

Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant Cameco Corporation

Subject Application to Renew the Cigar Lake Project
Uranium Mine Construction Licence

Hearing
Date November 6, 2009

RECORD OF PROCEEDINGS

Applicant: Cameco Corporation

Address/Location: 2121 – 11th Street West, Saskatoon, Saskatchewan

Purpose: Application to renew the Cigar Lake Project Uranium Mine Construction Licence

Application received: August 6, 2009

Date of hearing: November 6, 2009

Location: Saskatoon Travelodge Hotel, 106 Circle Drive West, Saskatoon, Saskatchewan

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See appendix A	

Licence: Renewed
Date of Decision: November 6, 2009

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Introduction

1. Cameco Corporation (Cameco) has applied to the Canadian Nuclear Safety Commission¹ (CNSC) for the renewal of the Cigar Lake Project Uranium Mine Construction Licence UMCL-MINE-CIGAR.02/2009, which expires on December 31, 2009. In the current application, Cameco is seeking approval to complete the mine remediation and resume normal mine development activities during a four-year licence term.
2. The Cigar Lake Project is located within the Athabasca Basin of the Precambrian Shield in northern Saskatchewan, about 660 kilometers north of Saskatoon. The mine site is located east of Cigar Lake at the south end of Waterbury Lake. The ore lies approximately 420 to 450 meters below surface, in a highly altered clay and sandstone host rock, positioned at the unconformity between the basement rock and overlying sandstone. The sandstone is fully saturated with water at hydrostatic pressure.
3. The original three-year licence for this project was granted in December 2004. Following the water inflow events in 2006 that flooded the mine workings and a shaft in development, the Commission granted a two-year amended construction licence in November 2007 authorizing Cameco to conduct remediation activities from the surface. The licence was further amended by a panel of the Commission in June 2008 to allow Cameco to proceed with mine dewatering and limited scope remediation activities underground.
4. After a new inflow forced suspension of mine dewatering in August 2008, Cameco determined that it would be beneficial to complete a technical assessment and root cause analysis of the new inflow. This work has been completed and abatement of the source of the August 2008 inflow is completed. Cameco began dewatering of the mine on October 22, and plans to re-enter the underground to secure and assess the mine, so that restoring of underground mine services and facilities can begin.

Issues

5. In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*² (NSCA):
 - a) if Cameco is qualified to carry on the activity that the amended licence would authorize; and
 - b) if, in carrying on that activity, Cameco would make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

¹ In this *Record of Proceedings*, the *Canadian Nuclear Safety Commission* is referred to as the “CNSC” when referring to the organization and its staff in general, and as the “Commission” when referring to the tribunal component.

² Statutes of Canada, S.C. 1997, c. 9.

Public Hearing

6. The Commission, in making its decision, considered information presented for a public hearing held on November 6, 2009 in Saskatoon, Saskatchewan. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*³. During the public hearing, the Commission received written submissions and heard oral presentations from CNSC staff (CMD 09-H12 and CMD 09-H12.A) and Cameco (CMD 09-H12.1, CMD 09-H12.1A and CMD 09-H12.1B). The Commission also considered submissions from two intervenors (see Appendix A for a detailed list of interventions).

Decision

7. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Proceedings*, the Commission concluded that Cameco is qualified to carry on the activity that the licence will authorize. The Commission also determined that Cameco, in carrying on that activity, will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed. Therefore,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews the Uranium Mine Construction Licence issued to Cameco Corporation for its Cigar Lake Project located in the Athabasca Basin of northern Saskatchewan. The licence, UMCL-MINE-CIGAR.00/2013, is valid from January 1, 2010 to December 31, 2013 unless suspended, amended, revoked or replaced.

8. The Commission includes in the licence the conditions recommended by CNSC staff as set out in the draft licence attached to CMD 09-H12, with the following change: the licence (Appendix D) is modified to show clear distinction between required regulatory limits and reportable values that would include interim action levels.
9. With this decision, the Commission requests that Cameco and CNSC staff prepare an interim report that will provide a summary of the remediation activities and safety performance of the Cigar Lake Project. The reports shall be presented at a proceeding of the Commission in approximately May 2011.

³ Statutory Orders and Regulations, S.O.R./2000-211.

Issues and Commission Findings

10. In making its decision, the Commission considered a number of issues related to Cameco's qualification to carry out the proposed activities and the adequacy of the proposed measures for protecting the environment, the health and safety of persons, national security and international obligations to which Canada has agreed. The Commission's findings, based on the consideration of all of the information and submissions available on the record for the hearing, are summarized below.

Radiation Protection

11. CNSC staff informed the Commission that Cameco has in place a Radiation Protection (RP) Program Manual that describes a comprehensive RP Program for the remediation, construction and operation of the Cigar Lake mine. Core activities include management oversight of RP, ongoing RP training, radiation exposure and dose control, contamination control, dosimetry management, measurements and monitoring and the Radiation Code of Practice.
12. Cameco informed the Commission on the improvements implemented to its RP Program. Cameco said that changes to instrumentation, which have improved the sensitivity and reliability of monitoring devices, as well as increased staffing have strengthened radiation protection at Cigar Lake in preparation for re-entry to the mine, as part of Phase 2, 3, 4 and 5 of the remediation plan.
13. CNSC staff stated that full implementation of the RP Program, paused after the water inflow event, will be continued with resumption of mine dewatering and re-entry into the mine. CNSC staff added that minor deficiencies identified during the recent revision of the program documents would not compromise the health and safety of workers, and will be addressed and corrected by Cameco. Verification of elements of the program was included in compliance inspections conducted by CNSC staff and provincial inspectors.
14. CNSC staff rated the program and its implementation as meeting requirements.
15. CNSC staff reported that routine compliance verification activities included on-site inspections and review of unusual occurrence reports, and monthly, quarterly and annual compliance reports. CNSC staff noted that there have been no unusual occurrences reported since the mine water inflow event and no enforcement actions pertaining to radiation protection were issued as a result of these inspections.
16. CNSC staff further reported to the Commission that Phase 4 of the Remediation Project may include the removal of significant amounts of equipment from the mine for salvage or disposal in appropriate areas. CNSC staff stated that it will verify the implementation of Cameco's radiation clearance monitoring procedures to ensure that radioactive contaminated material is stored in appropriate locations and not released from the site.

17. The Commission sought more information on the removal of equipment from the flooded mine for salvage or disposal and asked about the level of its contamination. Cameco responded that there is an extensive list of equipment that needs to be assessed in terms of whether it could be salvaged or should be disposed. Cameco noted that the equipment may be contaminated; however, since the development at Cigar Lake did not reach into the ore body, the level of contamination is believed to be low.
18. Cameco also informed the Commission on radiation exposure to workers during the expiring licence period. Cameco stated that the full-time equivalent effective dose for 2008 was 0.13 millisieverts (mSv), far below the regulatory limit. No workers received an effective dose in excess of the regulatory limits, which are 50 mSv/y and 100 mSv per five years. Cameco added that it continues to routinely monitor the area to ensure that workers' exposures are as low as reasonably achievable.
19. Based on the above information and considerations, the Commission concludes that Cameco has made adequate provision for the protection of people from radiation at the Cigar Lake Project.

Conventional Health and Safety

20. Cameco informed the Commission that it had adopted safety culture principles promoted by the International Atomic Energy Agency (IAEA) that include safety as a first priority, accountability, critical role of safety leadership, and important role of training and learning in development of safety culture.
21. Cameco added that improved decision-making, based on formal risk assessment processes, is another important aspect of Cigar Lake Project's safety culture. Accordingly, Cameco developed new divisional standards for mine development coupled with a new corporate mining technical oversight process. In addition to the corporate standards and technical oversight process, risk assessments are used to assess ongoing developments and changes on the site. A cornerstone of risk-based planning, assessment and implementation is the application of hold points, which represent key points in the project with identified prerequisites that must be satisfied to allow activities to proceed.
22. Cameco further informed the Commission that it had implemented a corrective action protocol and a quality monitoring system for safety critical items acquired for the site.
23. Cameco stated that it had implemented a revised Safety and Health Management Program to enhance identification and mitigation of risks. The revised program includes provisions for planned inspections, pre-use inspections, a safety permit system, occupational health committees, health centre operation, incident investigations and the management of safety equipment. CNSC noted that the Safety and Health Management Program has increased emphasis on risk assessment and risk management and was designed to reduce or eliminate all identified hazards.

24. CNSC staff noted that Cameco has improved a number of programs to increase staff and contractor awareness of health and safety issues, and rated the program and its implementation as meeting requirements.
25. CNSC staff reported that inspections with regard to safety and health management had been carried out by CNSC Project Officers and Saskatchewan Ministry of Advanced Education, Employment and Labour (Saskatchewan Labour) inspectors during the review period. All contraventions under Saskatchewan Labour's *Occupational Health and Safety Regulations* and "Action Notices/Recommendations" under the *Nuclear Safety and Control Act* had been adequately addressed by Cameco.
26. Cameco presented a historical overview of the Cigar Lake Project safety performance for the 2005 – 2009 period, and reported that the project's lost-time frequency level was less than half the average for Saskatchewan's mining industry, with one lost-time injury in 2009. Cameco noted that such a performance had been achieved during remediation of the 465 metre level inflow, which had involved drilling, pouring concrete and grout injection by contractors with limited on-site experience at Cigar Lake.
27. The Commission sought more details about methods used to calculate severity and lost time injury frequency. Cameco explained that it reports both severity and lost time injury frequency according to the standards used in the Province of Saskatchewan.
28. With respect to contractors' participation in safety initiatives and training, Cameco informed the Commission that it had initiated the contractor safety summit as an annual event in 2008, to share best practices and promote safety culture among contract workers. The last event took place in Saskatoon on October 2009, gathering 27 individuals from 11 companies.
29. The Commission asked for explanation for the changes in ratio of contractors-to-Cameco working hours. Cameco explained that the number of contractor hours would tend to decrease or increase depending on the nature and amount of work that is taking place; reduced surface construction and focussing on remediation activities would reflect in a lower number of contractor hours. Another factor that contributed to increased Cameco hours was the implementation of increased contractor oversight by Cameco since 2006, to ensure that planning, execution and compliance with plans, procedures and work instructions are assured.
30. Based on this information, the Commission is satisfied that Cameco has made adequate provision for the protection of persons from conventional hazards at the Cigar Lake Project.

Environmental Protection

31. To determine whether Cameco will make adequate provisions to protect the environment while carrying out the proposed remediation activities at the Cigar Lake site, the Commission considered the potential for these activities to adversely affect the environment.

Environmental Management Program

32. Cameco informed the Commission about its Environmental Management Program at Cigar Lake, which ensures that the surrounding environment is minimally impacted by site activities. Core activities of the program include ongoing effluent monitoring, environmental information gathering, and spill prevention and response.
33. CNSC staff informed the Commission that the environmental protection policies, programs and procedures implemented by the Cigar Lake Project are incorporated into the Environmental Management Program which had been significantly revised in October 2007 to reflect additional monitoring stations and to harmonize the monitoring program with that of Saskatchewan Ministry of Environment (Saskatchewan Environment). The Program was arranged according to the International Organization for Standardization (ISO 14001).
34. CNSC staff reported that it had conducted a review of the Environmental Protection Program area to assess the adequacy with respect to the CNSC S-296 standard, *Environmental Protection Policies, Programs and Procedures for a Class I Nuclear Facility and Uranium Mines and Mills*⁴. It was concluded that the environmental policy, identification of environmental aspects, the use of objectives and targets, roles and responsibilities, communication, emergency preparedness and response, and documentation processes have met expectations.
35. CNSC staff further reported that it had conducted, together with Saskatchewan Environment inspectors, regular compliance inspections to assess site facilities and operations with respect to various aspects of the Environmental Management Program. All CNSC action notices and recommendations identified within inspections had been adequately addressed by Cameco.
36. CNSC staff further informed the Commission that Cameco had submitted its *2008 Annual Environmental Report* for the Cigar Lake project, which has been reviewed by CNSC staff. CNSC staff stated that it is of the opinion that the Environmental Protection Program area will address any environmental considerations resulting from the proposed activities, including non-routine events that may arise.
37. CNSC staff concluded from the results of the compliance program activities that the Cigar Lake Environmental Management Program and its implementation meet requirements.

Environmental Monitoring

38. With respect to radiation protection monitoring reporting, the Commission expressed concerns that sampling frequency was not defined in the licence conditions. CNSC staff explained that the reporting includes environmental monitoring reports, the program being realized through consultation with the Province of Saskatchewan, and that CNSC staff wanted to maintain some flexibility so that potential changes or improvements to the monitoring program would not require a hearing or modification of the licence by the Commission.

⁴ Published by CNSC in March 2006, ISBN 0-662-43040-9

39. Cameco provided details about its mine dewatering systems and procedures that have been designed to ensure environmental protection. Cameco stated that all piping from the borehole 465-metre level pumps is now equipped with secondary containment and includes leak-detection probes. It is inspected regularly, to identify any release of water to secondary containment.
40. Cameco added that, as a preparatory measure for the resumption of dewatering, it has enhanced communication and co-ordination with the Rabbit Lake laboratory to ensure timely turnaround of treated water pond fill analyses. This action is taken as a response to expected increase in number and frequency of requests for analyses, which may require laboratory access on a 24-hour per day basis during the final stages of dewatering.

Water Management and Releases

41. With respect to water management, the Commission asked about the expected amounts of treated water during the Phase 4 and Phase 5 activities, and potential releases of untreated water in the case of insufficient treating capacity. Cameco responded that the amount of treated water would be the limit for the release to the environment, and that untreated water would not be discharged to the environment.
42. The Commission inquired on the quality of water effluents, and asked about contaminants released to the environment. Cameco responded that only a limited amount of water had been discharged over the last couple of years. Samples of the water were regularly collected and analysed prior to its release. The analyses, including data for molybdenum, selenium, chlorides, carbonates and other contaminants, have shown that the discharges have met all of the regulatory limits.
43. Northern Saskatchewan Environmental Quality Committee (NSEQC), in its intervention, supported the renewal of the Cigar Lake construction licence and noted that Cameco had carefully explained the reasons for the proposed redirection of regular effluent discharges from Aline Creek to the middle of Seru Bay of Waterbury Lake. However, NSEQC stated that it still has concerns about changing this discharge point of the mine regular inflow, and expressed its hope that this issue would be resolved through the ongoing environmental assessment. NSEQC added that it had received a letter from Cameco with assurances that the Cigar Lake water management plan will be discussed with the NSEQC.
44. The Commission sought more information on the interim action levels for authorized effluent discharge, presented by CNSC staff in the Appendix D of the proposed construction licence. CNSC staff explained that action levels have been included in the licence, as an interim measure, with intention to show transparency to the public with respect to regulatory oversight of the key parameters of interest, in comparison to effluent limits.

45. Cameco explained its view regarding incorporation of the action levels in the licence and stated that it sees action levels as an operational tool that indicates how the operation is functioning, rather than a regulatory limit. Cameco suggested that action levels be incorporated in a code of practice instead of in a licence condition, and noted that, since action levels are internal operational measures that might be changed rather often, every change may have to be approved by the Commission if they are included in the licence. Cameco also suggested that, for the sake of transparency, action levels could be posted on the company's web site or made publicly available in some other way. In this regard, the Commission authorizes the director of CNSC Uranium Mines and Mills Division to approve all hold points related to this project; licence amendments, if any, will be approved by the Commission.

46. The Commission expressed its intention to introduce in operating licences values for authorized effluent discharge and include action levels as a proactive disclosure of what has been measured and against which standard. In that sense, standard values, actual measured values and triggers for concern that initiate appropriate procedures should be clearly indicated in licence conditions and should be reported by a licensee. The intention of the Commission has not been to use these values as regulatory limits.

Events

47. Cameco informed the Commission that there were no spills in 2008, and reported that on March 18, 2009 about 1400 cubic metres of treated water from the mine was released to the environment from monitoring ponds due to damages in the pond liners caused by ice movement. Cameco added that there was no significant effect to the environment, since the ponds hold already treated mine water that awaits its release to the environment. Cameco stated that the design of the pond liners had been changed to avoid future occurrences.

48. The Commission sought more information about pond liner materials and asked if the damaged liner was appropriate for harsh winter conditions. Cameco responded that the liners were made of a high density polyethylene, which is low temperature resistant and noted that the damage had been caused by moving ice that was exceptionally thick. Cameco added that it was continually trying to find a solution for physical damage to the liner caused by moving ice.

49. Asked to comment on the event, CNSC staff responded that Cameco had reported the event to CNSC and also to Saskatchewan Environment Spill Response Centre. CNSC staff noted that only treated effluent water of good quality had been released.

Conclusion on Environmental Protection

50. Based on this information, the Commission is satisfied that Cameco is making adequate provisions at its Cigar Lake Project to protect the environment.

Operational Performance

51. The Commission examined Cigar Lake's operational performance in order to establish the adequacy and effectiveness of Cameco's approach to safe operation of the facility. The area has been divided in four sub-programs encompassing mine operations, process operations, construction operations and fire protection. CNSC staff rated all sub-programs and their implementation as meeting requirements.
52. The Commission expressed concerns about the level of presented information and lack of results of numerous conducted studies and evidence submitted in support of the outcomes of those studies. Cameco responded that the results of all conducted studies had been presented to CNSC staff, and that the documents presented to the Commission represent higher-level information. Cameco added that it is ready to provide information with higher level of details, if directed so. CNSC staff confirmed that detailed technical information had been obtained from Cameco through several reports and webcast teleconference, and that Cameco has been asked to compile the results of all studies conducted after the initial flooding. This information, if requested, could be tabled to the Commission. The Commission concluded that technically sound and consistent information should be presented in public documents and during the Commission proceedings. The Commission indicated that it does not necessarily need significant additional documentation, but that it rather expects the proponent and CNSC staff to provide adequate and more fulsome information on key matters or issues.

Mine Operations

53. Cameco informed the Commission on its revision to the basic mine design, as a result of the extensive geoscience work and the operational experience of Cameco's Mining Division. Cameco stated that an overview of the anticipated changes had been presented to representatives of Saskatchewan Labour. The presented revisions include expanded ground freezing and new water management strategy, as well as moving the development away from the unconformity.
54. CNSC staff reported to the Commission that, during the review period, CNSC staff, Saskatchewan Environment and Saskatchewan Labour had carried out regular compliance inspections of various aspects of the surface mining facility. CNSC staff added that Cameco had addressed all the Action Notices and Recommendations in a satisfactory and timely manner, and that necessary processes and systems are now in place to carry out the identified planned activities associated with Remediation Project Phases 1, 2, 3, 4, and development of Shaft 2.

55. In its intervention, the English River First Nation supported the renewal of the Cigar Lake construction licence and emphasized that this project affects traditional ways of survival, hunting, fishing and trapping, but at the same time mining now replaces the traditional ways of making a living for northern communities. The English River First Nation expressed its concerns that its ability to share benefits of this project might be limited by lack of education of its people for higher level jobs.
56. The Commission inquired about Cameco's recruitment practice and job opportunities for the neighbouring communities. Cameco responded that it has a Northern Affairs office in La Ronge where it keeps a proactive approach to identifying qualified individuals from all of the communities, including the English River First Nation. Cameco added that it has an extensive and positive relationship with numerous post-secondary institutions in the north, and that it is involved with high schools to help them to identify talented students and orient them towards engineering or other professional and technical positions with Cameco.

Process Operations

57. CNSC staff reported to the Commission that Cameco had provided a revised Process Operations Program, which includes surface operations of mine dewatering, effluent treatment, sewage treatment and human consumptive water supplies; however, the underground processing operations have not been installed due to the flooded conditions. CNSC staff noted that the ongoing improvements throughout the program areas are well documented.
58. Cameco informed the Commission on the progress made in dewatering the mine and noted that the water management strategy employed at the Cigar Lake Project has been completely rebuilt to ensure continued safe access to the mine dewatering system in the worst-case inflow scenario. The water management system now consists of five separate operations: water collection and handling within the mine, mine dewatering, water storage, water treatment and effluent release. The capacity of the mine dewatering system will be increased progressively to reach capacity to continuously remove 1,900 or more cubic metres per hour (m^3/h), which represents 50 % more than the maximum predicted inflow (installed pumping capacity will progressively reach 2 500 m^3/h). This capacity will be achieved using several different systems operating in parallel in order to increase overall system reliability.
59. Cameco explained that the water treatment plant at Cigar Lake has a capacity of 550 m^3/h , and with the recently installed contingency water treatment system now has a total capacity of 2 550 m^3/h . The total surface storage capacity of the system is 104 000 m^3 . Cameco added that it had secured regulatory approval to discharge treated effluent at rates up to 1100 m^3/h during non-routine events.

60. Updating the Commission on its dewatering efforts, Cameco stated that it was expecting to take six to twelve months to dewater and secure the mine, depending on conditions of the shaft and underground workings.
61. The Commission inquired on the adequacy of pumping capacity and status of backup power. Cameco responded that current pumping capacity matches the projected catastrophic water inflow, and would be gradually increased for more security, reliability and redundancy. Cameco reiterated that it has 104 000 m³ of surface storage capacity and added that the mine, once dewatered, could operate as a storage area as well, which provides storage capacity of almost 200 000 m³. With respect to the backup power, Cameco stated that it has diesel generators on site, so that pumping and other services at the site could be maintained independently from the electrical power grid.

Construction Operations

62. CNSC staff informed the Commission on its expectation that the licensee use managed processes to construct and manage construction, to commission and to maintain the integrity of the constructed facilities, and take all reasonable precautions to protect the workers and to control the release of nuclear and hazardous substances into the environment. Key elements of these precautions and associated controls are provided through the following programs related to construction operations:
 - Project Management Program;
 - Construction Management Program;
 - Commissioning Program; and
 - Maintenance Program.

All of these programs have been recently updated and revised and CNSC staff noted improvements in the overall approach towards these operations.

63. The Commission asked about the drilling method and status of works at Shaft No. 2. Cameco responded that the main purpose of the Shaft No. 2 is to provide ventilation for the entire underground development, as well as to serve as a secondary ingress to the mining and development. Cameco added that it uses conventional drilling and blasting techniques, and that its mining contractor provides the support in execution and planning for both shafts.

Fire Protection

64. Cameco informed the Commission that it had revised its Fire Protection Program based on site-specific activities and risks, and separated it from its Emergency Preparedness and Response Program. Detailed response and evacuation plans exist for all personnel and the highly trained emergency response personnel on site. These plans are practised through drills and exercises and are revised as required on an ongoing basis. CNSC staff confirmed that the Cigar Lake Project's Fire Protection Program is a standalone document, and that it was undergoing final CNSC staff review. As with other mines, CNSC staff is recommending new requirements for monitoring the Fire Protection Program, outlined in the Appendix E attached to the licence.

65. Cameco added that fire protection for Cigar Lake includes fire safety plans and systems for maintenance, inspection and testing of the fire systems in all buildings on site. The maintenance staff is trained and systems are established to assure compliance with *National Fire Code* provisions for maintenance, testing and inspections. The staff training and implementation of the systems were completed in 2008.
66. CNSC staff reported that the Cigar Lake Project has extensive fire detection and suppression systems in place, and has a trained and equipped fire fighting and emergency response team. CNSC staff added that Cameco conducts regular drills of the emergency response plans to reduce risks from fires.
67. CNSC staff further informed the Commission that Third Party Review reports were submitted by the licensee to satisfy licence condition 4 of Appendix E. CNSC staff noted that the licensee has provided a corrective action plan with target completion dates to resolve the majority of the identified issues. It also noted that required procedures and processes have been developed, and training was underway to support their implementation.

Conclusion on Operational Performance

68. Based on the above information and considerations, the Commission is satisfied that Cameco has sufficient controls in place so that the proposed activities continued operation of the facility will not adversely affect health and safety of persons or the environment.

Performance Assurance

69. Cameco informed the Commission that it has developed programs to support the management of the Cigar Lake Project. These programs form the Cigar Lake quality management system (QMS), the elements of which are incorporated into the management programs for governing site activities. CNSC staff rated the programs and their implementation as meeting requirements.

Quality Management

70. With respect to operational quality management, Cameco provided further details of its site-specific Quality Management Program based on Cameco's corporate system, which has been implemented to provide a systematic framework to align and integrate other management processes. Cameco added that increased documentation requirements for site activities represent a significant improvement to the Cigar Lake QMS. To facilitate the implementation of the documents, Cameco has improved accessibility through the development of a database and search tools, and through the development of training programs.

71. Cameco stated that, among other activities, it was focusing on corrective actions; in 2007, it had initiated a corrective action protocol that had addressed the issues and commitments arising from the root cause analysis of the 2006 inflow events. Under this program, more than 150 activities or commitments were undertaken so far. Cameco further stated that all corrective actions required for Phases 2 and 3 of the mine remediation project have been completed and verified, and that another 29 activities, some of which were completed, were required for Phase 4. The remaining activities cannot be fully addressed before underground areas are assessed. Cameco added that all corrective actions related to Shaft No. 2 were complete and verified.
72. Cameco further stated that the implementation and verification of corrective actions led to revision and development of new management programs and procedures at Cigar Lake to assure diligence in the planning, assessment and execution of all activities.
73. With respect to governance, Cameco indicated that the organizational structure changes made in 2007 had enhanced corporate governance and oversight across Cameco's Saskatchewan mining operations and in particular at the Cigar Lake Project, which is currently under the single accountability of the site general manager who reports to the Major Projects Division. The major projects division is responsible for bringing Cigar Lake into production.
74. Cameco pointed out that Cigar Lake's management structure will evolve as the site moves towards production with construction management functions being replaced by operations management functions, and that revisions to be made would be communicated to the CNSC.
75. The Commission sought more information on differences in safety culture at different Cameco sites. Cameco informed the Commission about its efforts to institute quality management throughout the organisation since 2003, and stated that it had learned from the events, predominantly in 2006 and 2007, that establishing a solid safety culture at every one of its sites is a critical point in implementing a comprehensive quality management system. This process is still going on, so that differences from site to site reflect different levels in accepting this new corporate approach to building up safety culture.
76. CNSC staff confirmed a noticeable evolution in Cameco's approach to safety culture and implementation of corporate-wide programs, and progress made at the Cigar Lake site.

Training

77. Cameco informed the Commission that the documentation specifying the requirements of the training programs compliant with systematic approach to training (SAT) is now in place, and that Cameco had created a database to track and analyze the status and progress of training activities across the company. Cameco noted that the Cigar Lake Training and Development Program has been rewritten to incorporate and document the SAT process.

78. Cameco stated that job-specific training was being developed following a task analysis of each position at Cigar Lake, and that the process is expected to be complete by the end of 2011.
79. CNSC staff stated that it was satisfied with a risk-based approach to Cameco's training program, which is currently being implemented, and noted that training in a variety of areas has been a significant part of the Cigar Lake Project since the mine flooding incidents. CNSC staff added that the developed training modules aim at providing all mine site staff with a better understanding and appreciation of the geology, hydrogeology and risks associated with mining at Cigar Lake. CNSC staff cited the development of "Water Inflow Prevention and Awareness" as a good example of SAT program application made in response to the TapRoot® corrective action recommendations.
80. CNSC staff rated the program as meeting requirements; however, CNSC staff is of the opinion that the SAT program implementation will take considerable time and resources, so it has assigned a rating of below requirements for the implementation of the Training Program.
81. The Commission asked what was the basis for evaluating Cameco's training program, since the full implementation of the SAT program will not be completed before 2011. CNSC staff responded that the basis for evaluation was the roll-out of the new program and the SAT program.
82. Based on the above information and considerations, the Commission is of the opinion that the outstanding issues in program implementation pose a low risk to the achievement of regulatory performance requirements and expectations and concludes that Cameco has in place the necessary programs to assure continued acceptable performance.

Emergency Preparedness

83. With respect to Emergency Preparedness, CNSC staff informed the Commission that Cameco has a Site Crisis Management Team that operates from a Command Centre at the Cigar Lake site. It is composed of a command centre group of management and reference personnel and a field group that includes a Mine Rescue Team and an Emergency Rescue Team. These two teams of the field group have been formed from a mixture of management, staff and long-term contractors to respond to surface and underground emergencies. The training of the teams is based on existing provincial and nationally recognized training programs. Cameco's corporate crisis management team, located at Saskatoon headquarters, provides assistance to the Site Crisis Management Team.

84. CNSC staff further informed the Commission that Cameco had submitted its revised and updated Cigar Lake Emergency Preparedness and Response Program. Core elements of this program include emergency response, mine rescue, mine evacuation, first aid, fire-fighting and protection, and spill response. Testing of the components of the Emergency Preparedness and Response Program is carried out in accordance with *The Saskatchewan Mines Regulations, The Occupational and Health and Safety Regulations, Environmental Emergency Regulations and Metal Mining Effluent Regulations*.
85. CNSC staff reported that the program and its implementation have been rated as meeting requirements.
86. Based on this information, the Commission is satisfied that Cameco is making adequate provision in the area of emergency preparedness.

Nuclear Security

87. With respect to site physical security issues, the Commission was provided with separate, protected CMD 09-H12.A for its consideration.

Safeguards

88. CNSC staff informed the Commission that the licensee has in place a satisfactory procedure to facilitate the prompt access of the International Atomic Energy Agency (IAEA) inspectors upon request. During this review period, no access requests from the IAEA were received.
89. Based on the information received, the Commission is satisfied that Cameco has made adequate provisions in the areas of safeguards and measures necessary for implementing international agreements to which Canada has agreed.

Decommissioning Plan and Financial Guarantee

90. Cameco informed the Commission that the current approved decommissioning plan include all construction activities to the end of Phase 5, and the cost estimate amounts to \$27.7 million. This amount is secured with irrevocable letters of credit issued to the Saskatchewan Environment in the event of insolvency of Cigar Lake's owners prior to decommissioning.
91. CNSC staff informed the Commission that the financial guarantee amount has been provided through irrevocable letters of credit by the Cigar Lake Project joint venture owners in amounts based on percentage ownership.

92. The Commission sought more information on periodic reviews of the decommissioning plan and asked whether the estimation of \$27.7 million projects was made for the full, four-year licence period. CNSC staff responded that the estimate was based on the underground workings that would occur during the proposed licence period, including the existing infrastructure. CNSC staff added that reassessments of financial guarantees are usually done every five years, and that the current financial guarantee was approved by a Panel of the Commission on February 25, 2009.
93. The Commission is of the opinion that the revised decommissioning plan and financial guarantee, as proposed, are acceptable. The Commission notes that any changes to the decommissioning cost estimate shall be brought forward to the Commission for consideration.

Public Information

94. Cameco informed the Commission that it follows its Public Information Program to provide information about site activities and to consult with people in communities surrounding its operations, on a regular basis. Consultation occurs formally through Cameco and other government-sponsored committees, as well as informally through site tours, community visits and general public information sessions that include the Northern Saskatchewan Environment Quality Committee (NSEQC), the Northern Mines Monitoring Secretariat (NMMS), the Mudjatik Co-Management Board, and the Northern Labour Market Committee.
95. Cameco provided more details on the information it disseminates to its target audience and listed meetings with the members of the Athabasca Working Group and Athabasca Environmental Quality Committee. Cameco added that the representatives of the Cigar Lake Project visited the Athabasca communities of Uranium City, Fond du Lac, Stony Rapids and Wollaston as part of the Northern Energy Tour.
96. Cameco reported that interest in the Cigar Lake Project is high in the remote communities of the Athabasca Basin, primarily as a source of high-quality employment and business opportunities for northern people.
97. CNSC staff stated that Cameco's Public Information Program is assessed against criteria set out in Regulatory Guide G-217, *Licensee Public Information Programs*⁵, and that the program is also evaluated by third party surveys. CNSC staff added that officials of the CNSC and Saskatchewan Environment have been directly engaged alongside Cameco and community members in facilitating site tours, environmental monitoring and the development of site remediation and mitigation options.

⁵ Published by CNSC in January 2004, ISBN 0-662-35875-9

98. With respect to Aboriginal consultation, CNSC staff reported that the Cigar Lake mine is within the boundaries of Treaty Ten, signed in 1906 with the ancestors of present-day First Nations. Additionally, the Athabasca Denesuline claimed an area that includes the area where Cigar Lake is located as their traditional territory; they identified their traditional use of Waterbury Lake and surroundings. Consultations will take place with the Athabasca Denesuline in the environmental assessment process to better understand whether the Cigar Lake Water Inflow Management Project (separate and independent from Cigar Lake Renewal Project) will adversely affect the aquatic ecosystems of Aline Creek and Seru Bay. CNSC staff stated that no changes to licence renewal for Cigar Lake Project are expected.
99. The Métis Nation - Saskatchewan (MN-S) has also provided comments for the environmental assessment process for the Cigar Lake Water Inflow Management Project. CNSC staff stated that there are no MN-S locals in proximity to the Cigar Lake mine.
100. The Commission is satisfied that Cameco has in place a developed public information program and expresses the view that the program should continue to provide meaningful information in a clear and understandable manner to the public.

Cost Recovery

101. CNSC staff reported to the Commission that Cameco Corporation is in good standing with the Canadian Nuclear Safety Commission's *Cost Recovery Fees Regulations*⁶, with respect to the payment of licensing fees for its Cigar Lake Project.

Application of the *Canadian Environmental Assessment Act*

102. Before making a decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act*⁷ (CEAA) have been fulfilled.
103. CNSC staff stated that Cameco's proposed remediation activities are related to accidents and events considered by the Commission in the original proposal to construct and operate the Cigar Lake Project. The Commission had concluded that the Screening Report for the original proposal was complete and met the requirements of the CEAA, and that the project, taking into account the appropriate mitigation measures identified in the Screening Report, was not likely to cause significant adverse environmental effects.

⁶ Statutory Orders and Regulations, S.O.R./2003-212.

⁷ Statutes of Canada, S.C. 1992, c. 37.

104. Based upon the above assessment, the Commission is satisfied that an environmental assessment is not required before the Commission may consider and make a decision on this licence renewal application for the Cigar Lake Project under the NSCA.

Licence Length and Interim Reporting

105. Cameco requested and CNSC staff recommended a licence term of four years beginning January 1, 2010 and ending December 31, 2013. The CNSC staff's recommendation is based on the criteria provided within CMD 02-M12 *New Staff Approach to Recommending Licence Periods*.
106. The Commission inquired on reporting and requested that CNSC staff present an interim report. CNSC staff noted that Cameco should submit the revised Mine Plan, to be approved by the Commission or by a person authorized by the Commission, before it proceeds to Phase 5 activities, and that an interim report could be prepared at that time.
107. Based on the above information and considerations, the Commission accepts the proposed four-year licence term. With respect to interim reporting, the Commission requests that Cameco and CNSC staff present to the Commission an interim report on progress of remediation and the safety performance at the Cigar Lake Project at a public proceeding of the Commission, at the time of an approval for Phase 5 activities, in approximately May 2011.

Conclusion

108. The Commission has considered the information and submissions received from Cameco, CNSC staff and intervenors as presented in the material on the record.
109. The Commission concludes that an environmental assessment under the CEAA is not required before the Commission may make its decision with respect to the application for the renewal of the licence.
110. The Commission is satisfied that the applicant meets the requirements of subsection 24 (4) of the NSCA. The Commission is of the opinion that Cameco is qualified to carry on the activities that will be permitted under the licence. The Commission is also of the opinion that in carrying on those activities, Cameco will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

111. The Commission therefore renews, pursuant to section 24 of the NSCA, Cameco's Cigar Lake Project Uranium Mine Construction Licence, for a period of four years. The Commission includes in the licence the conditions recommended by CNSC staff, as set out in the draft licence attached to CMD 09-H12. However, the Commission modifies Appendix D of the licence regarding action levels to show clear distinction between required regulatory limits and reportable values that would include interim action levels.

112. The Commission requests that Cameco and CNSC staff prepare an interim report that will provide a summary of the remediation activities and safety performance of the Cigar Lake Project. The reports shall be presented at the proceedings of the Commission in approximately May 2011.



Michael Binder
President
Canadian Nuclear Safety Commission

DEC 23 2009

Date

Appendix A – Intervenors

Intervenors	Document Number
Northern Saskatchewan Environmental Quality Committee, represented by F. McDonald	CMD 09-H12.2
English River First Nation of Patuanak, Saskatchewan	CMD 09-H12.3 CMD 09-H12.3A