Minutes of the Canadian Nuclear Safety Commission (CNSC) Meeting held Thursday, November 5, 2009 beginning at 10:04 a.m. at the Saskatoon Travelodge, 106 Circle Drive West, Saskatoon, Saskatchewan.

Present:

A. Graham, Presiding Member
C.R. Barnes
A. Harvey
R.J. Barriault
D.D. Tolgyesi
M. J. McDill

M. Leblanc, Secretary
J. Lavoie, Senior General Counsel
S. Gingras, Recording Secretary

CNSC staff advisors were: G. Rzentkowski, F. Rinfret, R. Jammal, M. Santini, K. Scissons, M. McKee and S. Nguyen

Other contributors were:

- Atomic Energy of Canada Limited (AECL): B. Pilkington,
- Bruce Power Inc. (Bruce Power): F. Saunders
- Cameco Corp. (Cameco): T. Gitzel, D. Neuburger, K. Himbeault and L. Yesnik
- Hydro-Québec: P. Desbiens and A. Desroches

Adoption of the Agenda

1. The revised agenda, CMD 09-M38.A, was adopted as presented.

Chair and Secretary

2. A. Graham 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-M37, 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 August 27, 2009, Commission Member Documents CMD 09-M37 to CMD 09-M44.1A were distributed to the Members. These documents are further detailed in Annex A of these Minutes.

Minutes of the CNSC Meeting Held August 27, 2009

5. With reference to CMD 09-M39, the Commission asked about the due date for the action item detailed in paragraph 80 of the draft Minutes. The Secretary of the Commission answered that the responsible staff members provided information to the Secretariat on this topic, and that CNSC staff will provide additional information on the Secretary's request before the due date, which was set for the December 9, 2009 Meeting.

6. The Commission Members approved the minutes of the August 27, 2009 Commission Meeting as presented in CMD 09-M39.

STATUS REPORTS

Early Notification Report (ENR) No. 2009-4

Early Notification of Operational Event/Condition: *Bruce Power – Potential Level One Impairment of Emergency Coolant Injection System, Bruce A Unit 4*

7. With reference to CMD 09-M40.A, CNSC staff presented additional information regarding the Bruce Power potential level one impairment of emergency coolant injection system at Bruce A Unit 4.

8. CNSC staff explained that during the recent outage of Unit 4, a potential mechanism was identified that could have affected the operation of the emergency coolant injection system. CNSC staff provided details concerning the mechanism and added that this has conservatively been declared by Bruce Power as a potential level one impairment.

9. Bruce Power orally provided a detailed explanation of the event and noted that the investigation is still underway.

10. The Commission asked whether the configuration related to Bruce A, which has balance lines located at the bottom of each emergency core cooling system line leading into the heat transport system, could be present at other plants. Bruce Power answered that, to its knowledge, balance lines are on the side in most power plants, but added that an Operating Experience (OPEX) report and engineering analysis would be published after their completion.

11. In response to the Commission request for further details, Bruce Power explained that it expected no change in the rate of accumulation of the product that is blocking the pipe. Bruce Power added that a reservoir that would collect material could be one way to solve the problem, but that the engineering team would look at several potential solutions. Bruce Power also noted that there is no way to directly test the bottom lines for debris accumulation, but the investigation team would explore possibilities for indirect testing.

12. In response to a question from the Commission, CNSC staff explained that it was verifying whether this problem could occur at the other nuclear stations.

13. The Commission asked about the existence of a system detecting the presence of debris in the coolant. Bruce Power answered that it monitors the heat transport system debris, and that there is also a purification system attached to the heat transport system.

14. This item needs not come back before the Commission unless there is deterioration.

Early Notification of Operational Event/Condition: *Gentilly-2 Unit Outage after Shutdown System 1 Trip (SDS-1)*

15. With reference to CMD 09-M40.A, Hydro-Québec orally provided details on the Gentilly-2 unit outage after the shutdown System 1 (SDS-1) trip. Hydro-Québec noted that everything proceeded according to the design of the reactor.

16. In response to questioning from the Commission, Hydro-Québec explained that the power plant can operate with only one of the two transformers on site, but that the transfer from one transformer to the other can be slower (depending on the nature of the failure), which could cause a brief loss of power and then trip the plant. Hydro-Québec added that although this transfer had happened in the past, this was the first time that a defective relay was the cause.

17. The Commission asked whether CNSC staff is informed as soon as a system is tripped. CNSC staff replied that they are informed very quickly about this type of event in accordance with the current licence. CNSC staff added that they were satisfied with how the equipment responded during the event.

18. In response to a question from the Commission, Hydro-Québec explained that the protection relay that monitors various conditions that could be abnormal appears to have sent a false signal and prevented the breaker from functioning.

19. The Commission asked whether the preventive maintenance system involved inspection of breakers and relays. Hydro-Québec responded that a maintenance program was in place and that it would be re-examined as a result of this incident.

20. The Commission asked questions about the frequency of inspection of breakers and relays. Hydro-Québec added that the maintenance program calls for inspection of these pieces of equipment approximately every two years, allowing a certain amount of flexibility. The most recent inspection was done in June 2007. Hydro-Québec considers that it was still within the time limit for inspections.

21. This item does not require a follow-up at a Commission Meeting.

Status Report on Power Reactors

22. With reference to CMD 09-M41, which includes the Status Report on Power Reactors, CNSC staff presented updates on Nuclear Generating Stations (NGS).

23. CNSC staff noted that there was no further update to the Status Report.

Updates on items from previous Commission proceedings

Atomic Energy of Canada Limited (AECL): Follow-up on Chalk River Laboratories NRU Outage and Return-to-Service Activities

24. With reference to CMD 09-M42.1 and 09-M42.1A, AECL provided a summary of the current status of the NRU Reactor, the organizational and technical root causes of the event, non-destructive examinations, the corrosion mitigation strategy, the vessel repair, the NRU restart protocol, and communications with stakeholders.

25. With reference to CMD 09-M42, CNSC staff provided an update of activities related to the NRU Reactor. CNSC staff noted that the activities relating to the return to service are being done in accordance with the NRU restart protocol. CNSC staff added that the repairs are being done in accordance with the required CSA N285 standards, and that it is working with the Technical Standards and Safety Authority (TSSA) on appropriate verifications.

26. CNSC staff also indicated that it is developing a detailed project plan to oversee the return-to-service activities. CNSC staff noted that it is verifying the work done under the extended activities project as it relates to the relicensing of the NRU in 2011. CNSC staff added that it agreed with the approach proposed by AECL to come up with a corrective action plan to address the organizational causes of the event.

27. The Commission expressed concerns regarding the safety culture at AECL, since the results of the root cause analysis show organizational failure. The Commission asked AECL about the actions to be taken to improve the safety culture. AECL responded that it has used the outage update meetings as an opportunity for management to promote cultural change. AECL added that it intends to implement programs that will continue to support the change in safety culture. CNSC staff stated that its communications with higher levels of management indicate that a noticeable change in AECL's safety culture is occurring.

28. The Commission asked about the actions taken by AECL to implement changes not only in higher levels of management, but also in the lower levels. AECL mentioned the existence of a leadership development program, investments in the staffing levels and processes related to the isotope production facilities at the NRU reactor, and a trial membership with the World Association of Nuclear Operators, which requires an annual assessment of the safety culture in place.

29. The Commission asked CNSC staff about the lessons learned from this event. CNSC staff responded that it was establishing a unique regulatory program for AECL, which includes not only technical reviews but also interviews with AECL staff to verify the safety culture at the facility. CNSC staff committed to request AECL to hire an external consultant if CNSC staff's findings show that AECL cannot successfully implement an acceptable safety culture. CNSC staff further noted that AECL has implemented an impact program and event-free tools which forced AECL staff to be more conscious of safety. CNSC staff added that this change in mentality is demonstrated by an increase of reporting of problems, which CNSC staff finds positive.

ACTION (date not determined – many opportunities in the future for AECL update)

30. In response to a question from the Commission on the awareness of the AECL Board of Directors on the issue, AECL explained that the Board of Directors showed a high level of interest and concern of the issue, and that the Board Science, Technology and Nuclear Oversight Committee has held a number of special meetings to get information on the progress of the outage.

31. The Commission asked for quantitative information on the level of air ingress and formation of nitric acid in the system, which is the cause of corrosion issues. AECL answered that while it cannot provide specific numbers, it has investigated the actions to be taken to improve conditions in the J-Rod annulus, such as the installation of a more effective CO_2 distribution system and sealing the source of air intake in the system.

32. The Commission requested more quantitative information on the air ingress issue during the next update from AECL on the NRU outage activities. — ACTION by January 2010

33. The Commission asked for more information on the tools to be developed or the actions to be taken in order to detect corrosion problems. AECL responded that it will be identifying, through its fitness-for-service assessment, the appropriate interval for inspections of leaks in the vessel. AECL added that the tools developed during the outage could be used during future outages to confirm the mitigation of corrosion.

34. The Commission asked whether CNSC staff knew of the existence of sampling coupons that were taken from the NRU vessel wall during the 1990s and not tested. CNSC staff answered that it did not know of the existence of the coupons, and that it was investigating the reasons why. The Commission further asked AECL if its expert staff was aware of the existence of these coupons at the time of relicensing in 2005. AECL answered that the people tasked with the condition assessment were not aware, and that this was symptomatic of the changes that need to be done to get a broader sharing of information within the organization.

35. The Commission asked AECL to provide at the next Commission Meeting an updated organizational chart that reflects the changes in management. — ACTION by December 2009

36. The Commission asked CNSC staff about the actions that have been taken or could be taken to address the impacts that the organizational changes could have on NRU operations. CNSC staff confirmed that AECL has undergone considerable organizational changes, mainly at the upper levels of management. CNSC staff noted that it wants AECL to implement indicators to measure progress and to ensure that the process is not stalled. CNSC staff stated that the vessel leak is not attributable to the current management, but that there is a long history of problems before the event. CNSC staff added that it was reviewing the results of AECL's safety culture assessment.

37. In response to a question from the Commission on the expected life of the repaired vessel, AECL explained that the state of the vessel will be as defined in the fitness for service document to be produced in support of the restart. AECL added that it has a target to establish a service life of the vessel beyond 2016. AECL intends to rely on future inspections to show that the corrosion mechanism is properly mitigated. CNSC staff concurred with AECL and indicated that AECL has firmly committed to implement a different operating regime that would allow AECL to inspect the NRU reactor in more detail every year.

38. The Commission inquired if the problems with the fuel rod cladding could delay the refuelling of the reactor. AECL explained the details of the actions taken to correct the issues relating to the fuel defects. AECL stated that having located the defects, it believes that it would be successful in completing an investigation of the cause of the defects and taking appropriate action. CNSC staff confirmed that AECL's investigation is underway, and indicated that fuel failure in the core is not necessarily highly safety significant as long as the primary system is properly cleaned and AECL can rapidly determine the cause of the problem.

Cameco Corporation: Updates on McArthur River, Key Lake and Rabbit Lake Operations

39. With reference to CMD 09-M44.1 and CMD 09-M44.1A, Cameco provided updates on the following items:

    - the development and implementation of fire protection programs at the Key Lake, Rabbit Lake and McArthur River Operations;
    - the status of the commissioning of the molybdenum/selenium removal circuit at Key Lake;
    - development of a plan and schedule for stabilization of the pit walls of the Deilmann tailings management facility at the Key Lake Operation;
    - development of a waste rock management plan for the Key Lake Operation;
    - the development of a plan and schedule for reclamation of inactive facilities at the Rabbit Lake Operation; and
    - remediation of a 2008 seepage event at the Rabbit Lake Operation.

40. Cameco is of the view that it has made steady progress in each of these areas, and that it has met all specific commitments arising from the relicensing process.

41. With reference to CMD 09-M44, CNSC staff provided a summary of its status report for the Key Lake, Rabbit Lake and McArthur River facilities in the areas of fire protection, reclamation and waste rock management, tailings management and effluent treatment.

42. The Commission expressed concerns regarding the levels of selenium in Delta Lake being above the Canadian Water Quality Guidelines, and Cameco's position that the best available technology for removal of selenium is already being used. The Commission asked Cameco for its plans to further reduce selenium in Delta Lake. Cameco commented that the concerns with selenium were determined when an environmental risk assessment was completed on the potential effects of mill effluent on the downstream environment, whereas earlier environmental impact assessments had not identified this concern. Cameco added that it believed that the protection of Delta Lake was an important step to ensuring the protection of Wheeler River downstream. Cameco added that, based on recent data, it believes that it has now achieved selenium levels in Delta Lake that ensure the protection of Wheeler River.

43. The Commission asked if selenium levels could be lowered by lowering production rates. Cameco responded that the selenium levels in Delta Lake are dependent on how much treated water is released and that this volume is related to production amounts.

44. In response to questions from the Commission on the selenium levels issue, CNSC staff explained that there are now controls in place for selenium where none existed before. CNSC staff added that Cameco has demonstrated due diligence by implementing state-of-the-art selenium control measures. CNSC staff also indicated that environmental monitoring, especially of the fish, will be done to identify any need for further action. CNSC staff further noted that there were two driving factors for requiring Cameco to implement selenium control measures: (1) the lack of selenium control in mill effluent, and (2) measured verified impacts found in Delta Lake that were not in accordance with the McArthur environmental assessment predictions of no impact. CNSC staff added that recent developments in the knowledge of selenium as a contaminant led to a change in the Saskatchewan Surface Water Quality Objective for selenium from ten to one microgram per litre in 2006. CNSC staff also noted that Cameco can now prevent very high selenium loadings and thus keep selenium loading to a consistent level of less than 40 kg/year.

45. In response to further questioning from the Commission, CNSC staff explained that the primary issue with selenium is the loading and not the concentrations. CNSC staff stated that the models predict a stabilization of selenium-related issues within Delta Lake.

46. In response to further information requested from the Commission on options for the removal of selenium, Cameco answered that it has done an exhaustive review of options and a tremendous amount of research on selenium impacts on the environment. CNSC staff confirmed that Cameco has performed a thorough research and assessed all possible options. CNSC staff added that Cameco has implemented all reasonable measures achievable at this time, but that CNSC staff expects Cameco to continue to look for future opportunities to further reduce selenium releases.

47. The Commission asked about possible causes for the sloughing event in 2009. Cameco answered that it was a relaticely small and localized event, and that Cameco believes that the short-term measures taken for the last few years minimized the risk of large sloughing event.

48. The Commission asked for more information on the actions taken by Cameco to prevent sloughing, even after raising water levels. Cameco answered that the slope stabilization will be calculated based upon the final water levels expected for the facility, and that the slope will be flattened to maintain a sufficient factor of safety. CNSC staff indicated that the sloughing event was probably largely caused by heavy precipitation, and that CNSC staff is satisfied with Cameco's proposals.

49. The Commission expressed its disappointment for not having details of the plans for the Deilmann North waste rock pile cover design. In response to the Commission's request for more details on the cover design, CNSC staff explained that the detailed cover design is not expected to go through regulatory approval before the year 2014, and that there is still an extensive amount of information to be gathered. CNSC staff stated that it is looking for long-term sustainability.

50. The Commission asked for more information regarding the fire inspection at Rabbit Lake in September 2009. CNSC staff stated that the 18 directives and 2 action notices showed the extent of neglect of several areas of the site. Cameco stated that the audit was unacceptable and disappointing, and that Cameco took immediate action to rectify the situation. Cameco stated that it considers this to be an isolated event and that this situation will not re-occur.

51. The Commission asked Cameco for possible causes of the fire protection issues. Cameco responded that that there was a change in expectations from the CNSC regarding fire protection. Cameco added that it is now required to have a separate fire protection program. Cameco also noted that there was a learning curve associated with the introduction of new requirements, and that upgrades of facilities that do not meet the *National Fire Code of Canada*[1] and the *National Building Code of Canada*[2] and cannot be grandfathered were also required. CNSC staff commented that its expectation is that Cameco have a program that meets regulatory requirements both for the fire protection program and its implementation, and that the condition on fire protection included in the licence is for Cameco to develop a program in order to properly manage fire safety. Cameco stated that it expects to meet requirements for fire protection within the next six months.

52. The Commission requests CNSC staff to provide an update on this issue to the Secretariat of the Commission by June 2010. ACTION by June 2010

53. The Commission asked for more information on the impact of selenium on waterfowl eggs. CNSC staff explained that fish-eating waterfowl are accumulating selenium, but there are so few of them because the area is not good nesting habitat that it is not possible to properly measure whether there are effects or not. However, an extensive investigation with insect-eating tree swallows also showed accumulation of selenium but not to levels that could result in deformities or loss of offspring.

54. In response to a question from the Commission on studies done on the muskrat population in the area, CNSC staff explained that there is selenium accumulation in organ and tissue levels, but that muskrats are continually moving in and out of the contaminated area, which allows them to recover from the impacts of selenium in their systems.

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[1] National Fire Code of Canada 2005. Prepared under the auspices of the Canadian Commission on Building and Fire Codes and published by the National Research Council of Canada

[2] National Building Code of Canada 2005. Issued by the Canadian Commission on Building and Fire Codes, National Research Council of Canada, dated 1995, as amended from time to time.

55. In response to further questioning from the Commission on the sampling of waterfowl and fish in the area, CNSC staff explained that the tissue sampling for muskrat, bird and bird eggs were special studies, and that fish sampling has always been a routine sampling, generally every three years. When questioned whether this secondary kill could affect the fish population as a whole, neither CNSC staff nor Cameco could confirm whether this was the case.

56. The Commission asked whether Cameco has the capacity to treat excess water in the Deilmann Tailings Management Facility (DTMF) in order to maintain water levels during cutback of the slope. Cameco answered that it has significantly increased the capacity of the reverse osmosis treatment plant at Key Lake to help control water levels in the DTMF.

57. In response to a question from the Commission on the capacity of the DTMF, Cameco explained that it will be submitting a project description for the Key Lake extension project which will be addressing the capacity and the proposed elevation in the DTMF. Cameco added that if this project is approved, there will be capacity for many decades of tailings resulting from the activities at the Key Lake facility.

58. The Commission commented that important attention should be paid to safety while performing slope excavation and cutting work. Cameco indicated that the detailed design for the planned slope stabilization work will be completed by the end of 2010, and that that design will include a comprehensive safety plan.

Closure of the Public Meeting

59. The meeting closed at 2:45 p.m.

Sophie Gregoire — 2009-12-15

Recording Secretary — Date

M L — 14/12/09

Secretary — Date

APPENDIX A

CMD DATE File No
09-M37 2009-10-05 (6.02.01)
Notice of Meeting of November 5, 2009

09-M38 2009-10-21 (6.02.02)
Agenda of the meeting of the Canadian Nuclear Safety Commission to be held on Thursday, November 5, 2009, at the Saskatoon Travelodge, 106 Circle Drive West, Saskatoon, Saskatchewan

09-M38.A 2009-10-30 (6.02.02)
Updated agenda of the meeting of the Canadian Nuclear Safety Commission to be held on Thursday, November 5, 2009, at the Saskatoon Travelodge, 106 Circle Drive West, Saskatoon, Saskatchewan

09-M39 2009-10-20 (6.02.03)
Approval of Minutes of Commission Meeting held August 27, 2009

09-M40 2009-10-20 (6.02.04)
Early Notification Report No. 2009-4 – No new events to report

09-M40.A 2009-10-30 (6.02.04)
Early Notification Report No. 2009-4 –
Bruce Power: Potential Level one impairment of Emergency Coolant Injection System, Bruce A unit 4
Hydro-Québec: Gentilly-2 Unit Outage after Shutdown System 1 trip (SDS-1)

09-M41 2009-10-20 (6.02.04)
Statur Report on Power Reactors units as of October 20, 2009

09-M42 2009-10-21 (6.02.04)
Updates in items from previous Commission proceedings – Atomic Energy of Canada Limited – Follow-up on Atomic Energy of Canada Limited's Chalk River Laboratories NRU outage and return-to-service activities – Oral presentation by CNSC staff

09-M42.1 2009-10-21 (6.02.04)
Updates in items from previous Commission proceedings – Atomic Energy of Canada Limited – Follow-up on Atomic Energy of Canada Limited's Chalk River Laboratories NRU outage and return-to-service activities – Oral presentation by Atomic Energy of Canada Limited

09-M42.1A 2009-10-21 (6.02.04)
Updates in items from previous Commission proceedings – Atomic Energy of Canada Limited – Follow-up on Atomic Energy of Canada Limited's Chalk River Laboratories NRU outage and return-to-service activities – Oral presentation by Atomic Energy of Canada Limited – Supplementary Information

09-M43 2009-10-20 (6.02.04)
Updates on items from previous Commission proceedings –
SRB Technologies (Canada) Inc.: SRBT Status on meeting its financial commitments for the period of August 8 to October 20, 2009

09-M44 2009-10-20 (6.02.07)
Cameco Corporation: Updates on McArthur River, Key Lake and Rabbit Lake Operations – Oral presentation by CNSC staff

09-M44.1 2009-10-15 (6.02.04)
Cameco Corporation: Updates on McArthur River, Key Lake and Rabbit Lake Operations – Oral presentation by Cameco Corporation

09-M44.1A 2009-10-29 (6.02.04)
Cameco Corporation: Updates on McArthur River, Key Lake and Rabbit Lake Operations – Oral presentation by Cameco Corporation – Supplementary Information