April 29, 2009

Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held Wednesday, April 29, 2009 beginning at 9:07 a.m. in the Public Hearing Room, CNSC Offices, 280 Slater Street, Ottawa, Ontario.

Present:

M. Binder, President
C.R. Barnes
A. Harvey
R.J. Barriault
D.D. Tolgyesi
M. J. McDill

M. Leblanc, Secretary
L. Thiele, Senior Counsel
S. Gingras, Recording Secretary

CNSC staff advisors were: G. Rzentkowski, P. Thompson, C. Purvis, R. Lane, P. Elder, P. Jones, D. Howard, R. Awad, M. Mckee, F. Ashley, K. Scissons, G. Frappier, Y. Akl, C. Harwood, B. Ecroyd, P. Hessel and M. Dallaire

Other contributors were:

- Municipality of Port Hope: Mayor L. Thompson
- Families Against Radiation Exposure (FARE): L. Barraclough
- Port Hope Community Health Concerns Committee (PHCHCC): F. More
- Ontario Power Generation Inc. (OPG): J. Hudson, K. Mombourquette and P. Witzke
- Cameco Corporation: T. Gitzel, L. Yesnik, D. Neuburger, K. Himbeault and B. Moldovan

Adoption of the Agenda

1. The revised agenda, CMD 09-M11.B, was adopted as presented.

Chair and Secretary

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

Constitution

3. With the notice of meeting, CMD 09-M10, having been properly given and a quorum of Commission Members being present, the meeting was declared to be properly constituted.

4. Since the meeting of the Commission held February 19, 2009, Commission Member Documents CMD 09-M10 to CMD 09-M19 were distributed to Members. These documents are further detailed in Annex A of these minutes.

Minutes of the CNSC Meeting Held February 19, 2009

5. The Commission Members approved the minutes of the February 19, 2009 Commission Meeting as presented in CMD 09-M12 with the following changes:

6. On item 43, the fourth sentence is replaced with:

   "It was estimated that about 17 kg of heavy water (out of the contained 68 000 kg) had leaked from the reactor core."

7. Regarding item 19, the Commission asked whether CNSC staff received a response to the letter sent to Bruce Power on the findings of a recent inspection. CNSC staff responded that it was not aware whether Bruce Power sent the letter, but that it would follow-up on this issue.

8. The Commission requests CNSC staff to provide an update on this topic at the next Commission Meeting. **ACTION**

STATUS REPORTS

Significant Development Report (SDR)

9. There were no Significant Development Reports presented at this Commission Meeting.

Status Report on Power Reactors

10. With reference to CMD 09-M13, which includes the Status Report on Power Reactors, CNSC staff made the following updates to the Report:

11. CNSC staff reported that Bruce B, Unit 6 is in a forced outage. The unit was safely taken offline at 5:55 p.m. on April 28, 2009 due to a leak in the transport system. CNSC staff further noted that Bruce Power initiated the unit forced outage plan and enlisted additional assistance to support the Outage Control Centre.

12. CNSC staff made the following correction to the Report: the Pickering B, Unit 5 re-synchronization to the grid is planned for April 29th and not April 21st as indicated in the Report.

13. The Commission asked for an update on the refurbishment activities at Point Lepreau. CNSC staff responded that 95 percent of pressure tube removal has been completed, and that the project is three to four month behind schedule. CNSC staff further explained that if the Commission approves the fuel reload (for which the hearing is planned for August 2009), there are six- to seven-month commissioning activities to be performed before restarting. Therefore, a restart of the reactor is not expected before the spring of 2010.

14. The Commission asked when the refurbishment activities at Gentilly-2 would begin. CNSC staff responded that there is no specific date set since the integrated safety review is not yet completed. CNSC staff mentioned the existence of a project plan for the refurbishment, and that it is working with Hydro-Québec to ensure that the planned activities are properly mapped against the process identified in Regulatory Document RD-360, *Life Extension of Nuclear Power Plants*.

15. The Commission commented that the use of technical terms in the Status Report, without providing details or explanation, might raise concerns for the public. The Commission also suggested that more precise information be added in the Status Report including, for example, information on estimated dates of planned activities when available. CNSC staff acknowledged the issue and committed to provide more details in future reports.

ACTION
To be closed upon confirmation by the Commission during the June 11, 2009 meeting

INFORMATION ITEM

Presentation of the Synthesis Report: Understanding Health Studies and Risk Assessments Conducted in the Port Hope Community from the 1950s to the Present

16. With reference to CMD 09-M14, CNSC staff presented a summary of a synthesis report on health studies and risk assessments performed in the Port Hope community since the 1950s. The report was the result of a request made by the Commission in 2006. CNSC staff concluded from this assessment that no adverse health effects have been shown to have occurred or are likely to occur in Port Hope as a result of the operations of the nuclear industry in that community.

17. With reference to CMD 09-M14.1, the Mayor of the Municipality of Port Hope expressed her satisfaction with the conclusion of the report. She also described an issue regarding a soil sample that exceeded standards and guidelines, and where the Municipality has been reassured that the levels were of no immediate concern. The

Mayor also noted that the Low Level Radioactive Waste Management Office recently conducted gamma radiation surveys and concluded that the radiation levels were either in the background range or above background, but well below threshold values where action would be needed.

18. With reference to CMD 09-M14.2, Families Against Radiation Exposure (FARE) expressed its view that the synthesis report contains several studies that show increased health risks in Port Hope, and that the concentrations of radioactive substances in the air are unsafe. FARE therefore disagrees with the conclusions of the report. It also stated that several studies cited in the synthesis report, as well as an earlier draft of this report, had not been properly peer reviewed.

19. With reference to CMD 09-M14.3, the Port Hope Community Health Concern Committee (PHCHCC) indicated its belief that the report is flawed, based on improper assumptions, that it ignores important data and that it should not be considered a final document. PHCHCC is also of the view that more health studies should be done on people who lived on contaminated properties, especially with the cleanup of radioactive waste planned to be done by the Low Level Radioactive Waste Management Office.

20. The Commission asked for CNSC staff's views on the conclusions of the report. CNSC staff responded that it was previously involved in a number of assessments in Port Hope and was not surprised with the conclusions since the contaminants found in this community are well known and were well studied.

21. The Commission further asked CNSC staff whether there was enough scientific information gathered to properly address potential cumulative effects on the population. CNSC staff answered that it did address the issue of cumulative effects through the examination of epidemiological studies. CNSC staff added that it did not consider synergistic effects closely since the impact of the contaminants present in Port Hope are not with the same organs or the same end point, thus concluding that adding the levels of exposure and assessing a cumulative health effect was not appropriate.

22. The Commission enquired on the issue raised by the PHCHCC on the effects of receiving low doses over long periods of time. CNSC staff responded that low doses of radiation are referred in the scientific literature as a few hundredths of millisieverts. Natural background of radiation is around two to three millisieverts while exposures from nuclear industries, including those in Port Hope,

are a small fraction of one millisievert. Therefore, when these doses are found in environmental systems, they do not result in measurable environmental effects.

23. The Commission asked for clarification on CNSC staff's recommendation that no major health studies be conducted for another 15 years. CNSC staff responded that, during the next 15 years, it will have compiled sufficient additional information to determine if there are differences with the current findings and sufficient follow-up data to re-assess the Eldorado study.

24. The Commission asked CNSC staff to comment on the health monitoring activities suggested by the PHCHCC. CNSC staff explained that it does not recommend biological testing or health surveillance for members of the public since there is no evidence, from this report and from other studies around the world, of detrimental health effects to the population coming from exposure to radiation and uranium from past or current operations. However, CNSC staff indicated that it would come back to the Commission with new recommendations if the ongoing monitoring of the local nuclear facilities, through the required radiation protection and environmental monitoring programs, were to indicate the need to carry out more work on the population.

25. The Commission asked for CNSC staff's comments on FARE's statement regarding improper peer reviews. CNSC staff explained that it considers the study to have been correctly peer reviewed by external experts that have verified the technical work done by CNSC staff. CNSC staff also stated that, contrary to FARE's statement, the studies used by CNSC staff to compile the report had also been scientifically peer reviewed.

26. The PHCHCC commented that the conclusions made by Dr. Eric Mintz, who was hired by the CNSC as a consultant in 2000, were not taken into account. In response to comments requested by the Commission, CNSC staff explained that it did not agree with Dr. Mintz's conclusions since, in its view, he made basic misinterpretations of statistical concepts and epidemiological methods.

27. The Commission asked for comments from CNSC staff on FARE's concerns regarding some conclusions of the report, including the conclusion that there are statistically significant elevated mortality rates for heart disease and cirrhosis of the liver. CNSC staff explained that it looked at the scientific literature regarding the contaminants in Port Hope and determined plausible health effects. CNSC staff also reviewed epidemiological studies and compared

them with other studies done in other communities and populations. CNSC staff added that cardiovascular disease rates are higher in the whole Northumberland County and not only in Port Hope.

28. The Commission commented that statements of "increased frequency of diseases" could cause concern in the community, and asked if there would be a possibility to provide clarification. CNSC staff suggested that a frequently asked question document could be written to address such issues. **ACTION**

29. In response to a question from the Commission on female workers and female offspring, CNSC staff explained that there was no evidence of negative effects in offspring of nuclear workers, however most nuclear energy workers are male. CNSC staff added that it found no evidence of statistically higher incidence of birth defects, infant mortality and childhood cancers in the area.

30. The Commission asked CNSC staff for more information on how it took into consideration the variations in the level of exposure over time. CNSC staff responded that more robust studies, like the Eldorado study, allow the detection of health effects for periods of higher exposure because they include a follow-up over a long period of time.

31. In response to a question from the Commission on how the studies done in Port Hope compare to similar ones done in other countries, CNSC staff explained that the studies done in other countries led to the same conclusions as studies performed in the Port Hope area.

32. The Commission asked for clarification on the PHCHCC's statement that there is no safe level of radiation. The PHCHCC responded that it understands there are efforts to minimize radiation exposure because of the difficulty of calculating the exact level of risk. PHCHCC expressed the view that exposures should be minimal or zero. CNSC staff explained that the *Radiation Protection Regulations* specify dose limits for members of the public and for workers that are safe, on the basis of the international work that has been done on understanding health effects of radiation. Also, these regulations require that licensees operate under the principle of ALARA (As Low As is Reasonably Achievable) which requires that programs be put in place to reduce emissions as low as possible and to reduce doses to workers as low as possible. CNSC staff noted that the nuclear facilities regulated by the CNSC, and thus operating under the ALARA principle, result in exposures to members of the public that are very much below the public dose limit.

33. The Commission enquired on the possibility to make changes to the report. CNSC staff answered that, while it considers the report to be final, it would address any issues raised and revise the report accordingly if necessary.

34. While the Commission acknowledges that the report is considered final by CNSC staff, the Commission notes that the document may be subject to changes according to Commission or public comments or upon receipt of new data. In this regard, the Commission notes that the document entitled "Synthesis Report" should be used as a reference document.

35. At this time, the Commission is satisfied with the report and with CNSC staff's conclusions, as presented in CMD 09-M14.

36. The Commission also agrees with CNSC staff that the licensees' radiation protection and environmental monitoring programs provide an adequate means to determine whether additional monitoring of the health effects on the population should be carried out. In this respect, the Commission does not agree with CNSC staff's recommendation that no further health studies should be done in the Port Hope area. Instead, the Commission requests that further health studies be conducted in the event new data determine they are warranted. **DECISION**

STATUS REPORTS

Ontario Power Generation Inc.: Status Report on the Decommissioning of Ontario Power Generation's Bruce Heavy Water Plant

37. With reference to CMD 09-M15.1, Ontario Power Generation (OPG) summarized the decommissioning activities that took place at the Bruce Heavy Water Plant (BHWP) since its last update in June 2006.

38. With reference to CMD 09-M15, CNSC staff summarized OPG's activities since 2006 and noted that it had no concerns regarding radiation protection, environmental protection, worker health and safety and emergency preparedness and response.

39. The Commission asked about the recycling of steel. CNSC staff answered that, as part of any decommissioning project, material is recycled and reused as much as possible.

40. The Commission enquired about future use of the site. OPG responded that the land will continue to be owned by OPG, but that there are no identified future uses for the facility. Only some services, like the fire water pumphouse, will remain since they are currently being used for other purposes.

41. The Commission asked what type of petroleum hydrocarbons had contaminated the soil. OPG answered that soils are contaminated with light hydrocarbons from the operation of the plant which made extensive use of light hydrocarbon oils in seals and for lubrication. OPG added that the oil storage area contained oil tanks used for storing blower seal oils.

42. The Commission enquired on the extent of contamination in the bedrock. CNSC staff answered that the minor contamination found in the bedrock was scraped and removed. CNSC staff added that the 2008 groundwater monitoring showed a significant reduction in contamination.

43. In response to a question from the Commission on the removal of 600 000 litres of oily water, OPG stated that the source of the oily water was not groundwater. OPG explained that the upper surface of the bedrock was washed with a pressure-washing system and the resulting wash water was captured and sent for disposal.

44. The Commission expressed concerns about potential contamination too deep to be noticed by the current ground monitoring. CNSC staff committed to provide an answer to this issue at a later time through the Secretariat. **ACTION**

45. The Commission asked for more information on the type of environmental monitoring that has been and will be performed until the abandonment of the site. OPG answered that it is following the plans of the follow-up monitoring report in accordance with the environmental assessment that was carried out for this project. OPG added that parameters like air quality, groundwater quality, and noise were monitored during the demolition phase. OPG noted that all of the monitoring results are submitted to CNSC staff.

46. In response to a question from the Commission on whether the environmental monitoring information had been posted on OPG's Web site or sent to members of the community, OPG stated that it sent the information to CNSC staff only, but that it notified members of the impact advisory committee that the information was available on request. OPG stated that it did not receive requests for information. CNSC staff confirmed that the information is available to the public on request.

47. The Commission showed its appreciation for the pictures and maps included in CNSC staff's presentation. The Commission asked CNSC staff to present this type of information in future Commission Member Documents as well.

ACTION
To be closed upon confirmation by the Commission during the June 11, 2009 meeting

48. The Commission noted that certain information, such as results of monitoring programs, should be proactively disclosed to the public with the intent to increase transparency.

Cameco Corporation - Key Lake Operation: Progress Report on the Implementation of Molybdenum and Selenium Removal Measures

49. In the October 23, 2008 *Record of Proceedings, Including Reasons for Decision* for the renewal of the Key Lake licence, the Commission requested that Cameco Corporation (Cameco) provide a progress report at the April 2009 Commission Meeting on the implementation of molybdenum and selenium removal measures.

50. With reference to CMD 09-M16.1 and CMD 09-M16.1A, Cameco summarized the activities made in relation to the implementation of a molybdenum-selenium removal circuit at Key Lake Operation. Cameco also showed data related to the performance of the system. Cameco reported that construction is complete and that it is moving towards system optimization to determine if any further improvements in the removal of molybdenum and selenium can be achieved.

51. Cameco indicated that it would update the Commission during the November 2009 Commission Meeting on the outcome of its optimization work and progress in re-evaluating environmental risk in the David Creek system.

ACTION

52. With reference to CMD 09-M16, CNSC staff provided a brief summary of its findings and conclusions. CNSC staff is of the view that Cameco needs to continue to identify and evaluate other reasonable options for further selenium reduction in the mill effluent and downstream environment, and that Cameco should continue to report monthly to CNSC staff on the ongoing commissioning and optimization activities under the Phase I initiative.

53. The Commission asked for reasons why the average selenium concentrations stayed the same despite the full commissioning of the treatment system. Cameco responded that there is an effective control of the selenium concentrations of the effluent regardless of the feed sources into the circuit. Therefore, Cameco does not expect any sharp increases of selenium concentrations in effluent as was observed in 1998 and 1999.

54. In response to the Commission's questioning on the concentration of selenium in effluents, Cameco explained that the Canadian Water Quality Objective (CWQO) in the downstream environment is 0.001 mg per litre, while the end-of-pipe target value is 0.01 mg per litre. Cameco confirmed that the average selenium concentration in water leaving the removal system is 0.025 mg per litre, 2.5 times the target value. Cameco added that the average selenium concentration in the downstream environment averaged 0.002 mg per litre, twice the CWQO.

55. The Commission asked about the potential impact of the reduction of flow through the treatment plant on the selenium concentrations. Cameco answered that the selenium concentrations would remain similar but that there would be less loading to the environment due to the lower volume of water released.

56. The Commission asked CNSC staff about any possible actions to be taken by Cameco to further reduce selenium loadings to the environment if the planned phase 3 of the project is not feasible. CNSC staff responded that it expects Cameco to review the handling of the waste water at different areas of the process to find a way to further reduce selenium releases to the environment. In response to further questioning from the Commission, Cameco expressed its willingness to assess other alternatives, and stated that it is committed to ensuring that all releases are as low as reasonably possible.

57. In response to a question from the Commission on the possible risks of selenium to the environment, Cameco noted that research has shown possible long-term risks of selenium to fish, but not to bird reproduction. CNSC staff stated that conclusions from a workshop held in March 2009 with researchers from the University of Saskatchewan were that selenium is bio-accumulating and bio-magnifying within the system and is affecting fish reproduction but not bird reproduction.

58. The Commission requested Cameco and CNSC staff to provide during the November 2009 Commission Meeting an update on

analyses done on selenium levels in the environment, as well as work performed by Cameco and its plans to further reduce selenium in the David Creek Watershed. **ACTION**

59. The Commission asked Cameco whether data on contaminants in the environment are publicly available. Cameco answered that, while the data were not posted on its Web site, the information was sent to the province of Saskatchewan and to CNSC staff. The Commission suggested that this information be posted on Cameco's Web site for transparency purposes.

DECISION ITEMS

Regulatory Document RD-152, *Guidance on the use of Deterministic and Probabilistic Criteria in Decision-Making for Class I Nuclear Facilities*

60. With reference to CMD 09-M18, CNSC staff presented to the Commission a summary of Regulatory Document RD-152. CNSC staff briefly explained the definitions of deterministic and probabilistic safety analyses, and recommended that the Commission approve the document for public consultation.

61. The Commission asked for more information on the links between RD-152, RD-337, *Design of New Nuclear Power Plants*, RD-310, *Safety Analysis for Nuclear Power Plants*, and S-294, *Probabilistic Safety Assessment (PSA) for Nuclear Power Plants*. CNSC staff responded that RD-337 sets out the requirement to carry out deterministic and probabilistic analyses while RD-310 and S-294 set out the requirements of how to carry out a deterministic safety analysis and a probabilistic safety analysis, respectively. CNSC staff further explained that RD-152 explains how the results of probabilistic safety analysis and deterministic safety analysis can be combined, and how CNSC staff will assess the different analyses.

62. The Commission enquired whether the regulatory documents applied to new construction or to existing reactors. CNSC staff explained that RD-337 applies to reactors that will be built after the year 2008, and that RD-152 will apply to both new and existing reactors, since there is a requirement for current nuclear reactor licensees to undertake various safety assessments.

63. In response to a question from the Commission on the determination of potential accidents, CNSC staff explained that deterministic and probabilistic analyses are usually done iteratively. A preliminary probabilistic safety analysis is done when a plant is designed, and a deterministic analysis is based on identified events and systems that can fail. The probabilistic safety

analysis is then revisited. CNSC staff confirmed that its primary role is to verify that these analyses are done using appropriate criteria and methods.

64. The Commission enquired on reasons why only limits on iodine-125 and cesium-137 releases are provided in the quantitative safety goals for nuclear power plants. CNSC staff answered that these isotopes are representative of short- and long-term contamination and that, while other radionuclides would be released, the highest activities would come from iodine-125 and cesium-137.

65. In response to the Commission's request for more information on the next steps to be taken if the document is approved, CNSC staff explained that the document would be available for public consultation. The document would then be reviewed and revised as necessary, based on the comments received. Afterwards, the document would be presented to the Commission for approval for publication at a Commission public meeting, possibly in the fall of 2009. **ACTION**

66. The Commission expressed some concerns regarding the use of certain terms in the French translation. CNSC staff noted the concerns and indicated that the next version of the document should see significant improvement. **ACTION**

67. After considering the recommendations submitted by CNSC staff, the Commission approves Regulatory Document RD-152, *Guidance on the Use of Deterministic and Probabilistic Criteria in Decision-making for Class I Nuclear Facilities* to proceed to public consultation. **DECISION**

Regulatory Document S-298, *Effectiveness of Nuclear Response Force Standard*
Note: the following item was held in closed session.

68. With reference to CMD 09-M17, CNSC staff summarized its conclusions on the effectiveness of Regulatory Document S-298, and made its recommendations for further improving the application of this document.

69. The Commission accepts CNSC staff's recommended changes to the document. **DECISION**

70. CNSC staff committed to come back to the Commission with a revised version of the document, possibly during the fall of 2009. **ACTION**

Closure of the Public Meeting

71. The meeting closed at 5:47 p.m.

Zephie Onigwa (signature) 2009-06-18

Recording Secretary Date

R.D. McGee for (signature) 18.06.09

Secretary Date

APPENDIX A

CMD	DATE	File No

09-M10 2009-03-18 (6.02.01)
Notice of Meeting of April 29, 2009

09-M11 2009-04-15 (6.02.02)
Agenda of the meeting of the Canadian Nuclear Safety Commission to be held on Wednesday, April 29, 2009, in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario

09-M11.A 2009-04-23 (6.02.02)
Updated agenda of the meeting of the Canadian Nuclear Safety Commission to be held on Wednesday, April 29, 2009, in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario

09-M11.B 2009-04-27 (6.02.02)
Updated agenda of the meeting of the Canadian Nuclear Safety Commission to be held on Wednesday, April 29, 2009, in the Public Hearing Room, 14th floor, 280 Slater Street, Ottawa, Ontario

09-M12 2009-04-14 (6.02.03)
Approval of Minutes of Commission Meeting held February 19, 2009

09-M13 2009-04-15 (6.02.04)
Status Report on Power Reactors Units as of April 15, 2009

09-M14 2009-04-14 (6.02.04)
Synthesis Report: Understanding Health Studies and Risk Assessments Conducted in the Port Hope Community from the 1950s to the Present – Oral presentation by CNSC staff

09-M14.1 2009-04-24 (6.02.04)
Synthesis Report: Understanding Health Studies and Risk Assessments Conducted in the Port Hope Community from the 1950s to the Present – Oral presentation by the Municipality of Port Hope

09-M14.2 2009-04-24 (6.02.04)
Synthesis Report: Understanding Health Studies and Risk Assessments Conducted in the Port Hope Community from the 1950s to the Present – Oral presentation by Families Against Radiation Exposure (FARE), Port Hope

09-M14.3 2009-04-24 (6.02.04)
Synthesis Report: Understanding Health Studies and Risk Assessments Conducted in the Port Hope Community from the 1950s to the Present – Oral presentation by the Port Hope Community Health Concerns Committee

09-M15 2009-04-09 (6.02.04)
Status Report on the decommissioning of Ontario Power Generation's Bruce Heavy Water Plant – Oral presentation by CNSC Staff

09-M15.1 2009-04-08 (6.02.04)
Status Report on the decommissioning of Ontario Power Generation's Bruce Heavy Water Plant – Oral presentation by Ontario Power Generation Inc.

09-M15.1A 2009-04-08 (6.02.04)
Status Report on the decommissioning of Ontario Power Generation's Bruce Heavy Water Plant – Oral presentation by Ontario Power Generation Inc.

09-M16 2009-04-14 (6.01.07)
Cameco Corporation – Key Lake Operation: Progress report on the implementation of molybdenum and selenium removal measures – Oral presentation by CNSC Staff

09-M16.1 2009-04-09 (6.02.04)
Cameco Corporation – Key Lake Operation: Progress report on the implementation of molybdenum and selenium removal measures – Oral presentation by Cameco Corporation

09-M16.1.A 2009-04-22 (6.02.04)
Cameco Corporation – Key Lake Operation: Progress report on the implementation of molybdenum and selenium removal measures – Oral presentation by Cameco Corporation

09-M17 2009-06-04 (6.02.04)
Effectiveness of Nuclear Response Force Standard S-298 – Contains Cabinet Confidence documents and is not publicly available

09-M18 2009-04-09 (1.03.04)
Regulatory Document RD-152, Guidance on the Use of Deterministic and Probabilistic Criteria in Decision-making for Class I Nuclear Facilities – Oral presentation by CNSC Staff

09-M19 2009-04-14 (6.02.04)
Updates on items from previous Commission proceedings