

Canadian Nuclear  
Safety Commission



Commission canadienne  
de sûreté nucléaire

Minutes of the Canadian Nuclear Safety  
Commission (CNSC) Meeting held  
on February 4, 2015



Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held Wednesday, February 4, 2015 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  
S. Dimitrijevic, Recording Secretary

CNSC staff advisors were: R. Jammal, B. Howden, D. Desjardins, K. Lafrenière, D. Newland, J. Mecke, K. Glenn, J. Brown, J. LeClair and C. Purvis

Other contributors were:

- Cameco Corporation: L. Mooney, B. Moldovan and K. Himbeault
- Ontario Power Generation Inc.: S. Gregoris

#### Constitution

1. With the notice of meeting CMD 15-M1 having been properly given and four permanent Members of the Commission being present, the meeting was declared to be properly constituted.
2. Since the meeting of the Commission held December 17-18, 2014, Commission Member Documents CMD 15-M1 to CMD 15-M5 were distributed to Members. These documents are further detailed in Annex A of these minutes.

#### Adoption of the Agenda

3. The revised agenda, CMD 15-M2, was adopted as presented.

#### Chair and Secretary

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

#### Minutes of the CNSC Meeting Held December 17-18, 2014

5. The Commission Members approved the minutes of the November 5, 2014 Commission Meeting as presented in CMD 15-M5.

## STATUS REPORTS

### Status Report on Power Reactors

6. With reference to CMD 15-M3, which includes the Status Report on Power Reactors, CNSC staff presented updates on the following items:
  - On January 30, 2015, at Darlington NGS, a worker was injured while working on the piping for the auxiliary heating system. OPG promptly notified CNSC staff and the Ontario Ministry of Labour (MOL) and submitted a preliminary report to CNSC staff on February 2, 2015. CNSC staff added that OPG was conducting a root cause investigation and would submit a detailed event report to CNSC staff; and
  - Point Lepreau NGS: CNSC staff informed the Commission that New Brunswick Power had implemented appropriate measures to deal with severe winter weather and that the station had continued its safe operation throughout the series of severe winter storms.
7. The Commission enquired about the operational limits lower than the original nominal design output for Bruce NGS and asked when these limits were established. CNSC staff responded that the Bruce A NGS was designed to provide steam to the main steam plant and that the output of the Bruce A reactors is essentially designed for 10% steam output and 90% electrical output. CNSC staff explained specific reasons for the power limits at the units of Bruce A and Bruce B NGS, and noted that the Bruce units were at 100% of nominal design output in the mid-1990s.
8. CNSC staff also explained that, in general, limitations of the output power are introduced with ageing of reactor components and described reasons for reducing the thermal power output of nuclear reactors. CNSC staff underlined that these limits are of operational nature, do not compromise the safe operation of a reactor, and are introduced as compensatory measures to maintain the design limits in the safety analysis.
9. The Commission sought more details on the injury at the Darlington NGS. An OPG representative provided a detailed description of the incident, described the injury and noted that the worker had returned to work on light duties. The OPG representative added that the MOL was conducting an investigation into this incident.
10. The Commission asked if the injured worker was an OPG employee or a contractor. The OPG representative responded that the worker was a contractor. The Commission asked about the

- nature of the Darlington supervision over the contractor's activities at the site. The OPG representative explained that the work had been done within an owner/constructor project through OPG's Projects and Modifications Group that provides oversight to the work. The OPG representative added that the contractor is expected to provide oversight to the work, as well.
11. The Commission enquired about the leak from the demineralized water tank that had led OPG to manually shut down Unit 4 of the Darlington NGS. The OPG representative explained that the demineralized water system supplies cooling to the main circulating pumps and key components that are required for full power operation. The OPG representative provided details about the leak and explained that the unit was shut down as a preventive measure. The leaking component was on the preventative maintenance program and OPG was conducting a formal analysis in their corrective action program, since the last inspection showed no indications of any defects.
  12. The Commission asked if the root cause analysis of this leak would include an assessment whether the involved materials and components were qualified. The OPG representative responded that the material had been qualified, which would be verified as part of the assessment, and that they intend to examine their preventative maintenance program, previous installation records and logs to gather all pertinent information to understand the failure. Given the low risk nature of the event there is no need to report back to the Commission at a Commission public proceeding.

#### Event Initial Report (EIR)

#### Cameco Corporation (Cameco): Key Lake Mill Event

13. CNSC staff gave a verbal report to the Commission about an event that had occurred on January 14, 2015 at Cameco's Key Lake Mill. During the event an amount of calcined yellowcake escaped through a hole developed in the calciner shaft and entered and contaminated the working area. There were no exceedances of regulatory limits; however, of 13 workers who were exposed, five workers received doses above the action level of 1mSv (milliSievert). The highest dose to a worker was estimated at 1.8mSv. Regulatory limit is 50mSv/y. CNSC staff further informed the Commission that the workers had been safely removed from the area and enhanced bioassay sampling had been conducted. The mill was safely shut down, the hole was repaired and the working area decontaminated and cleaned. The mill safely resumed operation on January 22, 2015.

14. CNSC staff added that they had conducted an inspection on January 19-22, 2015 and were satisfied with the immediate response and actions taken by Cameco. CNSC staff had reviewed the initial reports, requested a start-up plan and an enhanced monitoring plan for the site.
15. The Commission asked about CNSC staff's further steps and the root cause analysis. CNSC staff responded that they will continue with reviews of Cameco's reports and the root cause analysis. The Commission requests that final results of the CNSC staff's review of the event be included in the Uranium Mines and Mills Annual Performance Report to be presented in the fall of 2015.
16. The Commission sought more details about the event and potential causes for appearance of the hole in the calciner shaft. Representatives from Cameco provided a detailed description of the event and explained actions taken by operators, the mill foreman and the company's radiation team. Cameco representatives added that the size of the hole was 10cm by 3cm, and that the failure and erosion on the shaft had been caused by calcined material.
17. The Commission enquired about the inspection of components and monitoring during the operation of the calciner. The Cameco representative responded that this component was regularly inspected once a year and the last visual inspection had been conducted in May 2014; however, that area was hard to inspect because it is enclosed and is outside of the normal process area. The monitoring of the thinning of the material was also conducted indirectly by monitoring the appearance of calcined material in the drying agent area, which is conducted every six hours, and this monitoring had shown the first indication of the contamination. The Cameco representative further added that all investigated signs indicate that the hole had developed quickly and that the workers had been exposed to contamination for about three hours.
18. The Commission asked if Cameco had experienced similar events in the past, and how many times had the action levels been exceeded. The Cameco representative responded that the calciner had been in operation since 1983 and this was the first event of this kind and of this magnitude. The Cameco representative added that, in the past year, no action levels had been exceeded in Cameco's operations in northern Saskatchewan.
19. The Commission asked what had been done to address potential concerns of the workers who had received doses above the action levels. Cameco representatives responded that these workers were under the enhanced bioassay program, and informed the Commission about the meetings with all the workers involved in

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- this incident, including both Cameco workers and contract workers, as well as the meetings with Cameco's Occupational Health Committee members and discussions with stakeholders at the Key Lake operation. Cameco management had also informed all employees at the facility about the event and the actions taken.
20. The Commission asked CNSC staff to review the effects of the toxicity of yellowcake. CNSC staff explained that a critical organ to monitor upon exposure to non-calcined yellowcake is kidneys. In this event, the workers had been exposed to calcined long-lived radioactive dust and the critical organ of concern is lungs, so that a risk of toxicity is smaller than consequences of radiation. The doses estimated and reported by Cameco are relatively low and there were no indications that would cause concerns related to kidney toxicity.
  21. The Commission asked about the steps taken to restart the production. Cameco representatives responded that, after the initial investigation, they had identified and implemented necessary corrective actions prior to the safe restart of the facility. The Cameco representative described the repairs, decontamination and verification actions taken.
  22. The Commission enquired about the expected life of the calciner and asked about Cameco's age management and preventative maintenance program. The Cameco representative responded that Cameco has a robust preventative maintenance program at the Key Lake operation. One of the outcomes of the analysis of the different pieces of equipment and the revitalization of that facility was the decision to replace the existing calciner. In the meantime, the existing calciner had been maintained and repaired annually through mill maintenance and scheduled maintenance programs, as well as a preventative maintenance program. The Cameco representative added that the existing calciner would be replaced in the near future by a new one having different design. It is anticipated that the construction will be completed by June or July 2015, and that commissioning could take an additional two to three months. The existing calciner will undergo routine maintenance during the planned shutdown in May 2015, and would be used as a mainline backup should the commissioning last longer than anticipated.
  23. The Commission asked about the amount of the yellow cake released in the working area. The Cameco representative responded that the amount will be estimated later and that the efforts so far had been focused on the enhanced bioassay of the individuals potentially affected and estimation of received doses, as well as on the repair and other corrective actions to make sure that the area was safe to restart the plant.

24. The Commission asked if there were other licensees using similar calciners who need to be notified of this event and who would have to take actions or to conduct inspections of their facilities. CNSC staff responded that yellow cake is produced in facilities at Rabbit Lake, McClean Lake and Key Lake, and that the licensees Cameco and AREVA communicate regularly. CNSC staff intends to meet with these licensees to share lessons learned. At this moment, other facilities are not required to take any immediate verification activities.
25. The Commission asked if information on the event was made available to the public. CNSC staff responded that the event has been posted on both CNSC and Cameco websites.

### INFORMATION ITEMS

#### CNSC's Early Role in an Initiative for a Deep Geological Repository for the Long-term Management of Canada's Used Nuclear Fuel

26. With reference to CMD 15-M4, CNSC staff informed the Commission about the role of the CNSC in the Adaptive Phased Management (APM) approach to Canada's plan for the safe, long-term care of used nuclear fuel. CNSC staff explained that the Nuclear Waste Management Organization (NWMO) is the organization responsible for the implementation of APM. The APM includes the development of a large infrastructure project that will include a deep geological repository and a centre of expertise for technical, environmental and community studies. The presentation was focused on CNSC staff's activities in explaining the regulatory role of the CNSC to communities that are potential candidates for hosting the installation. The presentation also included information on CNSC staff's international collaboration, and on the next steps in developing radioactive waste and decommissioning regulations, and revision of the existing regulatory guides.
27. In its presentation, CNSC staff provided a brief background explanation on the NWMO activities and updated the Commission on the status of NWMO's site selection process. CNSC staff further informed the Commission about the CNSC/NWMO Service Agreement and activities of the Independent Advisory Group (IAG), and provided an extensive description of its outreach activities and open houses in the involved communities. CNSC staff also informed the Commission about its participation in activities of the International Atomic Energy Agency (IAEA) and Nuclear Energy Agency (NEA), international technical and scientific exchanges, and about visits to repository facilities in

Sweden and Finland.

28. The Commission enquired about the methods applied for an initial selection of a suitable site, and asked whether the primary criterion was based on geology or on social aspects, such as the interest expressed by a community. CNSC staff responded that, initially, NWMO had been looking for a willing and informed host community; however, as the process progresses, safety becomes the primary criterion and the list of potential hosts would be reduced based on geology and other factors.
29. The Commission further enquired about the timeline for the initiative and asked when, within this timeline, the detailed planning of a site would take place. CNSC staff reiterated that the site selection is entirely within the NWMO process, and provided more details about various stages of the NWMO's site selection procedure. At the end of the process, when a selection is made, NWMO would submit a licence application to the CNSC. At that point the CNSC would end its early role in engaging potential communities and would commence its regulatory role by assessing the application and making appropriate decisions. CNSC staff clarified that Canada does not have mandated dates in its legislation for this initiative. The timeline for site selection was established by NWMO and the publically released deadline of 2035 was used for the NWMO funding formula. CNSC staff will consider the NWMO's application when it is submitted.
30. The Commission sought clarification regarding the CNSC's early engagement and collaboration with the NWMO through the service agreement and activities within the Independent Advisory Group (IAG), while preserving an independent regulatory role for the Commission to make impartial, objective and independent licensing decisions. CNSC staff explained that they enter, from time to time, into pre-licensing agreements with organizations like the NWMO in order to further develop competence in specific areas and to keep up with the newest technology development. In this way, CNSC remains an informed regulator capable to establish high-level requirements. When an application is made, those agreements are set aside, a safety case has to be clearly established, and CNSC staff enters into the formal licensing process, during which the final decision is made by the Commission.
31. CNSC staff clarified that the CNSC is not involved in the process of site selection or decisions related to technology, but is entirely focused on its role to ensure safe operation, safety of the public and protection of the environment. However, CNSC staff has learned, through its international collaboration, of the importance of early engagement in outreach activities to make sure that the regulatory role of the CNSC is clearly understood by the public, and

- especially by the involved communities. At the same time, the CNSC's expectations are clearly communicated to the prospective applicant before a formal application is submitted.
32. The Commission enquired about alternatives for managing radioactive waste. CNSC staff responded that Canada, having an open fuel cycle, looks at a long-term underground repository as a solution for used fuel from nuclear power plants. CNSC staff explained that, under the *Nuclear Fuel Waste Act*<sup>1</sup>, the utilities are responsible for the long-term management of the waste they produce. The NWMO had been formed to implement a long-term management solution to the used nuclear fuel. The Government of Canada, after considering four recommendations by the NWMO, had chosen the APM approach, which at the end would result in a deep geological repository for used nuclear fuel.
  33. The Commission asked about research activities conducted by the NWMO to support the storage solution to be proposed in its future application. CNSC staff responded that one of the first activities of the IAG would be to carry out a review of the NWMO's research program.
  34. The Commission noted that the IAG includes primarily geoscientists and asked if a more diversified approach in the initiative is envisaged. CNSC staff responded that the group currently has five members, and that the demographics of the group might evolve with time so that expertise in different areas would be included as needed.
  35. The Commission asked CNSC staff about the experience built up through international collaboration. CNSC staff responded that all international partners had stressed the importance of the early engagement in outreach activities to make sure that the public clearly understands the role of the regulator in an initiative like this one. Another thing that had been pointed out by regulators in Finland and Sweden was the clear idea about the management change when an organization that does the research changes its role to become an applicant and submits a licence application for the construction and operation of the facility. CNSC staff also stressed advantages of building up in-house research programs and knowledge basis in order to be able to provide knowledge based assessments, analyses, suggestions and recommendations to the Commission.
  36. The Commission sought more information regarding the acceptance of this kind of project in host communities in Finland and Sweden. CNSC staff responded that in both countries local

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<sup>1</sup> Statutes of Canada, S.C. 2002, c. 23.

- communities have large powers and could easily reject the proposed projects. Regulators in both countries have made significant efforts to engage and inform involved communities about the licensing process and the role of the regulator. CNSC staff added that, in both countries, the final proposals are in communities with existing nuclear facilities, so that they are already familiar with nuclear reactors and used reactor fuel which is stored in the areas.
37. The Commission asked about the effectiveness of the CNSC staff's public engagement and about funds available for this activity. CNSC staff responded that their engagement was still in its early stage and that they were forming a database of issues raised by the public during the meetings. CNSC staff would use this database to improve the outreach material that would be presented to the public in the future. CNSC staff is also working on improvements of their communication assessment plan. CNSC staff added that direct funds for the outreach activity related to this initiative amount to some \$ 75 000. However, a broader approach that includes CNSC's own research activities involves other CNSC resources and engages the existing expertise of the whole nuclear waste division. CNSC staff added that their activities in this area are covered by the NWMO through cost recovery, as outlined in the service agreement.
38. The Commission sought more information regarding the engagement of the CNSC in pre-licensing studies in the future and about future reporting and updates. CNSC staff responded that they have started with their review of the conceptual design and post closure safety assessments for two hypothetical sites, and that the NWMO was preparing two additional studies: one on crystalline rock and one on sedimentary rock. CNSC staff added that it was suggested to NWMO to start updating the Commission on a periodic basis and that CNSC staff prepares an update about its independent research program. CNSC staff will also continue with its outreach activities. A schedule for these updating activities would be established in the future and presented to the Commission as part of CNSC staff's annual reports.
39. The Commission requested that CNSC staff prepare an update for the next annual report of the Directorate of Nuclear Cycle and Facility Regulation (DNCFR). The Commission further suggested that the material prepared for this presentation be presented to the public and be regularly updated on the CNSC's website.

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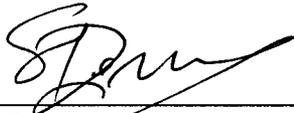
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40. In addition, the Commission is inviting the NWMO to present its triennial report<sup>2</sup> in a public proceeding of the Commission. The Triennial Report for 2014-2016 would be presented in early 2017.

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Closure of the Public Meeting

41. The meeting closed at 17:29.



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Recording Secretary

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Secretary

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<sup>2</sup> The triennial report is submitted by the NWMO to the Minister of Natural Resources Canada in compliance with sections 16(1), 16(2), 18 and 23(1) of the *Nuclear Fuel Waste Act* (S.C. 2002, c.23).

## APPENDIX A

CMD	DATE	File No
15-M1	2015-01-07	E-Docs 4610422
Notice of Meeting of February 4, 2015		
15-M2	2015-01-21	E-Docs 4622200
Agenda of the meeting of the Canadian Nuclear Safety Commission to be held on Wednesday, February 4, 2015, in the Public Hearing Room, 14 <sup>th</sup> Floor, 280 Slater Street, Ottawa, Ontario.		
15-M5	2015-02-02	E-Docs 4630651
Approval of Minutes of Commission Meeting held December 17 and 18, 2014		
15-M3	2015-02-02	E-Docs 4626810
Status of power reactor units as of February 2, 2015		
15-M4	2015-02-04	E-Docs 4627583
CNSC's Early Role in an Initiative for a Deep Geological Repository for the Long-term Management of Canada's Used Nuclear Fuel		