commission asked about ageing of the concrete used for dry storage. CNSC staff responded that there is ageing management on dry storage concrete containers. As the concrete starts degrading and can no longer provide containment of the material, the used fuel can be retrieved and transferred under controlled conditions into a new container.

91. The Commission asked about the possibility to retrieve and reuse used fuel once it has been placed into a long-term management repository. CNSC staff responded that, during the operational life of a repository, there is always the possibility of retrieval; however, once the shaft to that repository is sealed, there is no intent on retrieval. The economy for retrieval would depend on the time the used fuel has spent in the repository and the decay rate.

92. The Commission asked about prolonged monitoring in the long-term repository after the shaft is sealed. CNSC staff responded that the operating monitoring instruments would remain in the sealed installation and that the surveillance period is, for the moment, foreseen for a period of 300 years.

93. The Commission instructed CNSC staff to adapt this presentation and make it available to the public more easily by having it translated and published on the CNSC's website. **ACTION** by December, 2014

Ontario Power Generation Inc. (OPG): Follow Up to Commission Request from the Pickering Nuclear Generating Station Hold Point Hearing

94. With reference to CMD 14-M42.1, OPG presented an update on the detailed risk improvement plan for Pickering Nuclear Generating Station (NGS), as directed by the Commission following the decision on the Pickering NGS hold point removal. In this update, OPG reported on the following:
    - improvements already implemented that have resulted in reduced risk;
    - physical and analytical improvements to be implemented; and
    - potential improvements to be further considered.

    OPG also provided a timeline for the further development and implementation of the whole-site PSA methodology.

95. OPG further reported on enhancements in the inspection and ageing management programs, status of pressure tubes, feeder pipes and evolution of safety margins as the operation approaches the planned end of life of the facility.

96. CNSC staff informed the Commission (CMD 14-M42) about its assessment of OPG's risk improvement plan for the Pickering NGS, ageing management of major pressure boundary components and evolution of safety margins. CNSC staff's review encompassed the implementation of physical improvements to the facility and improvements to PSA methodology. CNSC staff also reviewed the status of development of the whole-site PSA methodology.

97. CNSC staff stated that OPG has met the reporting requirements described in the Pickering Licence Conditions Handbook (LCH). Based on its review, CNSC staff found that OPG's risk improvement plan and the presented timeline for the development and implementation of whole-site based safety goals, as well as whole-site PSA methodology were acceptable. CNSC staff also stated that the current status of pressure tubes, feeders and steam generators was acceptable and that adequate safety margins were maintained.

98. The Commission sought more details regarding plans and timelines for the implementation of physical changes, and asked for potential implications of a cost-benefit analysis of the

improvement initiative. OPG representatives responded that OPG will complete all actions stemming from the Fukushima event, and provided a number of examples of practical improvements. The OPG representative stated that a cost benefit analysis of the planned improvements would be done by February 2015. The OPG representative added that, in parallel with the improvement planning, OPG was looking for the best method to calculate risk aggregation, which is the first phase of the multi-unit PSA initiative.

99. Regarding how OPG is meeting the safety goal limits and targets, especially when considering the fire hazard results, OPG representatives explained that OPG met all limits as defined and was over the target only for external hazards (fire and high winds). They stated that the values were over the limit only when obtained by simple summation, but that the risk aggregation was still under investigation, and that the risk would be further reduced with the implementation of the action plan. As discussed during the May 2014 Commission Hearing on the removal of a hold point at the Pickering NGS, CNSC staff noted that the CNSC had insisted on including in the probabilistic safety assessment (PSA) potential benefits of implementation of the emergency management equipment, particularly in the areas of fire protection and strong winds effects. As a result of this implementation, the estimated risks were reduced by factors ranging between two and ten.

100. The Commission enquired about the multi-unit pilot project for Pickering NGS and multi-hazard PSA methodology, and asked if a similar analysis would be done for Darlington and other NGS. OPG representatives responded that the whole site PSA embodies all units, all hazards, all operating modes and all other sources of potential radioactivity releases. The OPG representative noted that the experience obtained through the development of PSA methodology for Pickering NGS is instructive for Darlington NGS, and that the results would be presented to the Commission during the Darlington licence renewal hearing. CNSC staff concurred with OPG and stated that the lessons learned from the Pickering NGS will be applied to the Darlington NGS.

101. The Commission asked about the degree to which OPG can implement the risk mitigation strategies and complete the whole site PSA methodology within the given time frame. The OPG representative responded that the whole nuclear industry was involved in these research activities that have already resulted in a road map, the CANDU Owners' Group (COG) Report and collaboration with organizations from around the world. The OPG representative added that the first phase of the joint project with COG had been set, the first purchase order for planned

activities had been issued, and that the bids were evaluated. The OPG representative reiterated that this methodology was still under development worldwide and added that OPG believes that the adopted schedule was realistic and achievable. CNSC staff noted that, although the number of organizations capable of developing this methodology is limited, there was confidence internationally that the PSA methodology could be achieved as scheduled. CNSC staff added that the progress of the scheduled activities will be reported to the Commission on an annual basis.

102. The Commission enquired about the projected life span and safety margins regarding steam generator tubes. OPG representatives explained that the life span of the steam generator tubes is approximately 261,000 effective full-power hours (EFPH). Steam generators and heat exchangers are typically over-designed, so that it gives some margin for plugging. Based on a stress analysis and heat transfer capabilities, the determined margin for safe operation of each steam generator at Pickering NGS was about 500 plugged tubes on 2,750 tubes overall.

103. OPG representatives noted that a number of factors affect the steam generator tube life span, chemistry being an important one. OPG representatives pointed out that degradation mechanisms and chemistry involved are known and controlled better now than during the construction and early years of Pickering NGS operation, and that the collected knowledge was used to improve inspection, maintenance and life cycle management programs. The OPG representative stated that their estimates show that the steam generators and tubes at Pickering NGS will last far longer than the planned operation of the facility.

104. The Commission enquired about more frequent inspections, analyses and reports. CNSC staff stated that the CNSC had increased the number of inspections. CNSC staff plans to further increase the oversight in the area of human performance as the end of life for Pickering NGS approaches.

105. The Commission sought more information about periodic analyses that would be conducted to confirm the safety margins. CNSC staff responded that periodic analyses had started several years ago to account for the changes in key parameters related to aging. Depending on the type of analysis, they are conducted in intervals ranging from three to six years. The key parameters monitored are compared with the trends predicted for the given time interval. Corrective measures are taken to restore acceptable safety margins if necessary. CNSC staff stressed that this kind of analysis has existed since the beginning of regulatory oversight of the nuclear industry in Canada and has been regularly updated. This type of analysis must be conducted periodically and the

NGS operators have to bring all of these safety analyses up to date to be allowed to operate. During the last several years, efforts have been made to better quantify and analyze the effects of ageing.

106. The Commission asked about differences between oversight of newer and ageing nuclear power plants. The OPG representative used hydrogen uptake as an example for parameters monitored to assess the ageing of facility components, and stated that there is additional, more frequent, hydrogen sampling as a facility gets closer to its end of life. The OPG representative added that the information collected during the extended life of Pickering NGS will prove instructive for managing pressure tube ageing in CANDU reactors operating in other NGSs. CNSC staff added that certain parameters are measured more frequently for aged power plants. CNSC staff expressed its confidence that the current level of oversight, encompassing enhanced monitoring and more frequent inspections, is adequate.

107. The Commission asked whether all the feeders have been inspected for wall thickness at Pickering NGS. The OPG representative responded that all feeder tubes had been inspected at least once for the base-line data, and afterwards the lead feeders were monitored for the rate of thinning. The observed rate is compared with the rate predicted by a model developed for feeder tubes.

108. The Commission enquired about criteria for inspection frequency. The OPG representative responded that inspection results usually guide decisions about inspection frequency or scope of future inspections.

109. The Commission asked about the role, responsibilities and involvement of an authorized inspection agency. CNSC staff responded that the CNSC requires that licensees resort to an authorized inspection agency. In the case of pressure boundaries, the authorized inspection agency is the Technical Standards and Safety Authority. The authorized inspection agency, which is completely independent from the licensee and is authorized by the CNSC, reviews inspection results, reviews the design changes that were made and ensures that they meet all the codes. This agency has on-site resident inspectors that do the verifications, and work in close collaboration with CNSC staff and inspectors.

Presentation on Updated Program for Certifying Exposure Device Operators

110. With reference to CMD 14-M43 and CMD 14-M43.A, CNSC staff presented *Adoption of CSA PCP-09 for the Certification of Exposure Device Operators*. This Canadian Standards Association (CSA) Guide will replace CNSC Regulatory Guide G-229, *Certification of Exposure Device Operators*. To implement PCP-09, CNSC staff intends to propose licence amendments to the Commission for all licences issued for the purpose of conducting radiography. CNSC staff presented information on the previous certified exposure device operator (CEDO) certification process and how PCP-09 improves on G-229. CNSC staff further presented the roles and responsibilities of the CSA Scheme Committee members, the PCP-09 consultation process and how PCP-09 will be implemented throughout the non-destructive testing (NDT) industry.

111. The Commission enquired about the maximum allowable time frame that a trainee had to complete CEDO certification. CNSC staff responded that although PCP-09 does not contain specific time frames for certification, there is an expectation that candidates will proceed through the certification process fairly quickly, especially with the incentive of a higher rate of pay for CEDOs versus trainees.

112. The Commission enquired about the prerequisite level of knowledge for the new PCP-09 math test requirement. A representative from Natural Resources Canada (NRCan), the organization that supervises the testing, indicated that there is no prescribed minimum educational requirement and there is no intention to specify a minimum requirement at this time. The Canadian NDT certification system and the Canadian General Standards Board (CGSB) standard were both modeled after *ISO Standard 9712*, which does not have a minimum education requirement. The NRCan representative added that the math test questions are of high school graduate level, including several industry-related questions.

113. The Commission further enquired whether the math requirements were available to a trainee prior to starting the training process. CNSC staff explained that the trainees will be tested on the types of calculations that will have to be conducted in the field. The industry representative added that the math test was implemented because industry has had many challenges with CEDOs not performing required calculations properly and it will evaluate whether a trainee has sufficient knowledge to begin the CEDO vocational training.

114. The Commission asked for further clarification on the beta testing for the CEDO exam and why participation was low. CNSC staff detailed the validation steps needed for the CEDO exam, including beta testing. A representative from CSA further reported that beta testing is approximately 50% complete in order for results to be statistically sound. Live beta testing of the examination with exposure device operator (EDO) trainees will begin on November 1, 2014. The industry representative advised the Commission that since it was not a certification requirement, asking CEDOs to take time off to write the exam was difficult, leading to a low number of CEDOs participating in the beta testing. CNSC staff explained that CSA completed the validation of the CEDO exam, which ensures that candidates who pass the exam have the proper knowledge to be a CEDO. CNSC staff reviewed the exam validation and confirmed that the examination is valid.

115. The Commission expressed concern that the CEDO exam was a work in progress and that multiple exams were not available. CNSC staff assured the Commission that the current 148-question exam is a valid exam. When enough candidates have completed the 148-question exam to generate statistically-significant data, CSA will develop multiple sets of shorter exams using the current question bank.

116. The Commission enquired as to whether recertification is an incentive for CEDOs to take the exam. The industry representative stated that it was. CSNC staff added that trainees will be required to take the new exam beginning March 1, 2015. Those exam results will be a part of the live beta testing. It is estimated that multiple, shorter exams will be available in 2016.

117. The Commission asked industry representatives to identify the challenges that they see with the implementation of this certification process. Although the industry representative acknowledged that the bank of questions is very good and far exceeds the quality of questions for the previous CEDO exam, a 148-question exam is too long. The industry representative added that it would be more reasonable to have only 80 questions on the exam at the time that it is implemented.

118. The Commission enquired about whether the five-year renewal period for CEDOs would pose a challenge for industry. The industry representative responded that industry welcomes the requirement as it will prevent CEDOs who have not worked in industry for a number of years and potentially lack the skills required from being employed as CEDOs.

119. The Commission requested additional details on how the practical testing required by PCP-09 will be carried out by industry. CNSC staff responded that the expectation is that EDO trainees will be tested on the equipment that they will be using in the field and that the practical test may vary between companies. The industry representative disagreed with CNSC staff regarding possible practical test variances, stating that the new practical test is very structured in PCP-09. This structure was requested by industry to ensure that EDO trainees' competence was tested on a practical scale.

120. The Commission enquired about the number of times an EDO trainee could fail the test. CNSC staff responded that there was no limit; however, it was expected that if a trainee failed multiple times, they would seek additional training prior to re-testing. The industry representative noted that the number of times an EDO trainee could fail is written into PCP-09, but CNSC staff clarified that it is a guidance document, not a standard or legal requirement.

121. The Commission requested clarification on what testing was required of CEDOs for recertification. CNSC staff responded that if a CEDO had been actively working in the industry, he/she would have to complete 40 hours of continuous training and the practical test. The Commission further enquired as to what measures would be taken if a CEDO did not pass the practical exam. The industry representative responded that the CEDO would have to undergo additional training.

122. The Commission enquired about who covered the CEDO training costs. CNSC staff responded that either the individual seeking certification or the employer paid the associated fees. The Commission further enquired as to the total cost of training. CNSC staff responded that certification was $1,000, the exam was $250 to $300, and that the cost of vocational training varied by provider.

123. CNSC staff explained to the Commission that the plan for implementation of the new certification process, outlined in PCP-09, in licences would involve the Commission amending licences on its own motion, after providing affected licensees the chance to make submissions on the proposed change. The Commission expects this process to proceed efficiently as soon as possible, and instructs that the process for section 25 NSCA amendment begin.

Presentation on Financial Guarantee Requirement for Nuclear Substances, Prescribed Equipment and Class II Nuclear Facility Licensees

124. With reference to CMD 14-M44 and CMD 14-M44.A, CNSC staff presented *Financial Guarantee Program for Nuclear Substance, Prescribed Equipment and Class II Nuclear Facility Licences*. CNSC staff presented the progress that has been made towards the implementation of financial guarantees for these types of licences and the evolution of the CNSC insurance financial guarantee program. CNSC staff emphasized that the CNSC insurance program did not remove the licensees' regulatory obligations to safely terminate licensed activities.

125. The Commission expressed satisfaction that CNSC staff developed an innovative model for financial guarantees. The Commission enquired whether the CNSC insurance program presented any risk to the CNSC. CNSC staff responded that this program will reduce the financial liability facing the CSNC for situations when a licensee cannot safely terminate licensed activities. CNSC staff also gave examples of how the program represents minimal financial risk to the CNSC.

126. The Commission further enquired about the required licensee adoption rate for the program to move ahead. CNSC staff responded that the insurance policy was an agreement between the CNSC and the insurance company at a fixed fee. Licensees opting to contribute toward the cost of CNSC insurance coverage will be considered to have met the financial guarantee requirement of their proposed new licence terms and conditions. CNSC staff further noted that the CNSC insurance program was financially attractive for licensees and that a lack of participation was not expected. CNSC staff did, however, acknowledge that if licensees chose an alternate option for the financial guarantee in order to comply with their licence conditions, the CNSC would still be required to pay the full insurance premium.

127. The Commission asked about alternate financial guarantee options and why a licensee may choose to opt out of the CNSC insurance program. CNSC staff provided examples of alternate, and generally more costly, financial guarantee options and emphasized that any alternate financial guarantee options have to be approved by the CNSC. CNSC staff also discussed an example of a licensee for whom the CNSC insurance program may prove to be less attractive but emphasized that this situation represents a very small minority.

128. The Commission enquired whether the assumption that public institutions and municipalities will not default on their responsibilities to safely terminate licensed activities was reasonable. CNSC staff explained that public institutions are aware of their regulatory obligations and have the resources available to fulfill them. Therefore, it is a reasonable assumption. The Commission further enquired whether a public institution could opt into the CNSC insurance program. CNSC staff stated that they could.

129. The Commission further enquired about how public institutions will provide the CNSC with a financial guarantee. CNSC staff responded that generally, a political recognition of the financial liability associated with their regulatory obligations to safely terminate licensed activities, is considered sufficient by the CNSC.

130. The Commission raised a concern that the availability of the insurance program could encourage licensees to not fulfill their obligations to safely terminate licensed activities. The Commission also asked whether the insurer considered this an additional liability. CNSC staff responded that while it was a possibility, they did not anticipate this to be a problem. Licensees are aware of their regulatory obligations and know that the CNSC would use the provisions under the insurance program only after regulatory actions would be exhausted.

131. The Commission enquired about how the licensee contributions to the CNSC insurance program will be calculated. CNSC staff responded that fee-paying licensees' contributions would be prorated based on a licensee's individual financial guarantee requirement over the sum of the value of financial guarantee requirements for all fee-paying licensees. Contributions, based on the licensee's inventory, will be reviewed regularly.

132. The Commission asked whether the financial guarantees of any licensees exceeded the one million dollar coverage limit. CNSC staff responded that there were four licensees with larger financial guarantees. The Commission expressed a concern that the CNSC would be liable for any amounts over the coverage limit. CNSC staff acknowledged that while this is a concern, these four cases were evaluated and the risk of default on obligations is low. CNSC staff also noted that there is an additional coverage of $250 000 for temporary storage of reclaimed nuclear substances, and that this amount would reduce the CNSC liability risks.

133. The Commission expressed its satisfaction with the CSNC insurance program and indicated that they would like CNSC staff to move forward with the plan for licence amendments to require financial guarantees, under section 25 of the NSCA, in a manner as informal and expeditious as the circumstances permit, while respecting the CNSC's process for giving licensees an opportunity to be heard.

Update on the Cliffs Quebec Iron Mining Limited Incident Involving Potential Overexposure to Workers

134. With reference to CMD 14-M46, CNSC staff presented an update on the Cliffs Quebec Iron Mining Limited (Cliffs Iron Mining) incident which was initially presented at the Commission Meeting in March 2014. Since the initial report, CNSC staff has been working with Cliffs Iron Mining to determine the cause of the incident and to modify procedures to prevent a similar incident from reoccurring. The Cliffs Iron Mining licence has been amended to include the new procedures. Because of this incident, CNSC staff has reviewed the licences of 240 licensees possessing fixed gauges with the intention of amending them to include new procedures for using fixed gauges. CNSC staff stated that although the order that was given to the company in March 2014 is still valid, it is satisfied with the efforts of Cliffs Iron Mining in closing the remaining actions associated with the order. CNSC staff plans to conduct an inspection at the company's site in the fall of 2014.

135. The Cliffs Iron Mining representative assured the Commission that the company is taking the incident very seriously and has so far implemented all measures requested by the CNSC. The Cliffs Iron Mining representative also emphasized that the health and safety of employees and contractors is a primary core value of the company.

136. The Commission enquired whether employees at Cliffs Iron Mining were aware of, and trained on, work procedures. The Cliffs Iron Mining representative responded that employees are trained every three years in radiation protection and procedures.

137. The Commission asked how the employees reacted after the incident. The Cliffs Iron Mining representative indicated that they were dismayed that employees had not followed the procedures and work checklists.

138. The Commission directed CNSC staff that during the fall 2014 inspection, Cliffs Iron Mining employees will be questioned on their familiarity with work procedures. CNSC staff assured the Commission that they will verify training programs and will conduct interviews with employees as well as radiation safety officers (RSOs). The Commission further instructed that the fall 2014 inspection be unannounced. CNSC staff responded that they have several options for conducting unannounced inspections. The Commission also enquired about the date of the last inspection at Cliffs Iron Mining. CNSC staff responded that the last inspection at that site was approximately two years ago.

139. With respect to the new licence conditions resulting from this incident, the Commission enquired about whether they will be imposed on all applicable licensees and whether CNSC staff has received feedback from them. CNSC staff responded that it is their view that the 240 applicable licences should be amended to include the new conditions. Additionally, feedback from the licensees was positive since 220 out of 240 of the licensees were already compliant with the new conditions.

140. The Commission requested additional information about the fixed gauges involved in the incident. Cliffs Iron Mining advised the Commission that the open/closed positions are visible on the gauges but workers did not follow procedures to ensure that they were in the correct positions before locking them. The Cliffs Iron Mining representative also confirmed that their computer system verifies gauge position. Although using this computer verification system was not part of the procedures when the incident occurred, this has been implemented in the new procedures.

141. The Commission enquired whether this incident was discussed with the joint health and safety committee. The Cliffs Iron Mining representative responded that the workers involved in the incident participated in the committee's monthly meeting and spoke about the errors that were made.

142. The Commission enquired about the worst case exposure scenario for this incident. CNSC staff responded that exposure is a factor of time and proximity to the gauge. The Cliffs Iron Mining representative added that since the open gauges were discovered on the last day of work being done in that area, workers were likely exposed to the maximum dose possible.

143. The Cliffs Iron Mining representative emphasized to the Commission that the new procedures in place, combined with the improved locking mechanism on the fixed gauges, should prevent a reoccurrence. CNSC staff concurred with the effectiveness of these measures in preventing a reoccurrence of the incident.

Update on the Incident at Sunnybrook Research Institute Involving the Loss of Controlled Sealed Sources

144. With reference to CMD 14-M47, CNSC staff presented an update on the incident at Sunnybrook Health Sciences Centre (SHSC) and the Sunnybrook Research Institute (SRI) involving the loss of 25 sealed sources. After an inspection and a meeting with the licensee, a CNSC Designated Officer issued an order on May 1, 2014. The actions in this order are nearly completed. Additionally, an Administrative Monetary Penalty issued to SHSC was paid in full. CNSC staff concluded by stating that the licensee addressed all of CNSC staff's concerns in a satisfactory manner, leading to the termination of CNSC regulatory action against the licensee.

145. A SHSC/SRI (collectively Sunnybrook) representative assured the Commission that Sunnybrook takes safety, including nuclear safety, seriously. The Sunnybrook representative added that CNSC staff's update to the Commission was accurate and that Sunnybrook has gone above and beyond the CNSC order to ensure increased sealed source inventory control and security, as well as increased radiation safety.

146. The Commission requested additional information regarding the missing sources. The Sunnybrook representative advised the Commission that approximately 20% of their sealed sources, not including brachytherapy sources, were reported as missing in March and April 2014. The Sunnybrook representative added that since the incident, Sunnybrook has removed sources that they no longer need from their inventory in an effort to reduce the risk of sources being lost.

147. The Commission enquired about the current storage of sealed sources. The Sunnybrook representative responded that they are stored in heavy lock boxes in two secure locations. A fixed, swipe-card accessible storage cabinet will be installed in one of these locations. The Commission further enquired about whether SHSC and SRI had common storage for their sealed sources and how many employees had access to these locations. The Sunnybrook representative responded that SHSC and SRI now have only two common, secure storage locations. The

Sunnybrook representative also stated that two employees have access to sealed sources used for research and 14 employees have access to calibration and quality control sources. In addition, approximately 15 employees have access to the brachytherapy sources.

148. The Commission enquired about the procedures that Sunnybrook uses for inventory control. The Sunnybrook representative responded that a log book is used to sign sources in and out of the secure storage locations. Additionally, with new security features including security cameras and swipe card technology, all activities in the secure storage locations will be time-stamped, recorded and logged.

149. The Commission asked about the training that contractors receive when they are working in secured storage locations. The Sunnybrook representative responded that contractors do not receive any training since they are not allowed in those areas unsupervised. Additionally, facilities planning staff has been advised that contractors working in any radioisotope areas must be supervised by a Sunnybrook employee who has radiation safety training.

150. The Commission enquired whether any of the actions in the order to Sunnybrook resulted in, or will result in, changes to regulatory requirements for licensees. CNSC staff responded that many of the actions are captured in existing regulatory requirements. CNSC staff added that ensuring the effectiveness of training programs may become a part of the licensing and compliance verification processes.

151. The Commission requested additional information with respect to the two sources that were found to be missing during the April 2014 CNSC inspection. The Sunnybrook representative responded that they were likely inadvertently discarded with other radiological waste.

152. The Commission enquired about RSO duties at both institutions. The Sunnybrook representative responded that SHSC and SRI have a common corporate RSO who oversees radiation safety at both institutions. In addition to the corporate RSO, each institution has its own RSO and assistant RSO.

153. The Commission requested more information on the licences issued to both SHSC and SRI. CNSC staff provided information about the licensed activities at each site and the licences that were required to conduct these activities. The Commission is satisfied that this matter has been appropriately addressed.

Update on the Incident at the Cross Cancer Institute Involving Sealed Sources Found in a Machine Shop

Note: Commission Member Dr. McEwan excused himself from the Commission's consideration of this matter.

154. With reference to CMD 14-M48, CNSC staff presented an update on the incident involving two cesium-137 sealed sources, in the form of pins, found in a machine shop at the Cross Cancer Institute (CCI), a branch of Alberta Health Services (AHS), in April 2014. The unauthorized transfer of these sources from safe storage to a machine shop resulted in radiation doses to workers, which, although below regulatory limits, were considered significant. A Designated Officer order with multiple corrective actions was issued to AHS in May 2014. CNSC staff noted that the licensee is demonstrating a genuine commitment to addressing the corrective actions related to this incident. CNSC staff will conduct compliance inspections of the facility when the corrective actions are completed.

155. The AHS representative advised the Commission that they are feeling fortunate that the consequences of the incident were not more severe. Additionally, the incident has allowed AHS to recognize that some of their procedures were not as effective as they had previously thought. The AHS representative also stated that this incident has allowed them to identify excess nuclear substance inventory resulting in a review of their inventory and transfer procedures.

156. The Commission enquired about the potential severity of the incident. The AHS representative responded that because the pins were not immediately recognizable as radioactive sources, they felt fortunate that the doses to workers were not higher. Additionally, AHS recognized that the sources could have been removed from CCI premises and inadvertently given a high dose to a member of the public.

157. The Commission asked whether any other misplaced sources have been found. The AHS representative stated that they have conducted a full physical check of their inventory, as well as a radiation survey of the entire CCI, and no other misplaced sources have been found.

158. The Commission enquired whether performing inventory reconciliation on a regular basis was a regulatory requirement. CNSC staff responded that a physical check of sources in a licensee's inventory must be reported in their annual compliance report. CNSC staff added that although AHS performed these

inventory checks and submitted the compliance reports, this incident occurred because it was thought that the sources were transferred for safe disposal when in fact they were not. The AHS representative concurred with CNSC staff and added that this incident exposed a deficiency in their inventory control process. The Commission asked whether CNSC staff was satisfied with the current regulatory requirements for inventory control. CNSC staff responded that they were satisfied.

159. The Commission asked for more information on the frequency of radiation surveys at the CCI. An AHS representative responded that surveys are not routinely performed in clean areas such as the machine shop. The AHS representative added that because of this incident, they are looking at performing routine surveys in clean areas, with frequency dependent on the risk associated with an area.

160. The Commission enquired about the determination of the length of time that the sources were in the machine shop. The AHS representative responded that extensive calculations and modelling were performed, based on the radioactivity of the sources and the doses received by the workers in the machine shop. The Commission further enquired how the sources would have been found had the radiation survey not been done. The AHS representative responded that the workers' dosimetry badges are read quarterly and would have shown higher than normal doses, identifying a problem in the machine shop.

161. The Commission asked how many actions in the order have been completed. CNSC staff responded that AHS submitted all of the requested information on the specified dates and that the employee radiation safety training is nearly complete. CNSC staff added that, as a result of the incident, AHS trained not only the employees at the CCI, but all of the employees covered by AHS. CNSC staff expressed satisfaction in the extensive training that AHS has provided. The Commission is satisfied with the measures taken in this matter.

Update on the Incident Involving a Flexitron High Dose Rate Brachytherapy Unit

162. With reference to CMD 14-M49, CNSC staff presented an update on the incident involving iridium-192 contamination on an Elekta Flexitron high dose rate brachytherapy unit. After the initial incident was reported, a second Flexitron unit was found to be contaminated as well. No workers at the radiation therapy centres or members of the public were exposed to contamination due to these events. In mid-August, Elekta submitted a root cause

analysis report to the CNSC. This report will be reviewed by CNSC staff and they will follow up with Elekta to monitor the implementation of corrective actions. CNSC staff is satisfied that all of the actions taken by Elekta will be effective in preventing a reoccurrence of these incidents. Elekta representatives concurred with CNSC staff's summary.

163. The Commission asked whether not performing contamination checks prior to loading the source was a global practice. The Elekta representative stated that while one Flexitron model already had this check built into its maintenance procedures, the model involved in this incident did not. The procedures have now been modified to include contamination checks during both source loading and unloading.

164. The Commission enquired about the source of the iridium-192 contamination. The Elekta representative responded that the contamination came from the supplier and assured the Commission that the therapy sources were not compromised and only contaminated externally.

165. The Commission asked whether Elekta had reports of contamination on any other Flexitron units globally and what type of follow-up Elekta has done to correct the problem. The Elekta representative responded that they have had 13 reports of contamination worldwide. Multiple corrective actions have been taken including putting a hold on the production of the therapy sources, issuing a notice to users and service engineers, and eliminating the original source of contamination. The Commission expressed satisfaction that Elekta acted so quickly on a global scale.

Update on the Incident Involving Four Uranium Hexafluoride Cylinders at the Port of Halifax

166. With reference to CMD 14-M55, CNSC staff presented an update on the incident involving four uranium hexafluoride (UF_6) cylinders which was presented to the Commission in March 2014. CNSC staff presented responses to three questions that were asked at the March 2014 Commission Meeting and stated that a root cause analysis of the incident is being performed by various stakeholders. CNSC staff is satisfied that the UF_6 cylinders performed appropriately during the incident and that there were no consequences to their integrity from the drop. The Commission expressed satisfaction with CNSC staff's update.

167. The Commission enquired on improvements to CNSC procedures with respect to attendance at radiological incidents. CNSC staff responded that as a result of lessons learned, procedures have been improved and that the CNSC response to radiological incidents will now include a public information component. The Commission expressed that having a CNSC expert at an incident as early as possible is important.

168. The Commission asked how the root cause analysis of the incident would be communicated to the public and to the Commission. CNSC staff responded that the analysis is being conducted by marine surveyors contracted by the parties involved in the incident. Results from the investigation will be communicated by CNSC staff to the Commission and to the public. CNSC staff added that since the UF_6 cylinders were not directly involved, the CNSC no longer has regulatory involvement in this incident.

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169. The Commission enquired about the progress of improving first responder training during radiological incidents. CNSC staff responded that the CNSC First Responder Training Program has been updated using lessons learned from this incident and that the new curriculum was successfully used for the first time in August 2014.

170. The Commission requested further information about the UF_6 cylinders and the flatrack involved in the incident. CNSC staff responded that the flatrack was not contaminated and was disposed of in a scrapyard in Halifax. The empty overpacks were returned to the manufacturer in the United States and the UF_6 cylinders were repackaged and returned to the consignor in the United Kingdom.

Information About Abandoned Fixed Nuclear Gauges in Loyalist Township, Ontario

171. CNSC staff presented information regarding the recovery of two abandoned Texas Nuclear fixed gauges in Loyalist Township, Ontario. The gauges each contain 1.85 GBq of cesium-137. The gauges were used by Envirofuels, who was previously issued a CNSC licence authorizing the use of the gauges. The company abandoned the gauges when it ceased operation and they were consequently recovered by the CNSC with assistance from the Loyalist Township Fire Department on July 31, 2014. The gauges are currently at the CNSC laboratory in Ottawa.

172. The Commission enquired about the value of the gauges. CNSC staff responded that these two gauges have no significant value and will be safely disposed of.

173. The Commission asked whether the planned CNSC insurance program presented in CMD 14-M44 could be used in this situation. CNSC staff indicated that the proposed insurance program would be applicable in similar situations since licensees possessing fixed gauges will, in the future, have to provide the CNSC with a financial guarantee.

174. The Commission enquired about further actions being taken by CNSC staff. CNSC staff indicated that it does not intend to provide further updates on this situation since provisions are being made to dispose of the gauges at Chalk River, Ontario.

175. The Commission requested clarification on the obligations of a licensee when abandoning nuclear gauges. CNSC staff indicated that under the *General Nuclear Safety and Control Regulations,* a licensee is obligated to report to the CNSC when there is an impending bankruptcy or abandonment of nuclear substances. CNSC further stated that during licence renewals, an applicant authority must now confirm that they are in a position to be aware of impending bankruptcy or litigation against the company, and must provide government-issued identification.

Update on Regulatory Document RD-336, Accounting and Reporting of Nuclear Material

176. With reference to CMD 14-M41, CNSC staff presented *Update on Regulatory Document RD-336, Accounting and Reporting of Nuclear Material*. This presentation is a follow-up to the January 2013 Commission request to provide an update on the implementation of RD-336. CNSC staff presented information about the online reporting software – Nuclear Materials Accounting Reporting (NMAR) – and how it can be used by licensees to submit reports to the Nuclear Materials Accountancy System (NMAS). CNSC staff also discussed planned amendments to RD-336, namely requiring the use of NMAR by all applicable licensees.

177. The Commission requested further information on how the reports were processed after they were submitted through NMAR. CNSC staff responded that the reports are transferred to NMAS as well as CNSC's document repository, eAccess. After validation of the licensees' reports by CNSC staff, NMAS will generate the CNSC reports to be provided to IAEA.

178. The Commission enquired about feedback from licensees on NMAR. CNSC staff responded that feedback from licensees has been positive and provided examples of the feedback that has been received.

179. The Commission enquired about how many licensees were currently submitting their reports through NMAR. CNSC staff responded that approximately 8 smaller licensees are submitting their reports through NMAR, representing approximately 1% of the reports received annually. CNSC staff added that although it is a small percentage of the reports received, this has allowed for testing of the software without an overwhelming quantity of data.

180. The Commission asked about the feedback that has been received from larger licensees and why they have not yet started to use NMAR. CNSC staff responded that, while the feedback from the larger licensees has been positive, more time is required to update and change their own computer systems in order to be compatible with NMAR. Smaller licensees have fewer reports to submit, and in general, this change has been simpler for them. CNSC staff added that all licensees are expected to use NMAR by 2016.

181. The Commission requested more information on cyber security with respect to NMAR. CNSC staff responded that measures through Shared Services Canada have been implemented to protect the network against cyber-attacks. CNSC staff further explained that GCKey authentication services, the Government of Canada standard for authentication services, are being used to identify authorized NMAR users. CNSC staff also provided information on additional features of NMAR which will ensure the integrity of the CNSC system.

182. The Commission enquired about how NMAR will improve nuclear materials reports data processing efficiency. CNSC staff responded that, since the reports will not be entered manually, the use of NMAR will allow for more accurate and in-depth data analysis.

183. The Commission asked for confirmation that Canada is the first country to introduce an online materials reporting system. CNSC staff confirmed that Canada is the first country to do this and reported that the CNSC is also working with the IAEA to create an online reporting portal between the two organizations.

184. The Commission enquired on whether any software development challenges with NMAR were encountered. CNSC staff responded that the challenges encountered were minimal and that the project is considered a success from a software development standpoint. CNSC staff provided more information on how NMAR was developed and how software development challenges were minimized.

185. The Commission requested further information on how NMAR will help the CNSC reconcile bilateral partner information. CNSC staff responded that NMAS is currently being used to compile bilateral partner information and that NMAR could be used for this in the future.

DECISION ITEMS

Regulatory Document REGDOC-2.3.2, *Accident Management*

186. With reference to CMDs 14-M52 and 14-M52.A CNSC staff presented to the Commission its recommendation to issue regulatory document REGDOC-2.3.2, *Accident Management,* for publication and use.

187. CNSC staff explained that REGDOC-2.3.2 would require that licensees have in place an integrated accident management program to manage accident conditions covering all events from relatively benign accidents up to severe accidents. CNSC staff noted that the proposed regulatory document would assist licensees in developing, implementing and validating an integrated accident management program. CNSC staff indicated that the proposed regulatory document would strengthen and modernize the CNSC accident management regulatory requirements, align CNSC practice with international post-Fukushima trends, promote an integrated approach to treating accidents, and be applied on a case-by-case risk informed basis. CNSC staff outlined the CNSC's consultation process for the proposed regulatory document.

188. CNSC staff noted that the proposed regulatory document would apply to all nuclear power plants, and in a graded manner to the National Research Universal (NRU) reactor operated by Atomic Energy of Canada Limited at the Chalk River Laboratories and any future Class IA nuclear facilities.

189. The Chair invited comments from industry representatives on proposed regulatory document REGDOC-2.3.2.

190. The representative from Bruce Power agreed on the integrated approach and the need for such a document adding, however, that it would be beneficial to merge this proposed regulatory document with proposed REGDOC-2.10.1, *Nuclear Emergency Preparedness and Response*.

191. The Bruce Power representative stated that a major issue for Bruce Power is the proposed requirement in section 3.5, bullet 4, of the document, to have an onsite emergency support centre, because the existing Bruce centre is near the facility but off site.

The representative noted that moving the centre would be costly with no real safety benefit and that licensees should maintain the authority to decide what are the best locations for an emergency support centre.

192. The Bruce Power representative also expressed potential difficulty complying with some requirements in the proposed document, such as section 3.3, bullet 2(b), relating to compliance with equipment and instrumentation requirements. The representative indicated that the preference of Bruce Power would be to have a trial period for the proposed regulatory document in order to better determine approaches to implementation. He also suggested that a workshop on the proposed regulatory document be held in order to assess progress and to determine alternative approaches to reaching the objectives of the document.

193. The representative for NB Power outlined concerns regarding the administrative burden the proposed regulatory document would impose noting that there would be little or no added safety benefit. He noted that the principles contained within the proposed document are sound but that the implementation, especially for a single unit reactor facility, would be financially onerous.

194. The representative for OPG expressed support for the objective of the document to ensure licensees have a good accident management program in place but indicated that flexibility in meeting requirements is needed. The representative provided the example of the location of the emergency response centre, on site versus off site, noting that the licensee must maintain the capability of establishing such a centre in the right location. The OPG representative supported the concept of holding a workshop on the proposed regulatory document in the future to review progress and possible improvements to the document.

195. CNSC staff stated that the main problem, as expressed by the licensees, appears to be with respect to implementation and compliance verification and not with the document itself or its stated intent. CNSC staff indicated its support for a future workshop as suggested by licensees.

196. The Commission sought clarification on the flexibility permitted in the document to enable licensees' compliance. CNSC staff indicated that site-specific compliance verification would take place and that there is flexibility in meeting requirements spelled out in the document. With respect to the location of an emergency support centre, CNSC staff indicated that they would certainly consider an offsite location if the licensee could demonstrate that the intent of the requirement had been met.

CNSC staff added that the text in brackets in section 3.5, item 4, "(consisting of a technical support centre and an onsite emergency support centre)" could be deleted from the proposed regulatory document.

197. The Bruce Power representative indicated that the Fukushima accident portrayed the need for an offsite emergency support centre, and reiterated the request of Bruce Power that the proposed document should not specify the location of such a centre. The Bruce Power representative also noted that the proposed regulatory document under discussion and proposed REGDOC-2.10.1 contain similar requirements and therefore an overall review of the documents and their implementation in approximately 18 months would be beneficial.

198. The Commission commented that the issues of communications and site security did not appear prominently in the proposed regulatory document. CNSC staff responded that these topics are covered in more detail in the proposed REGDOC-2.10.1. CNSC staff noted that REGDOC-2.3.2 is focussed more on plant operators and facility staff who must take immediate actions in the event of an accident.

199. The Commission asked for clarification on the applicability of the proposed regulatory document to SLOWPOKE reactors. CNSC staff responded that the proposed document would not apply to SLOWPOKE reactors and added that the document would be amended to clarify the type of facilities covered by the document.

200. CNSC staff remarked that REGDOC-2.3.2 is ready for publication and that CNSC staff would work with industry to establish the guidance principles and the implementation process in every LCH. CNSC staff added that the regulatory document itself would be amended prior to publication to take into consideration the concerns of the Commission regarding requirements and process.

201. The Commission stated that there is always an opportunity to update regulatory documents and that this may be required to ensure that documents are clear for all parties.

202. CNSC staff committed to work with industry to establish the guidance principles and implementation to the LCH to make the requirements clear and to further revise the document later.

Decision

203. After considering the recommendation submitted by CNSC staff and comments provided by industry representatives, the Commission approves REGDOC-2.3.2, *Accident Management*, for publication and use, subject to further staff review of the document and consideration of suggested amendments, including those relating to the location of an onsite emergency response centre and applicability of the document. In addition to annual reviews of the document, the Commission also directs CNSC staff to hold a workshop with industry representatives prior to December 2015 to clarify the interpretation of the requirements set out in REGDOC-2.3.2. The Commission is of the view that there is no need to integrate REGDOC-2.3.2 and REGDOC-2.10.1 at this time, but directs CNSC staff to review both documents to ensure consistency of language. **DECISION**

Regulatory Document REGDOC-2.10.1, *Nuclear Emergency Preparedness and Response*

204. With reference to CMD 14-M53 and CMD 14-M53.A, CNSC staff presented to the Commission its recommendation to issue Regulatory Document REGDOC-2.10.1, *Nuclear Emergency Preparedness and Response*, for publication and use.

205. CNSC staff summarized that the proposed regulatory document would replace document G-225, *Emergency Planning at Class I Nuclear Facilities and Uranium Mines and Mills*, published in 2001, and RD-353, *Testing the Implementation of Emergency Measures*, published in 2008. CNSC staff provided information on the applicability of the document, its content and on the public consultation activities related to the document. CNSC staff also described the information in the document related to the distribution of potassium iodide (KI) tablets, which is planned by December 31, 2015 if the proposed regulatory document is approved.

206. The Commission expressed concern that there were comments about possible jurisdictional issues that could affect the distribution of KI tablets and indicated that licensees need to be involved in the distribution.

207. The Bruce Power representative indicated that distribution would be relatively straight forward in the vicinity of the Bruce facility.

208. CNSC staff informed the Commission that pre-distribution of KI tablets has already successfully taken place in the vicinity of the Point Lepreau and Gentilly-2 nuclear generating stations.

209. The OPG representative expressed support for the effort to pre-distribute KI tablets. The OPG representative noted that OPG is collaborating with other stakeholders such as the Province of Ontario, Durham Region and the City of Toronto and that OPG is focussed on meeting the December 31, 2015 requirement.

210. The Commission expressed its strongly held view that jurisdictional issues should not be allowed to cause a delay in the pre-distribution of KI tablets. The Commission indicated its preference that the Ministry of Health and Long-Term Care and the Office of the Fire Marshal and Emergency Management take the lead on KI distribution and that, through the proposed regulatory document, licensees would have the obligation to ensure that pre-distribution occurs.

211. The Secretary informed the Commission of the receipt of a letters dated August 20, 2014, from the Ontario Ministry of Health and Long-Term Care and Greenpeace Canada on the subject of KI distribution, and provided some details on the content.

212. The representative from the Office of the Fire Marshal and Emergency Management commented on the jurisdictional issues regarding distribution of KI tablets and made a commitment to ensure that a pre-distribution plan would be in place by December 2015. The representative outlined the drawbacks of sending KI tablets to area residents through the mail and reiterated the need for a collaborative approach to ensure appropriate distribution. The representative noted that a requirement placed on licensees to work with local authorities on the issue would be preferable to imposing a requirement on licensees to undertake distribution on their own.

213. The Commission stated that it expects distribution of KI tablets by December 31, 2015 notwithstanding jurisdictional issues noted by the Ministry of Health and Long-Term Care, and that CNSC staff is prepared to work with the Office of the Fire Marshall and Emergency Management to complete the task.

214. The Commission enquired about the zone to be used for distribution of the KI tablets and indicated that some residents may be concerned if they reside just outside the defined zone. CNSC staff informed the Commission that the zone size varies depending on the facility and that the existing emergency planning zone is well known and is recommended. CNSC staff added that nothing precludes distribution beyond the primary zone or of residents obtaining the tablets from an area pharmacy.

215. The Commission asked about the applicability of the proposed regulatory document to various types of facilities. CNSC staff informed the Commission that the proposed document applies to all licensees that might require emergency preparedness programs and that the level of detail of this program would depend on the risk.

216. The Commission commented that the topics of communication and security could be strengthened in the document and there should be mention of how the document will become an obligation on licensees. The Commission noted that a communication plan is needed as part of the plan to pre-distribute KI tablets. Additionally, the Commission noted that the document should clearly differentiate between guidance and requirements.

217. CNSC staff informed the Commission that a comprehensive plan to distribute KI tablets would include communications, distribution method and a program review. CNSC staff stated that it would provide the Commission with regular progress updates on the implementation of the proposed regulatory document and, in particular, the pre-distribution of KI tablets. CNSC staff confirmed that the objective is to have the KI tablets distributed by the end of December 2015.

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218. The Bruce Power representative stated that a major issue for Bruce Power is the proposed requirement, in section 2.2.6, point 4, of the document to have an onsite emergency response facility because the existing Bruce centre is near the facility but off site. The representative noted that moving the facility would be costly with no real added safety benefit and that licensees should maintain the right to decide the best location for an emergency support centre. CNSC staff stated that the position of Bruce Power could be accepted if Bruce Power can show that the current location of the emergency response facility meets the intent of REGDOC-2.10.1. This same issue was previously raised by Bruce Power in discussions (above) relating to REGDOC-2.3.2.

219. The NB Power representative indicated that, with the approval of REGDOC-2.10.1, there would be two documents providing requirements for nuclear emergency preparedness and response: CSA standard N1600, *General Requirements for Nuclear Emergency Programs,* and the proposed REGDOC-2.10.1. CNSC staff informed the Commission that the two documents noted by the NB Power representative are complementary, not contradictory, and are not duplicative.

220. After considering the recommendations submitted by CNSC staff, and comments provided by industry, Ontario Ministry of Health and Long-Term Care, the Ontario Office of the Fire Marshal and Emergency Management, and Greenpeace, the Commission approves Regulatory Document REGDOC-2.10.1, *Nuclear Emergency Preparedness and Response*, for publication and use. The Commission is of the view that there is no need to integrate REGDOC-2.3.2 and REGDOC-2.10.1 at this time, but directs that CNSC staff review both documents to ensure consistency of language. The Commission further directs CNSC staff to include in the compliance verification criteria for licence requirements on emergency programs in the LCHs for reactor facilities above 10MWth, that licensees develop a KI tablet distribution and communications plan and that licensees ensure distribution of KI tablets in the primary zones by December 31, 2015, if distribution has not been previously undertaken by another agency. **DECISION**

221. The Commission informed CNSC staff of its decision prior to the approval of the minutes at the October 1 – 2, 2014, Commission meeting so that REGDOC 2.10.1 (and REGDOC 2.3.2) can be published in September 2014, if ready.

Closure of the Public Meeting

222. The meeting closed at 4:48 pm.

Sophie Gregoire Gwo B.
Recording Secretary Gwestern

OCT 0 3 2014
Date

Sophie Gregoire Gwo S.
Recording Secretary Dimitrijevic

OCT 0 3 2014
Date

Recording Secretary

OCT 0 3 2014
Date

Secretary

3/10/2014
Date

APPENDIX A

CMD DATE File No

14-M37 2014-07-22 Edocs #4475386
Notice of Meeting of August 20 and 21, 2014

14-M38 2014-08-07 Edocs #4483396
Agenda of the meeting of the Canadian Nuclear Safety Commission to be held on Wednesday and Thursday, August 20 and 21, 2014, in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario

14-M38.A 2014-08-14 Edocs #4485371
Revised agenda of the meeting of the Canadian Nuclear Safety Commission to be held on Wednesday and Thursday, August 20 and 21, 2014, in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario

14-M39 2014-08-05 Edocs #4482498
Approval of Minutes of Commission Meeting held June 19, 2014

14-M40 2014-08-18 Edocs #4488458
Status Report on Operating Reactors units as of August 18, 2014

14-M41 2014-07-21 Edocs #4471118
Update on Regulatory Document RD-336, Accounting and Reporting of Nuclear Material

14-M41.A 2014-08-12 Edocs #4484988
Update on Regulatory Document RD-336, Accounting and Reporting of Nuclear Material – Oral presentation by CNSC staff

14-M42 2014-08-14 Edocs #4482451
Ontario Power Generation: Pickering Nuclear Generating Station – Follow up to Commission Requests from the Pickering Hold Point Hearing

14-M42.A 2014-08-14 Edocs #4487144
Ontario Power Generation: Pickering Nuclear Generating Station – Follow up to Commission Requests from the Pickering Hold Point Hearing – Oral presentation by CNSC staff

14-M42.1 2014-08-06 Edocs #4482740
Ontario Power Generation: Pickering Nuclear Generating Station – Follow up to Commission Requests from the Pickering Hold Point Hearing

14-M42.1A 2014-08-13 Edocs #4487260
Ontario Power Generation: Pickering Nuclear Generating Station – Follow up to Commission Requests from the Pickering Hold Point Hearing – Oral presentation by Ontario Power Generation

14-M43 2014-08-05 Edocs #4476613
Adoption of CSA PCP-09 for the Certification of Exposure Device Operators

14-M43.A 2014-08-12 Edocs #4487746
Adoption of CSA PCP-09 for the Certification of Exposure Device Operators – Oral presentation by CNSC staff

14-M44 2014-07-30 Edocs #4476086
Financial guarantee program for nuclear substance, prescribed equipment and Class II nuclear facility licences

14-M44.A 2014-08-12 Edocs #4488468
Financial guarantee program for nuclear substance, prescribed equipment and Class II nuclear facility licences – Oral presentation by CNSC staff

14-M45 2014-06-05 Edocs #4230994
Presentation on the CNSC Staff Intergrated Safety Assessment of Canadian Nuclear Power Plants for 2013 (2013 NPP Report) and on Nuclear Safety Enhancements

14-M45.A 2014-08-12 Edocs #4232286
Presentation on the CNSC Staff Intergrated Safety Assessment of Canadian Nuclear Power Plants for 2013 (2013 NPP Report) and on Nuclear Safety Enhancements – Oral presentation by CNSC staff

14-M54 2014-08-13 Edocs #4487267
Presentation on the CNSC Staff Intergrated Safety Assessment of Canadian Nuclear Power Plants for 2013 (2013 NPP Report) and on Nuclear Safety Enhancements – Oral presentation by Ontario Power Generation, NB Power and Bruce Power on Nuclear Safety Enhancements

14-M45.1 2014-07-15 Edocs #4474169
Presentation on the CNSC Staff Intergrated Safety Assessment of Canadian Nuclear Power Plants for 2013 (2013 NPP Report) and on Nuclear Safety Enhancements – Written submission from the Ontario Ministry of Labour

14-M45.2 2014-07-16 Edocs #4474196
Presentation on the CNSC Staff Intergrated Safety Assessment of Canadian Nuclear Power Plants for 2013 (2013 NPP Report) and on Nuclear Safety Enhancements – Written submission from Power Workers' Union

14-M45.3 2014-07-17 Edocs #4474163
Presentation on the CNSC Staff Intergrated Safety Assessment of Canadian Nuclear Power Plants for 2013 (2013 NPP Report) and on Nuclear Safety Enhancements – Written submission from Sunil Nijhawan

14-M45.4 2014-07-17 Edocs #4474385
Presentation on the CNSC Staff Intergrated Safety Assessment of Canadian Nuclear Power Plants for 2013 (2013 NPP Report) and on Nuclear Safety Enhancements – Written submission from New Clear Free Solutions

14-M45.5 2014-07-17 Edocs #4474388
Presentation on the CNSC Staff Intergrated Safety Assessment of Canadian Nuclear Power Plants for 2013 (2013 NPP Report) and on Nuclear Safety Enhancements – Written submission from Michel Duguay

14-M46 2014-08-05 Edocs #4482539
Update on the Cliffs Quebec Iron Mining Limited incident involving potential overexposure to workers – Oral presentation by CNSC staff

14-M47 2014-08-05 Edocs#4482601
Update on the Sunnybrook Health Sciences Centre Incident involving the loss of low-risk sealed radioactive sources – Oral presentation by CNSC staff

14-M48 2014-08-05 Edocs#4482695
Update on the Alberta Health Services incident involving the unauthorized handling of sealed sources at their facility – Oral presentation by CNSC staff

14-M49 2014-08-05 Edocs#4482702
Update on the incident involving a Flexitron High Dose Rate brachytherapy Unit – Oral presentation by CNSC staff

14-M51 2014-08-12 Edocs#4487283
Cradle to Grave Fuel Management Story in Canada – Oral presentation by CNSC staff

14-M52 2014-08-01 Edocs#4479863
Regulatory Document REGDOC-2.3.2, Accident Management

14-M52.A 2014-08-12 Edocs#4486354
Regulatory Document REGDOC-2.3.2, Accident Management – Oral presentation by CNSC staff

14-M53 2014-08-01 Edocs#4479908
Regulatory Document REGDOC-2.10.1, Nuclear Emergency Preparedness and Response

14-M53.A 2014-08-12 Edocs#4486415
Regulatory Document REGDOC-2.10.1, Nuclear Emergency Preparedness and Response – Oral presentation by CNSC staff

14-M53.1 2014-08-20 Edocs#4491843
Regulatory Document REGDOC-2.10.1, Nuclear Emergency Preparedness and Response – Written submission from the Ontario Ministry of Health and Long-Term Care

14-M53.2 2014-08-20 Edocs#4491856
Regulatory Document REGDOC-2.10.1, Nuclear Emergency Preparedness and Response – Written submission from Greenpeace Canada

14-M55 2014-08-05 Edocs#4483268
Update on the incident involving four uranium hexafluoride cylinders at the Port of Halifax – Oral presentation by CNSC staff

14-M56 2014-08-12 Edocs#4486500
Event Initial Report – Ontario Power Generation: Generator Seal Oil Release to the Environment at Unit 3 of Darlington Nuclear Generating Station – Oral presentation by CNSC staff