

Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant Cameco Corporation

Subject Application to Renew the Class IB Nuclear Fuel
Facility Operating Licence for the Conversion
Facility Located in Port Hope, Ontario

Hearing
Dates October 4 and November 28 and 29, 2006

CNSC staff			Document Number
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Intervenors			Document Number
See appendix A			
Others			
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Licence: Renewed
Date of Decision: November 29, 2006

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Introduction

1. Cameco Corporation (Cameco) has applied to the Canadian Nuclear Safety Commission (CNSC¹) for the renewal of the Class IB Nuclear Fuel Facility Operating Licence for its Conversion Facility in Port Hope, Ontario. The current operating licence FFOL-3631.1/2007 expires on February 28, 2007. Cameco has applied for the renewal of this licence for a period of five years.
2. The Port Hope Conversion Facility (hereafter called the ‘facility’) is located within the Municipality of Port Hope, Ontario, situated on the north shore of Lake Ontario, approximately 100 km east of the city of Toronto, Ontario. The facility primarily converts uranium trioxide (UO₃) powder produced by Cameco’s Blind River Facility to uranium dioxide (UO₂), which is used in the manufacture of CANDU reactor fuel, and uranium hexafluoride (UF₆), which is exported for further processing into fuel for Light Water Reactors. In addition, a Metals Plant is used to cast uranium metal into shielding and counterweights for certain types of aircraft. The facility also includes recycling and decontamination capabilities along with a stand-by plant for further UO₂ production.
3. The facility comprises two sites. Site 1 consists of two areas situated between the railway viaducts and Lake Ontario, to the south of the main commercial and residential areas of the town. The first area borders the harbour and slip on the west side. The second area, the Centre Pier property, lies between the east side of the harbour and slip and the Ganaraska River. It has buildings used for storage of contaminated solid waste materials as well as an outside temporary storage facility for contaminated soils excavated from the recently built municipal water treatment plant located to the west of Site 1.
4. Site 2 is located on Dorset St. East, a predominantly commercial/ industrial area in the east part of the town. There are two buildings on this site in which contaminated solid waste materials are stored.

Issue

5. In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*²:
 - a) if Cameco is qualified to carry on the activity that the licence would authorize;
and

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 S.C. 1997, c. 9.

- 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.

Public Hearing

6. The Commission, in making its decision, considered information presented for a public hearing held on October 4, 2006 in Ottawa, Ontario and November 28 and 29, 2006 in Port Hope, Ontario. 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 06-H18, CMD 06-H18.A and CMD 06-H18.B) and Cameco (CMD 06-H18.1 and CMD 06-H18.1A). The Commission also considered oral and written submissions from 164 intervenors (see Appendix A for a detailed list of interventions).
7. The Commission also held a public hearing on Zircotec Precision Industries Inc.'s application to renew its operating licence for its facility also located in the Municipality of Port Hope. Because the two facilities are located in the same geographic area, and recognizing the interest many of the intervenors have in both facilities, the Commission considered for both hearings any relevant information presented on either hearing record.

Decision

8. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Proceedings*,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, issues a Nuclear Fuel Facility Operating Licence to Cameco Corporation, Saskatoon, Saskatchewan, for the Port Hope Conversion Facility. The licence, FFOL-3631.0/2012, is valid from March 1, 2007 to February 29, 2012, unless suspended, amended, revoked or replaced.

9. The Commission includes in the licence the conditions as recommended by CNSC staff in CMD 06-H18.C.
10. The Commission requests that CNSC staff prepare a status report following the mid-point of the five-year term of the licence. CNSC staff's status report shall be presented at a public proceeding of the Commission (in approximately October 2009) and will provide a summary of the performance of the licensee and facility.

³ S.O.R./2000-211.

11. The findings of the Commission presented below are based on the Commission's consideration of all of the information and submissions available for reference on the record for the hearing. The Commission notes that several intervenors' concerns were discussed in detail during the course of the hearing, and that this information can be found in the transcripts of the proceedings.

Issues and Commission Findings

Radiation Protection

12. Cameco stated that it has a well-structured radiation protection program to ensure that the potential exposure of employees, the public and the environment to radiation from its operation is kept ALARA (As Low As Reasonably Achievable). Cameco stated that doses to employees, the public and the environment during the licence period have been maintained at levels that represent a fraction of the regulatory limits.
13. CNSC staff reported that its compliance verification activities included routine on-site inspections and a review of information submitted by Cameco, including quarterly and annual compliance reports. CNSC staff stated that Cameco's performance in controlling airborne uranium in the workplace, minimizing radiation doses to workers, and controlling releases of uranium to the environment was also reviewed during the licence period. CNSC staff noted several minor items relating to radiation protection during routine inspections, which were addressed to CNSC staff's satisfaction.
14. CNSC staff reported that in March 2003, it conducted an inspection to evaluate Cameco's implementation of the radiation protection program. CNSC staff stated that the inspection identified improvements to the program, as well as some deficiencies. CNSC staff reported that although deficiencies were identified, Cameco satisfactorily completed corrective actions to address them. CNSC staff noted that the nature of the deficiencies did not pose an unreasonable risk to the health and safety of persons or the environment.
15. CNSC staff reported that Cameco completed several projects to reduce dose to workers and the public, including a concrete shield wall installed in the warehouse that resulted in a 60% reduction in the gamma dose rate at a fence line gamma monitoring station.
16. The Commission sought further information concerning the concrete shield wall. Cameco replied that the wall's special footing was engineered to support and stabilize it, and ensure that it can take the load. Cameco explained that a civil engineer consultant evaluated the construction of the wall against federal and provincial building codes and concluded the wall would safely meet the applicable code to a height of five blocks. Since the wall is six blocks in height, Cameco said that it will anchor the bottom row of blocks to ensure the wall meets the Code requirements for the seismic activity zone applicable to the area.

17. CNSC staff stated that it examined the wall as part of its routine inspections and did not identify any concerns with occupational health and safety risks.
18. CNSC staff reported that Cameco's radiation protection program and implementation meets regulatory requirements. CNSC staff explained that the changes made to the program during the licence period have improved the program's ability to ensure that radiation exposures and doses are ALARA.

Protection of Workers from Radiation

19. For a Nuclear Energy Worker (NEW), the regulatory limit for effective dose is 50 milliSieverts per year (mSv/y) and 100 mSv per five years and for skin dose the limit is 500 mSv/y. Cameco reported that the results of its dosimetry, urinalysis and lung counting programs were substantially below the license limits over the licence period 2002-2006.
20. CNSC staff reported that its review of worker dose data for the licence period indicated that radiation doses are being adequately controlled at the facility. CNSC staff found that no NEW at the facility received an effective dose in excess of the regulatory limits, as defined in the *Radiation Protection Regulations*⁴ (2001).
21. The Commission asked for an overview of how employee dose is monitored. CNSC staff responded that the workers' doses are based on urinalysis (urine dose), lung counting (lung dose), and dosimeters, which give the workers' whole body dose from gamma and beta radiation and shallow dose (skin dose).
22. Cameco reported that it made several improvements to its radiation protection program over the licence period, including an internal dosimetry program, which was developed and tested by Cameco and Health Canada, and reviewed and accepted by the CNSC's Internal Dosimetry working group. Cameco noted that the internal dose component of a worker's total effective dose is comprised of the individual dose derived from urinalysis and the group average dose from lung counting.
23. Cameco reported that for various radiological and environmental parameters, it, with CNSC staff concurrence, has set action levels. Action levels serve as an early warning of a condition that warrants further investigation. Cameco also noted that it has established internal administrative levels, which are set lower than action levels and thereby provide an even earlier warning of a potential problem or issue. Cameco stated that it investigates results above internal administrative limits.
24. Cameco reported that during the licence period two action level exceedances were reported to the CNSC. Cameco stated that both instances were due to elevated whole body dose as measured by Thermo Luminescent Diode (TLD) badges and in both

⁴ S.O.R./2000-203.

instances, no conclusive cause could be identified. Cameco explained that both individuals felt that the cause was an error in the analyses of their TLD badges because their performance during the month in question was typical and nothing could account for the increased dose.

25. CNSC staff concurred with Cameco's findings and noted that the whole body doses for all other workers in the same work areas were below the action level during the same period of time. CNSC staff stated that its review of these incidents indicated that these two elevated readings did not represent an overall adverse trend that would signify a potential loss of control of Cameco's radiation protection program.
26. Cameco also reported one significant radiological investigation during the licence period, which was related to an employee who inhaled UO₂ powder while conducting maintenance on a drumming station. Cameco stated that an incident report was sent to the CNSC in November 2002. Cameco stated that its investigation into this incident revealed that maintenance work procedures were not consistently administered for work on the UO₂ drumming station. Cameco stated that corrective actions were identified and implemented in order to ensure a similar incident does not occur in the future.
27. Intervenors expressed concern about the dose received by the workers. The Commission asked Cameco to comment on the NEW exposure compared to the public. Cameco responded that it is expected and acknowledged that a worker in a facility will be exposed to a higher level of contaminant, which is reflected in the limits (the public dose limit prescribed in the *Radiation Protection Regulations* is 1 mSv/y). CNSC staff noted that no workers are exceeding dose limits.
28. An intervenor noted that, as a licensed physician and a consultant for Cameco, he conducts regular medical examinations onsite at the Cameco facility. He expressed the view that Cameco is a leader in health and safety based on the high quality of its medical surveillance program, its focus on medical and general health education, and the continuous support for its emergency medical and emergency response team. He stated that the workers participate in either an annual or a biannual medical examination, which can include extensive blood work, electrocardiographs, pulmonary function tests, hearing tests, vision tests, ultrasound measurements and chest x-rays. He also submitted that workers have not expressed major concerns regarding the workplace.
29. Other intervenors, including Cameco employees and union representatives expressed support for Cameco's operations, citing workplace health and safety as being positive.

Protection of the Public from Radiation

30. CNSC staff reported that the potential sources for radiation doses to the public from the facility are from intakes of uranium in air and water, and exposure to gamma radiation.

CNSC staff stated that these sources are controlled and their performance is monitored in accordance with the programs for environmental and radiation protection. CNSC staff explained that, using environmental monitoring results, the public dose rate is determined for a hypothetical member of the public (critical receptor) living near the facility who would receive the maximum exposure.

31. CNSC staff reported the estimated annual effective dose received by the critical receptor for each year during the licence period. CNSC staff noted that the results have shown a decreasing trend since 2001, from a maximum of 0.069 mSv/y in 2002 to 0.023 mSv/y in 2005.
32. Many intervenors were concerned with the radiation emitted from the facility and the potential exposure to the public. The Commission sought further information from CNSC staff in this regard. CNSC staff explained that the risk of potential health effects at very low doses (doses that are in the range of tenths of milliSieverts and lower) is very low. CNSC staff stated that licensees are required to ensure that doses are ALARA because even though CNSC staff believes that the most likely health outcome is no negative health effect, there is some uncertainty about risks at very low levels.
33. As a point of comparison, the Commission asked CNSC staff to explain background radiation and sources. CNSC staff responded that typically in Canada, doses to the public from natural background that comes from naturally occurring radioactive substances are in the range of 2 to 3 mSv/y. CNSC staff explained that natural sources of radiation include the sun, cosmic rays and radon, which naturally occurs in soil. CNSC staff stated that the dose from the facility is conservatively estimated at being one per cent above the estimated natural background radiation, although the actual dose to an actual member of the public is likely much smaller.
34. In response to intervenors' concerns and at the request of the Commission who sought further information regarding health effects of radiation exposure on this community, CNSC staff provided details of the cancer incidents and the cancer mortality reports conducted by Health Canada with the participation of national disease surveillance experts. CNSC staff reported that the Cancer and General Mortality Report, covering the period between 1956 and 1997, indicates that congenital abnormalities in the community of Port Hope were less than what would normally be expected in a similar town in Ontario. CNSC staff noted that childhood cancers within Port Hope were well within the range of what would normally be expected. CNSC staff further noted that there was no overall higher rate of cancer in the community but there was a higher rate of cardiovascular disease.
35. Intervenors raised concerns about the potential exposure to radiation for truck drivers and the public due to the transport of UF₆ cylinders. The Commission sought further information on this matter. CNSC staff responded that there is no elevated risk. CNSC staff explained that potential public exposure is taken into account when developing the CNSC's transportation regulations, which are based on the International Atomic Energy Agency (IAEA) regulations. CNSC staff stated that licensees must monitor the

dose in the area where the driver and any passengers are sitting in order to ensure that they are not overexposed.

36. Cameco added that the transport of radioactive material is an important aspect of the nuclear industry and is well regulated. Cameco explained that the design of a package and the allowable radiation from a package are such that a package can be in public and meet all public exposure requirements. Cameco explained that all cylinders are monitored for alpha and gamma radiation before they are released from the site and they must meet release criteria before they are released. Cameco stated that these packages are safe in transit for any member of the public anywhere.
37. Many intervenors expressed concerns about the location of the facility and the lack of a “buffer zone” between the facility and the community. Some intervenors suggested that the facility relocate to a more remote location within the Port Hope region. These intervenors also expressed the need for the facility to be held to a standard of zero emissions.
38. In this respect, the Commission was informed that the lack of a physical buffer zone is offset by the defence in depth (independent, redundant safety systems) that is employed at the facility, as described elsewhere in this *Record of Proceedings*, to ensure that emissions are sufficiently low and that hazardous materials are contained. The Commission also notes that given the strict and continuous regulatory monitoring of emissions from the facility, as well as the continuing measures taken to reduce emissions ALARA, the facility does not pose an unreasonable risk to the health and safety of persons or the environment in its present location.

Neutron Radiation

39. The Commission questioned the status of the issue of neutron fields emitted from UF₆ produced at the facility, generated by the interaction of alpha particles with fluoride atoms present in UF₆.
40. Cameco reported that the maximum fence line dose rate was found at a location adjacent to UF₆ cylinders, which was expected. Cameco stated that overall, the average neutron dose rate is very low and there is very little public activity in the area where the maximum reading was obtained. Cameco stated that the actual dose to a member of the public from neutron radiation would be a very small fraction of the public dose limit. Cameco indicated that it had modified its fence line radiation monitoring procedure to include annual neutron measurements in order to ensure that the levels remain low. Cameco also stated that it has implemented ongoing neutron monitoring at the facility to ensure levels remain acceptably low and ALARA.
41. CNSC staff stated that it had verified that the neutron radiation levels at the fence line of the facility were sufficiently low. CNSC staff noted that further monitoring was justified in the interest of due diligence and to ensure that the levels remain low. CNSC

staff also noted that it had requested further information on the time which workers would be in the areas where neutron doses have been measured. CNSC staff explained that the values previously determined for worker exposure were based on a conservative over-estimate, and it expects that that a calculation based on the preliminary numbers from additional monitoring would be lower than what was estimated.

42. CNSC staff stated that an inspection of the UF₆ cylinders done by its transportation inspectors found the levels to be low. CNSC staff explained that the dose levels of neutrons are relative to the dose levels of gamma, and gamma levels are the controlling factor when cylinders are monitored. CNSC staff stated that if the gamma fields are sufficiently low, then the neutron fields are a fraction of that.

Conclusion on Radiation Protection

43. The Commission concludes that the operation of the facility during the licence term has not posed an unreasonable radiation risk to workers or the public. The Commission is satisfied that the continued operation of the facility with full implementation of the radiation protection program will not pose an unreasonable radiation risk to health and safety of persons or the environment.
44. With respect to the submissions regarding the need for further health studies, the Commission notes that similar submissions were considered at the mid-term performance hearing held on February 23, 2005. The Commission notes, as it did then, the CNSC's past participation in these types of health studies. The Commission further notes that CNSC staff stated that it is not planning any further general health effects studies, that health is under provincial jurisdiction and that CNSC staff would consider participating in studies initiated by others on a case-by-case basis.

Conventional Health and Safety

45. Cameco reported that safety is a core Cameco value and at the foundation of all of its operational activities. Since the processing of uranium involves work that could affect human health, Cameco stated that it makes every effort to ensure the work is properly controlled. Cameco cited its achievement of the milestone of one year lost time accident-free in April 2006 as evidence of continual improvement at the facility.
46. Cameco reported that it utilizes a corporate-level Safety and Health Management Program (SHMP) that is compliant with Cameco's Corporate Safety and Health Management Program, which provides guidance for day-to-day operations at the site.
47. Cameco stated that the governing *Canada Labour Code*⁵ Part II regulation requires that the PHCF have a Policy Health and Safety Committee (PHSC) and a Workplace Health

⁵ R.S.C. 1985, c. L-2.

and Safety Committee (WHSC). Cameco explained that both committees consist of one-third management, one-third union employees, and one-third staff employees and these committees meet monthly to discuss health and safety issues and serve to monitor the Facility's internal responsibility system for safety.

48. Cameco provided a table of statistics of the number of injuries at the facility. Cameco explained that the apparent increase in safety related incidents at the facility was caused by the cancellation of the traditional one-month summer shutdown, increased production and an increasing number of employees at the site. Cameco reported that it is in the process of establishing common leading performance indicators to supplement its traditional injury-based statistics.
49. The Commission asked about the presence of asbestos in the facility. The Commission sought confirmation that appropriate measures were being taken to ensure that worker health and safety was being protected. Cameco responded that it has an asbestos management program that measures and tracks all of its asbestos inventories. Cameco stated that the program is modelled on the rigorous Ontario Occupational Health and Safety Act. Cameco noted that asbestos will be removed from buildings over the course of decommissioning. CNSC staff responded that it understands that Cameco is in compliance with the requirements under the *Canada Labour Code* for conventional health and safety and there are no significant issues in that regard, including the management of asbestos.
50. The Commission sought confirmation that Cameco is providing adequate training to all the workers at the plant so that they can operate in a safe manner and embrace a positive safety culture. Cameco reported that it employs a systematic approach to training (SAT), safety orientation and appropriate training for new employees and their work assignments, and maintains training in a variety of ways, including monthly safety meetings that feature discussion of safety concerns such as ergonomics, radiation protection, environmental awareness and office safety.
51. Intervenors expressed concern over the use of hydrofluoric acid (HF) at the facility and the risk to health and safety. In this regard, the Commission sought information concerning the safety with which fluorides are handled at the facility. CNSC staff noted that sufficient barriers have been implemented and are continuously reviewed to ensure that enough defence in depth is properly placed on this safety area.
52. CNSC staff further explained that all handling of HF is done within the confines of the facility in the plant. CNSC staff noted that railcars carrying HF are off-loaded inside the facility where the defence in depth mechanisms can be properly used to ensure the safety of workers, the public and the environment. CNSC staff stated that it has benchmarked this type of process of dealing with HF in the uranium conversion process against other similar facilities. CNSC staff noted that the measures that Cameco has taken to ensure that the public, workers and the environment are protected exceed those that are used at comparable facilities.

53. The Commission further inquired if any incidents at the plant involving fluorides occurred during the licence period. CNSC staff responded that several incidents occurred related to releases within the containment system within the plant facility, and first-aid had been administered to individuals as a result of some incidents. CNSC staff noted that each incident is analyzed by Cameco to determine the root causes and any corrective actions and measures that need to be taken to prevent the incident from reoccurring.
54. The Commission asked Cameco to explain how it would eliminate incidents involving contact with HF. Cameco stated that its goal is to have no incidents with HF and reiterated that it maintains rigorous systems for putting in place work practices that will achieve a workplace with no contact with HF.
55. The Commission is satisfied that the operation of the facility during the licence period has not posed an unreasonable risk to the health and safety of workers or the public. The Commission is satisfied that, with the implementation of the Safety and Health Management Program, the continued operation of the facility will not pose an unreasonable risk to the health and safety of persons.

Environmental Protection

56. Pursuant to the NSCA and its related regulations, Cameco is required to make adequate provisions to protect the environment. This includes identifying and controlling the releases of nuclear substances and hazardous substances to the environment, ensuring that adequate measures are in place to prevent or mitigate the effects of accidental releases, and implementing effluent and environmental monitoring programs.
57. Cameco stated that its environmental management program (EMP) is registered to the ISO 14001⁶ standard. Cameco noted that the monitoring plan is an important component of the overall EMP and that the data collected by Cameco through the EMP demonstrates that emissions to the environment have remained under control during the licence period.
58. Cameco stated that the primary emissions associated with the operation of the facility are uranium and fluorides. Cameco stated that contamination and other hazards are controlled at the source by the design and operation of process systems and material handling equipment, by restricting the presence of uranium or uranium contaminated wastes to controlled areas, by monitoring the levels of airborne uranium and surface contamination and by effective dust collection and scrubber systems.
59. CNSC staff reported that during the licence period, Cameco continued to maintain a comprehensive environmental protection program to comply with all applicable federal and provincial regulatory requirements.

⁶ *International Organization for Standardization, Environmental Management - The ISO 14000 Family of International Standards.*

60. CNSC staff stated that the potential sources for the release of uranium from the facility are through air, water and solid waste. CNSC staff noted that these sources are controlled and their performance is monitored in accordance with the programs for environmental and radiation protection.
61. Cameco reported that it had reduced fluoride emissions from 138 grams of HF per hour (g HF/h) in 2002 to 52 g HF/h in 2006, representing about a 60% decrease. Cameco stated that it accomplished this through additional process modifications to the scrubbing and fluoride recovery systems in the Facility's UF₆ plant.
62. CNSC staff reported that the environmental protection program met expectations during the licence period.

Effluent Monitoring

Air Emissions

63. Cameco reported that it monitors uranium and fluorides released from stacks from the facility. CNSC staff reported that the results from air emissions monitoring at the facility demonstrate that average uranium and fluoride air emissions from the facility are well below their respective licence limits. CNSC staff noted that no licence limits were exceeded during the review period.
64. CNSC staff stated that contaminants such as ammonia and nitrogen oxides are also monitored and these emissions were also well below the limits. CNSC staff reported that all major stacks in the UO₂ Plant and the UF₆ Plant were sampled during the licence period by a Cameco consultant in order to verify emissions using the reference methods described in the Ontario Ministry of the Environment (MOE) stack sampling code. CNSC staff stated that the consultant's sampling confirmed that there was a reasonable agreement with the results achieved through stack monitoring performed by Cameco.
65. Many intervenors expressed concerns with the increase in reported values for uranium emissions. The Commission sought further information concerning this matter. Cameco stated that the higher reported values are largely due to the change in the calculation of fugitive emissions and that the reported increase is not an actual increase in uranium emissions but a better accounting of emissions than was reported in the past. Cameco noted that from 2000 to 2006, emissions have been less than 10 per cent of the action level of 50 g U/h, which is a fraction of the licence limit.
66. Cameco reported that one of the requirements of the MOE was for Cameco to complete an Emission Summary and Dispersion Modelling (ESDM) report. Cameco stated that the new ESDM report resulted in changes to the calculation of uranium emissions to air for the facility including the calculation of fugitive emissions from the heating,

ventilation and air conditioning system (HVAC) in the UF₆ plant, and of emissions from the incinerator. Cameco stated that testing revealed that the flow rates from the HVAC system were higher than those estimated in the original emission inventory report, primarily due to additional ducts that were identified as uranium emission sources in the ESDM report.

67. Cameco explained that although the improvements to the method for calculating fugitive emissions resulted in an increase to the reported fugitive emissions, the overall uranium emissions from the UF₆ main stack have decreased significantly since 1995. Cameco also reported that the uranium emissions from the UO₂ plant have decreased over the licence period. Cameco explained that the success of its efforts to reduce the main stack emissions coupled with the recent refinements to the calculation of its air emissions resulted in a situation where the fugitive uranium emissions are more significant than the stack uranium emissions. Cameco stated that its future efforts to reduce uranium emissions from the facility will focus on fugitive uranium emissions.
68. Cameco stated that due to the increase in estimated uranium emission rates resulting from these refinements to the calculations, the annual dose to the critical receptor for the years 2002, 2003 and 2004 was recalculated. Cameco reported that the recalculation resulted in an increase to the dose to the critical receptor of 0.001 mSv/y for each of the three years.
69. CNSC staff reported that it is satisfied with the reason for the increased rates. CNSC staff noted that it monitors the rates on an ongoing basis, and they are also reported in quarterly compliance reports. CNSC staff stated that it conducts routine inspections, monitors any adverse trends and reviews Cameco's response to any increase.
70. The Commission asked if CNSC staff was exercising sufficient investigation to ensure that the reported values of total emissions to air are complete. CNSC staff responded that it requires that Cameco do third party verification of stack emissions to verify the numbers it is getting from its own stack emission monitoring. CNSC staff noted that in some cases the MOE conducts a third party independent verification. CNSC staff added that it also does routine monitoring during its routine inspection activities.
71. The Commission inquired about a reported doubling of emissions in May 2005. Cameco responded that in May 2005 the in-plant air concentrations were elevated and therefore, the fugitive emissions were elevated. Cameco explained that some work done to improve the seals on the equipment did not work as well as the manufacturer had claimed. Cameco noted that it took corrective action to resolve the situation and in June the emissions returned to normal. CNSC staff confirmed that this was the case and said that it is satisfied that the situation was resolved in a timely manner.
72. The Commission inquired if Cameco tracks the large volume of uranium going in and out of the facility in order to account for fugitive emissions. Cameco responded that it tracks to less than 0.1% of the total volume. Cameco confirmed that it has captured most of the fugitive emissions.

Water Emissions

73. Cameco reported that there are four types of liquid effluent discharges from the facility: cooling water effluent, process effluent, sewage effluent and storm sewers. Cameco stated that aside from storm water, there are four principal points of direct liquid discharge to the lake: the combined effluent discharge from the operations at the north end of the site, the UO₂ plant, North Metals, and intake water back flush. Cameco stated that the quality and monitoring of each of these discharges is regulated through various government agencies. Cameco reported that the quantity of uranium discharged in the cooling water process effluent is very low, especially relative to air emissions.
74. CNSC staff explained that the North Municipal/Industrial Strategy for Abatement (MISA) and South MISA effluents are monitored for levels of uranium, fluorides, ammonia, nitrates and pH. CNSC staff reported that no licence limits were exceeded during the licence period.
75. The Commission inquired about the increase in nitrates emissions in the first six months of 2006. Cameco responded that the increase in nitrates is a result of the cooling water that has been brought into the facility during the spring, when agriculture fields are fertilized. Cameco noted that it is not uncommon to have a spike in agricultural type nutrients and that this should balance out by the end of the year. CNSC staff reported that this trend has been noted in past historic data and it has been primarily attributed to causes like increased fertilization.
76. Several intervenors expressed concerns about the quality of the water and stressed the importance of keeping it clean and contaminant-free.
77. The Commission inquired about the amount of uranium oxide and radiation in Port Hope's drinking water. Cameco responded that it monitors drinking water on a monthly basis and the results are generally at or below the detection level.
78. The Municipality of Port Hope, as an intervenor, expressed concerns about the oversight from other federal regulators, such as Environment Canada, concerning wastewater and cooling water quality requirements in the proposed licence. CNSC staff responded that the proposed requirements refer to maximum concentrations and pH limits as action levels for process wastewater effluent. CNSC staff noted that for the issue of toxicity testing, it has built on the regulatory framework that exists in the province of Ontario. CNSC staff explained that in this case, toxicity testing has been conducted on effluents at a variety of facilities, both municipal and industrial, under the municipal industrial strategy abatement under the Province of Ontario initiative, and the Cameco facility has participated in this regulatory requirement since its inception in the early 1980s. CNSC staff stated that the commitment to conduct toxicity testing and to be in compliance with the provincial requirement is stated in Cameco's environmental monitoring plan, and CNSC staff has incorporated that as part of the

licence.

Environmental Monitoring

79. CNSC staff stated that Cameco measures uranium in the ambient air around the facility to confirm the effectiveness of emission abatement systems and to monitor the impact of the facility on the environment. CNSC staff reported that the results show that uranium in the suspended particulate has consistently remained very low during the licence period.
80. The Commission asked Cameco to comment on the matter of the current year's ambient air concentrations being twice what they were the previous year. Cameco responded that for the high volume air sampling results, the ambient air uranium concentration levels are so low that small fluctuations in weather, re-suspension of contaminated soils or emissions from the facility have a very pronounced effect. Cameco noted that the ambient air uranium concentration has been significantly reduced and has been in a steady declining trend.
81. CNSC staff stated that Cameco performed an Ecological Risk Assessment (ERA) to assess the environmental effects associated with the use and release of radionuclides and hazardous chemicals at the facility. CNSC staff noted that for the purpose of the ERA, soil concentrations of all contaminants resulting from deposition of the facility's air emissions were modelled using generic soil parameter values.
82. CNSC staff reported that from 2002 to 2004 the CNSC funded a study to obtain site-specific data of uranium accumulation in soil in the Port Hope area due to the releases of uranium from Cameco's facility. CNSC staff reported that soil uranium concentrations, soil properties (including texture, moisture content, bulk density), and the soil solid/liquid partition coefficient (Kd) were determined for several locations in Port Hope, and these site-specific data were applied to the soil model provided in the ERA document. CNSC had concluded that the generic approach used by Cameco was probably not conservative enough and, in 2005, it had requested that Cameco undertake the validation of their soil model predictions.
83. Cameco reported that it initiated a new, long-term soil monitoring program in 2005 to replace the former soil test plot program developed by the MOE. Cameco explained that the program involves taking periodic soil samples from twenty-five locations in the vicinity of the facility. Cameco stated that it collected the first set of soil samples in late 2005 and early 2006.
84. Cameco expanded the Special Soil Study in the ERA and Environmental Effects Monitoring Action Plan to include a comprehensive soil characterization study in order to obtain site-specific soil parameters required to predict soil uranium concentrations and to determine whether or not uranium would accumulate in Port Hope soil to levels that could pose a health or environmental risk in the future. CNSC staff stated that it

reviewed the Cameco's proposed design for the study and found it to be acceptable. CNSC staff reported that preliminary results were received in November 2006.

85. Based on the available information from past soil studies completed in Port Hope and the results received to-date on new soils study initiatives, CNSC staff reported that the levels of uranium and other contaminants in Port Hope soils do not pose an unreasonable risk to the health and safety of persons or the environment, and there is no data indicating any statistically significant accumulation of radioactive and hazardous substances in the environmental samples collected in the Port Hope area due to Cameco operations.
86. Cameco reported that its groundwater monitoring program continues to demonstrate that contamination levels have remained constant over the licence period. Cameco stated that the report concluded that the groundwater monitoring program provides adequate detection capabilities to protect the public and environment.
87. CNSC reported that the values for the licence period were stable and generally consistent with historic values for groundwater monitoring.
88. CNSC staff stated that the impact of fluoride emissions on the environment is determined each autumn when samples of fluoride-sensitive vegetation are collected by the Ontario MOE and Cameco staff from locations close to the facility. CNSC staff reported that the results indicate that there is no significant adverse impact on vegetation at the fluoride emission levels which occurred during the period.
89. CNSC staff reported that through routine inspections and compliance report reviews, CNSC staff is satisfied that Cameco's hazardous waste management program demonstrates an acceptable level of accountability for all such materials generated and managed at the facility.
90. The Commission notes that it expects when waste is removed from the waterfront, it will be conducted in such a manner that will protect the health and safety of the public and the environment.
91. The Commission requests that an independent third party verify Cameco's emissions monitoring methodology and results, and submit its findings to CNSC staff prior to the mid-term report. The Commission has expectations that Cameco will have formulated specific goals for emission levels before the mid-term report is presented.

Flooding

92. During the mid-term performance hearing⁷ held on February 23, 2005, the issue was raised concerning the proximity of the facility to the shore of Lake Ontario and the Ganaraska River and the risk of the property being flooded.
93. CNSC staff stated that at the time of that hearing, the flood lines around the facility were in the process of being remapped by the Ganaraska River Conservation Authority. CNSC staff reported that the flood line study has since been completed and the overall conclusion was that “the Regulatory Flood Plain encroaches into the periphery of the Cameco Corporation property along the Turning Basin and Approach Channel but no spill through the property was identified.”
94. CNSC staff stated that it revised Cameco’s flood proofing report and recommended actions that need to be completed in order to further enhance safety provisions to limit the risks of potential severe flooding events. CNSC staff noted that because there is a very low probability of a severe flooding event and current safety provisions are in place, flooding events are not considered to pose an unreasonable risk to the health and safety of persons or the environment.
95. The Commission asked if climate change resulting in hurricanes larger than Hurricane Hazel has been taken into account for the flood proofing. CNSC staff responded that the flood proofing contained a 15% safety margin beyond the levels from Hurricane Hazel, and noted that the floodplain could be redefined in the future, if necessary. A representative of the Ganaraska River Conservation Authority (GRCA) added that the majority of major river flows occur during the spring and winter, and it is not known how they will be affected by climate change.
96. An intervenor expressed concerns that the floodplain had not been adequately defined and that there were dangers of flooding at the Centre Pier where waste is stored. The Commission sought further information from concerning this matter. CNSC staff responded that when the waste mound was placed at the Centre Pier, the GRCA ensured that the ring well for the mound was above the 100-year high floodplain in the area. CNSC staff stated that this was confirmed by consultants and the GRCA had no further concerns about the design of the mound.
97. The Commission sought assurance that the numerical modelling used to define the floodplain was appropriate. The GRCA responded that both the GRCA and the peer reviewer that was hired to review the modelling were satisfied.

Geotechnical Stability

98. During the mid-term performance hearing held on February 23, 2005, the issue was

⁷ Refer to the Record of Proceedings on *Mid-term Performance Report on the Operation of the Cameco Corporation’s Port Hope Uranium Conversion Facility*, published on May 18, 2005

raised concerning the stability of the harbour wall adjacent to the Cameco site and the potential for any instability presenting a risk to plant structures on-site. CNSC staff stated that Cameco was asked to assess the risk that a failure of the harbour wall could impose in the facility and to report on its findings to CNSC staff.

99. Cameco stated that it prepared a report assessing the impact of a harbour wall failure, the various modes of wall failure and the corrective measures that would be taken. Cameco reported that the overall conclusion is that a harbour wall failure presents minimal risk to site facilities, and the potential risk to human health and the environment for a harbour wall failure is very low. Cameco noted that in all cases the Cameco buildings are situated beyond the possible extent of effects that would be produced by wall failure.
100. Cameco also noted that there is a probability that the pipe rack, which contains water, air, steam, hydrogen, and nitrogen, could be damaged, in which case the flows can be shut off at the source.
101. CNSC staff added that any wall failure would be localized, gradual and detectable by periodic inspection, noting that in the worst case of a complete wall failure, no Cameco building would be affected. CNSC staff stated that a potential harbour wall failure does not pose an unreasonable risk to the health and safety of persons or the environment.

The Alderville First Nation

102. In its oral presentation, the Alderville First Nation (AFN) stated that pollution has damaged the natural resources that it relies upon, such as plants, fish and water.
103. The Commission asked the AFN if any of its members fish in Lake Ontario. The AFN replied that because of the declining fish population in its own territories, it has an alliance with Iroquois Mohawk Nations to fish with them in the Tyendinaga area. The AFN stated that it now fishes in Lake Ontario because of low fish stocks.
104. The Commission asked the AFN to comment on changes in fish quality. The AFN responded that for the last 25 years it has tried not to take any fish from Lake Ontario because the fish were bigger and its people were getting sick from consuming the fish. The AFN stated that it has had to re-educate its people on how to identify healthy and non-healthy fish.

Conclusion on Environmental Protection

105. Based on the above information, the Commission is satisfied that facility operations are effectively controlled with the Environmental Protection Program and mitigation measures in place, and that they do not pose an unreasonable risk to the health and safety of persons or the environment. The Commission is satisfied that the continued

operation of the facility with the safety programs in place will not pose an unreasonable risk to health and safety of persons or the environment.

Operational Compliance and Unplanned Events

106. CNSC staff stated that the routine inspections conducted during the licence period focussed on the following areas: plant modifications, operating procedures, maintenance, in-plant monitoring, effluent monitoring, contamination control, incident reporting and investigation, waste management, site clean-up (CUP) program, and environmental monitoring, including ambient air, water and perimeter gamma monitoring.
107. CNSC staff stated that the items raised during inspections were considered to be minor deviations from requirements or expectations, and have been addressed or are being addressed within a schedule acceptable to CNSC staff.

Significant Events / Incidents

108. Cameco stated that it submitted a Significant Development Report to the CNSC on June 25, 2004 because of an incident involving a UF₆ cylinder leak. Cameco reported that the root cause was identified and corrected to prevent recurrence. Cameco stated that a full report was submitted to the CNSC in May 2005.
109. CNSC staff stated that two other incidents were reported during the licence period: a labour interruption that took place in August and September 2004 and two minor incidents that occurred on March 17, 2005, which were reported to the Commission since they attracted local media attention.
110. CNSC staff reported that Cameco has operated the facility in compliance with the regulatory requirements during the licensing period. CNSC staff reported that Cameco has taken appropriate short term actions to minimize the risks arising from the significant events identified during the licence period. For the two events related to site incidents, CNSC staff stated that the long term action taken to prevent re-occurrence of similar events was also considered acceptable by CNSC staff.
111. CNSC staff stated that the response to other incidents, including remedial actions and long term actions to prevent incident re-occurrence was also considered to be acceptable by CNSC staff. CNSC staff stated that the implementation of a systematic root cause methodology to incident investigation in 2004 was a positive development.
112. Some intervenors expressed concerns over the occurrence of incidents at the facility and the impact they might have on health, safety and the environment. These concerns are discussed in further detail in the appropriate sections of this *Record of Proceedings*.

Conclusion on Operational Compliance and Unplanned Events

113. Based on the above information, the Commission concludes that facility operations are effectively controlled with the safety programs in place and that they do not pose an unreasonable risk to the health and safety of persons, the environment and national security. The Commission is satisfied that the continued operation of the facility with the safety programs in place will not pose unreasonable risk to health and safety of persons or the environment.

Emergency Preparedness and Response

114. Class IB Nuclear Facility licensees are required to have a documented emergency preparedness and response plan based upon credible emergency situations arising from internal and external hazards. Emergency management plans are to be based on credible accident scenarios that could have an adverse impact on the environment and the health and safety of persons, both on-site and offsite.
115. Cameco reported that its emergency management program, which covers response to all types of potential emergencies, including radiation, chemical, fire or security incidents both on-site and off-site, is detailed in the document entitled Emergency Response Plan.
116. CNSC staff stated that the baseline verification of provisions of Cameco's emergency management program is conducted during routine inspections and the review of information reported by Cameco, including quarterly and annual compliance reports. CNSC staff noted that in the latter part of the licensing period, additional oversight beyond the baseline was applied to emergency response because of issues related to the implementation of the emergency program for fires involving hazardous materials.
117. CNSC staff reported that Cameco's emergency management program and implementation meet regulatory requirements. CNSC staff also reported that there was an improving performance trend over the licence period.

Fire and Emergency Response

118. CNSC staff stated that questions arose in October 2004 regarding the adequacy of the implementation of the Emergency Response Plan at the site to address a significant fire involving hazardous materials. CNSC staff reported that Cameco has made acceptable progress in resolving the previously identified inadequacies in fire emergency response capabilities.
119. Cameco reported that it has taken several actions to upgrade its on-site emergency response capabilities, as well as to assist the Port Hope Fire Department (PHFD) in

upgrading its capabilities. Cameco stated that it deploys a minimum number of four Cameco emergency response staff on-site at all times in order to respond to fires and other incidents, and implements a paging system to alert other Cameco emergency response staff who are not on-site when an incident occurs. Cameco stated that its emergency response staff received additional training for responding to on-site fires and new equipment was purchased for addressing a major fire event, including a fire truck, which is available on-site at all times. Cameco added that off-site emergency responders, including volunteer fire fighters from the Port Hope Fire Department, have been provided with site awareness training and advanced hazardous materials training.

120. CNSC staff reported that further action was taken by Cameco in April 2006, including the submission of pre-incident plans to support combined fire response operations. CNSC staff stated that it reviewed these documents and identified some deficiencies. CNSC staff noted that Cameco has been revising the documents to resolve the outstanding issues, which CNSC staff does not consider to pose any unreasonable risk to persons or the environment, and are being addressed in a timely manner.
121. CNSC staff stated that considering Cameco's timely completion of actions regarding the upgrade of its on-site fire response capabilities and on-site verification of the combined emergency response capabilities, CNSC staff is satisfied that the issues surrounding fire emergency response have been adequately resolved. CNSC staff stated that it will continue to verify the implementation of the safety program in accordance with an established compliance program.
122. The Commission asked Cameco about the role of the PHFD. Cameco responded that the PHFD would be utilized for manpower and equipment "as needed," and it would be a last resort for PHFD firefighters to enter Cameco buildings. Cameco added that at the request of the Port Hope Fire Chief, any PHFD firefighters that enter a building must be escorted by the Cameco Emergency Response Team.
123. CNSC staff reported that during the licence period, Cameco conducted a number of emergency exercises in order to maintain its capabilities to respond to events other than fires. CNSC staff stated that this included an exercise to familiarize staff with the newly issued version of the Emergency Response Plan, a test of the Community Alert Network (CAN) system used for notifying the community of emergency situations, and a joint exercise involving a chemical leak from an anhydrous hydrogen fluoride tanker truck conducted in conjunction with members of the local Community Awareness and Emergency Response (CAER) group, including the PHFD and other staff from the Municipality of Port Hope. CNSC staff noted that the exercises were evaluated by Cameco staff and corrective actions were taken to enhance performance.
124. Some intervenors, including members of the public, expressed concerns with the use of HF at the site and the ability for Cameco to respond to an emergency of that type. The Commission asked Cameco to explain its plan for such an incident. Cameco responded that there are systems of secondary containment, alarms and emergency ventilation in place to detect, divert and contain any release of HF. Cameco added that through

involvement with the CAER organization, it has worked towards developing “shelter in place” plans, distributed brochures on shelters in place and implemented the community alert network telephone system, which would provide a means of early warning. Cameco added that the development of evacuation plans is something that needs to be put in place by the municipality, and Cameco is cooperating with the municipality as it evolves and works on evacuation planning and emergency measures.

125. An intervenor stressed the importance of implementing an emergency response plan that involves the municipality, Cameco and Port Hope residents. The Commission asked Cameco to comment on this issue. Cameco responded that it has been very active working through the CAER committee. Cameco explained that the CAER committee is a committee of other industries in the municipality of Port Hope, the emergency services in the municipality, the police and fire services, and Emergency Management Ontario.
126. The Commission asked Cameco when it would address any gaps in the emergency response plan over the proposed licence period. Cameco stated that it expects that the gaps, including further developing the municipal emergency plan for other industries in town and developing joint training exercises will be addressed within the next 18 months.
127. The Commission sought further information on how Cameco would alert the community if an incident occurred that would affect the area outside the immediate vicinity of the plant. Cameco responded that it has put in place the CAN system that would broadcast the information via the telephone system. Cameco stated that it also has arrangements with a radio station to broadcast emergency information on the radio.
128. Cameco stated that it accepts the responsibility to do more with keeping the community informed and aware of its emergency procedures.
129. Based on the above information, the Commission is satisfied that Cameco has made and will continue to make acceptable progress in enhancing the combined on-site and off-site emergency response capabilities available to respond to an emergency at its Port Hope facility. The Commission is also satisfied that Cameco’s emergency response provisions in place will continue to address, to an acceptable level, the risk to the health and safety of persons or the environment. The Commission is satisfied that the continued operation of the facility with the emergency management program in place or to be in place will not pose an unreasonable risk to the health and safety of persons, national security or the environment. The Commission notes the importance for Cameco, along with the Municipality of Port Hope and other organizations, to continue to develop an emergency response system that is effective and understood by the public.

Fire Protection

130. The implementation of a comprehensive fire protection program will reduce the risk to the health and safety of persons and to the environment from fire. CNSC staff stated that it reviewed Cameco's program through fire protection inspections and by the review of Cameco reports. CNSC staff reported that while the aspects of the program related to fire emergency response underwent significant improvements during the licence period, further improvement is required in the following areas:
- operating policies and procedures supporting industrial fire brigade operations;
 - documentation of roles, responsibilities and expectations of on-site and off-site responders, as well as supporting analysis to support the number of responders required; and
 - emergency planning documentation supporting fire emergency response, including pre-incident plans and emergency action plans.
131. CNSC staff reported that the existing fire emergency response provisions do not pose an unreasonable risk to the health and safety of persons or the environment, in consideration of the CNSC mandate and jurisdiction with respect to safety from the nuclear activities as defined by the NSCA.
132. As per conditions in the current licence, Cameco is required to comply with the *National Building Code of Canada* (1995) and the *National Fire Code of Canada* (1995). CNSC staff stated that it performed fire inspections of Cameco's facility in January 2004 for compliance with the *National Fire Code of Canada* (1995). CNSC staff reported that during the inspection, deficiencies were found in the areas of storage of combustible liquids/materials, fire separations and fire doors, ventilation, electrical devices/wiring and fire equipment maintenance. CNSC staff stated that an additional inspection related to code compliance was conducted in August 2005. CNSC staff stated that the inspections indicated that deficiencies related to operational fire safety persist in some areas. CNSC staff noted that the outstanding deficiencies are not considered to pose an unreasonable risk to the health and safety of persons or the environment.
133. CNSC staff also stated that licence conditions require regular third party review to facility modifications with respect to compliance with national fire and building codes, as well as an annual review of compliance with the operational aspects of the *National Fire Code of Canada* (1995). CNSC staff reported that, based on the third party reports submitted during the licence period, these requirements have been met.
134. CNSC staff recommended the requirement to comply with NFPA-801 (2003)⁸ as an additional licence condition.
135. Cameco reported that it prepared and submitted an action plan to complete a formal fire hazard assessment that fully complies with NFPA-801 (2003) in September 2006.

⁸ *National Fire Protection Association, NFPA-801: Standard for Fire Protection for Facilities Handling Radioactive Materials, 2003 edition.*

Cameco requested a transition period to first determine what the new licence conditions will require and then for a phase-in period to achieve compliance of NFPA-801 (2003).

136. CNSC staff reported that it agreed that there be transitional period for the implementation of NFPA-801 (2003) and stated that the licence condition would adhere to the *National Fire Code of Canada* (1995) until February 29, 2008 and the *National Fire Code of Canada* (1995) and NFPA-801 (2003) after February 29, 2008.
137. The Commission asked about the list of outstanding items remaining from the reviews in 2000, 2004 and 2005 and how they would be addressed under NFPA-801 (2003). Cameco responded that as NFPA-801 (2003) is applied, outstanding items would be added to that list. Cameco stated that it expects that all of the outstanding items will be completed in the first half of 2007.
138. Many intervenors expressed concerns that Cameco's fire protection was below requirements over the licence period. These intervenors argued that Cameco's licence should not be renewed for an extended period of time until the outstanding issues of non-compliance are resolved.
139. The Commission sought assurance that the outstanding issues would not pose an unreasonable risk to the public and the environment. Cameco responded that all of the mandatory or high priority items raised in the audits have been addressed. CNSC staff added that Cameco continues to progress on implementing the remaining items to strengthen the fire protection program at the facility.
140. Intervenors also questioned the ability of the PHFD to deal with a major fire in an adequate response time. The Commission sought assurance that Cameco had the resources to deal with a major fire. Cameco responded that it has been committed to having the resources of the PHFD support its team. CNSC staff stated that it has evaluated the combined fire response of the on-site force and the PHFD, and it is satisfied with the actions Cameco has taken to upgrade its on-site response. CNSC staff stated that it is satisfied that the combined force is adequate.
141. The Municipality of Port Hope stated that there have been ongoing discussions with Cameco with respect to a memorandum of understanding for fire training, compensation associated with fire training, and as well as equipment. The Municipality of Port Hope noted that the finalization in the memorandum of understanding will allow it to fully assist Cameco at the Cameco site.
142. The Municipality of Port Hope also questioned why NFPA-801 (2003) will be implemented when NFPA-801 (2008) will soon be available. CNSC staff stated that it will first review the 2008 version to determine if it applies to Cameco. The Commission notes that CNSC staff and Cameco should be in contact with the Municipality (and the Fire Chief) once the 2008 standard is released to discuss the relevancy and applicability of the revised standard.

143. Based on the above information, the Commission is satisfied that facility operations with the fire protection measures in place, and to be in place, will not pose an unreasonable risk to the health and safety of persons or the environment, in consideration of the CNSC mandate and jurisdiction with respect to safety from the nuclear activities as defined by the NSCA. The Commission notes that while an acceptable rate of progress has been made to achieve compliance with licence requirements, additional action is required to achieve full compliance with requirements related to operational fire safety.

Quality Assurance

144. In its written submission, Cameco stated that the quality assurance (QA) program is the foundation of many other site programs, including the ISO 14001 environmental management system. Cameco stated that it continues to evolve to meet regulatory and corporate requirements and expectations.
145. Cameco reported that a CNSC staff audit conducted in 2002 identified a lack of detailed design control documentation. Cameco stated that it addressed the issue by developing additional documentation and providing information in the design control procedure. Cameco stated that these updates were accepted in late 2005 after several revisions.
146. CNSC staff also stated that during the licence period, the facility revised the QA program manual and completed implementation of gaps identified during the review of the CNSC QA requirements issued to the facility in 2001.
147. CNSC staff reported that a Type I inspection was conducted in June, 2006, and no major items of non-compliance were identified. CNSC staff stated that design control was included in the scope of the inspection and substantial improvement to the process was noted.
148. CNSC staff reported that the quality assurance program met expectations during the licence period.
149. Based on the above information the Commission is satisfied that facility operations with the quality assurance measures in place do not pose an unreasonable risk to the health and safety of persons or the environment.

Public Information Program

150. CNSC staff reported that Cameco submitted a public information program (PIP) to the CNSC for staff review in April 2006. CNSC staff stated that it reviewed the program against the expectations set out in CNSC Regulatory Guide G-217⁹ and concluded that

⁹ CNSC Regulatory Guide G-217, *Licensee Public Information Programs*, January 2004

the program was acceptable. However, CNSC staff recommended that the program be enhanced to provide more information on how the licensee's activities will affect the environment and the health and safety of workers and the community.

151. Cameco reported that its public opinion research has shown an increase in public support for Cameco from 66% in January 2005 to 80% in June 2006. Cameco explained that the public response to the proposed production of slightly enriched uranium (SEU) at the facility resulted in Cameco becoming more aware of the need for an improved PIP. Cameco stated that it began developing a new comprehensive PIP, which incorporates regular community dialogue, following the withdrawal of the application to process SEU at the facility.
152. Cameco reported that it established community liaison forums as a means to increase public support and outreach to the community on an ongoing basis. Cameco explained that the community liaison forums are public open meetings where detailed, plain-language briefings are accompanied by a variety of feedback mechanisms, including workshops, questionnaires, and question and answer sessions.
153. Cameco also reported that it launched a new Web site to provide local residents and other interested parties with information about its Port Hope operations. Cameco noted that it mails a newsletter to every mailing address in the Municipality of Port Hope.
154. Cameco stated that it releases a quarterly environmental status report, which outlines the facility's environmental performance, to the Municipality of Port Hope. Cameco also stated that it makes presentations to Port Hope council on specific issues of interest, including fire safety and emergency response. Cameco reported that its other forms of community outreach include community walks, open houses, school programs, trade shows, the fall fair and tour groups.
155. Several intervenors expressed concerns that Cameco's PIP was not providing enough information. The Commission stated that, based on the mid-term review, its expectation was that there would be more community involvement. The Commission noted that its expectations are for information to be disseminated to the community, for there to be engagement with the community, and for the program to be sustainable.
156. Other intervenors stated that Cameco provided an effective public information program.
157. A number of intervenors expressed concern with the amount of noise occasionally coming from the facility and being unaware of the reasons for it. The Commission asked Cameco if it puts information on its Web site concerning activities, such as alarm testing, so the community is aware of what is happening. Cameco responded that in some cases it notifies the public to inform it of what will be happening, but in the case of moving equipment and maintenance, which are not unusual day-to-day occurrences, it does not.

158. The Municipality of Port Hope commented that Cameco's licensing application was vague and did not provide sufficient information to the public. The Commission asked Cameco to address this issue. Cameco stated that it had started posting supplemental information, including reports, CMDs and maps, on the community Web site and advertising that information in the local media so that information is available to the public.
159. The Commission commented that in the future Cameco needs to ensure that sufficient information is presented for the Day One hearing in order to minimize the supplementary material for Day Two. The Commission noted that this will give the public the maximum opportunity to evaluate and comment on the applicable information.
160. The Commission also asked Cameco to comment on providing the results of the ERA studies to the public. Cameco stated that it will make the results of all the follow-up programs from the ERA available to the public. Cameco added that some of the results had already been placed on the community Web site.
161. The Commission notes the recent initiatives taken by the licensee during the current licence period to improve communication with the community of Port Hope. The Commission further expresses the importance of a licensee's PIP to help develop and build public trust in the licensee's capacity to plan and carry on its licensed activities safely and, in doing so, making adequate provisions for the protection of the environment and the public.
162. The Commission is satisfied that Cameco's public information program is acceptable and will continue to be acceptable. The Commission expects that Cameco will sustain and, as appropriate, expand its program in areas of high public interest over the licence period. The Commission expects that Cameco will take into account the advice that it receives from the Municipality of Port Hope.

Security

163. Cameco stated that it conducted a review of its security provisions in 2001 and implemented improvements to site security including enhanced background screening of employees and the hiring of additional security guards. Cameco stated that it also hired an independent risk assessment firm to conduct a vulnerability assessment.
164. Cameco reported that in April 2006, it issued to the public a written security plan that did not contain prescribed information. Cameco stated that it has met the enhanced security requirements and continues to keep the CNSC security staff informed on security matters as appropriate.
165. Some intervenors, including members of the public and the Municipality of Port Hope, expressed concerns over the security of the facility. The Commission asked CNSC staff

to explain how security is regulated. CNSC staff responded that it conducts regular inspections of the Cameco Port Hope facility and any findings have been addressed immediately by Cameco.

166. CNSC staff stated that the amended *Nuclear Security Regulations*¹⁰ that came into effect on November 27, 2006 are applicable to the facility. CNSC staff noted that the amended *Nuclear Security Regulations* are a matter of public record and cover topics such as intrusion detection, enhanced vehicle searches and enhanced background checks of employees. CNSC staff stated that Cameco meets both the former regulations and the new amended *Nuclear Security Regulations*.
167. The Commission asked CNSC staff to explain the concept of robustness in regards to security. CNSC staff responded that robustness refers to the engineered and defence in depth strength of a particular facility to withstand an external intruder or an attack. CNSC staff noted that the facility has been assessed for robustness.
168. The Commission sought assurance that if the risk assessment changed, there would be a re-evaluation of security. CNSC staff assured the Commission that that is the case, as threats and vulnerabilities are assessed for all nuclear facilities, including this facility.
169. An intervenor expressed concerns about the security of railcars containing HF being at the Cobourg train station. The Commission sought further information on this matter. CNSC staff responded that the HF railcar falls under the jurisdiction of Transport Canada, as does the transportation of all hazardous goods. CNSC staff explained that Canadian National Railway (CN) is required to inspect the car at a set frequency and implement other security measures. CNSC staff noted that CN can store full and empty cars according to its shunting requirements and those decisions are made by CN.
170. CNSC staff further explained that it regulates hazardous materials within the licensed area in which Cameco operates. CNSC stated that once the chemicals are on-site it expects Cameco to take appropriate measures to protect the chemicals alongside the nuclear materials used at the facility. CNSC staff explained that a defence in depth analysis has included the recommendation to bring the HF railcars immediately into the facility where they become part of the enclosed facility.
171. The Commission is satisfied that Cameco has made and will continue to make adequate provision for the maintenance of security, national security and the measures required to implement international obligations to which Canada has agreed. The Commission notes that further discussions on security should be held between the security staff of Cameco, CNSC staff, the Municipality of Port Hope and the Chief of Police. The Commission expects CNSC staff to report any significant security issues back to the Commission as part of an in-camera session at a Commission Meeting.

¹⁰ S.O.R./2000-209

Non-Proliferation and Safeguards

172. The CNSC's regulatory mandate includes ensuring conformity with measures required to implement Canada's international obligations under the Treaty on the Non-Proliferation of Nuclear Weapons. Pursuant to the Treaty, Canada has entered into safeguards agreements with the IAEA. The objective of these agreements is for the IAEA to provide credible assurance on an annual basis to Canada and to the international community that all declared nuclear material is in peaceful, non-explosive uses and that there is no undeclared nuclear material or activities in this country.
173. CNSC staff reported that during the licence period, safeguards at Cameco Port Hope were extended to cover the entire plant, due to a change in IAEA policy. CNSC staff reported that the initial physical inventory verification of the newly safeguarded material was successfully completed in the summer of 2005. CNSC staff stated that Cameco has met the safeguards requirements laid out in the licence conditions.
174. Based on the above information the Commission is satisfied that Cameco has made and will continue to make adequate provision for the maintenance of national security and the measures required to implement international obligations to which Canada has agreed.

Decommissioning Plans and Financial Guarantee

175. CNSC staff reported that a proposed revised Preliminary Decommissioning Plan (PDP) was submitted in June 2006. CNSC staff stated that this revised PDP was submitted in part to resolve the concerns raised by the Commission during the mid-term performance hearing. CNSC staff noted that the proposed revised PDP was updated primarily to incorporate changes to the estimated costs of decommissioning, as well as account for the use of the Blind River site for management of long-term decommissioning wastes.
176. Cameco stated that the financial guarantee had increased costs due to many factors, including increased labour costs, the complexity of soil excavations, increased building demolition, equipment removal, decontamination costs, additional hazard assessments, and fuel price increases.
177. CNSC staff reported that it had completed its review of the revised PDP. CNSC staff stated that further revision was required in order for the PDP to be considered acceptable and form an adequate basis for a revised financial guarantee. CNSC staff noted that the most significant outstanding issue was related to the lack of end-state objectives in the proposed revised PDP. CNSC staff explained that adequate end-state objectives are required to allow for sufficiently accurate financial estimates of such factors as the volume of contaminated soil required to be excavated and the degree of administrative controls required to be established during decommissioning.

178. CNSC staff noted that the final PDP and financial guarantee will be forwarded to the Commission for its consideration and acceptance. CNSC staff stated that it will request the licensee to submit an amended letter of credit to cover the full cost of the financial guarantee in accordance with licence requirements.
179. The Commission asked CNSC staff if it had any concerns regarding the level of the financial guarantee. CNSC staff responded that the main issue with the financial guarantee cost estimate was that CNSC staff did not feel that the submitted cost estimate could be independently verified. CNSC staff explained that the starting point assumptions for the cost estimate assumed the drawdown of hazardous waste and nuclear substances in advance of decommissioning. CNSC staff stated that this would be an acceptable consideration for a PDP but not in relation to a cost estimate.
180. Further to the subject of the financial guarantee, CNSC staff stated that Cameco is providing the CNSC with a letter of credit as a financial instrument. CNSC staff explained that in the case of a default the CNSC would be in receipt of the funds and would have to conduct the decommissioning itself. Because of this, CNSC staff stated that all of the decommissioning activities have to be estimated from a third party costing perspective. CNSC staff noted that the cost estimates were assumed to occur in the fourth quarter of 2006 but an escalation of cost beyond that period was not provided for. CNSC staff also stated that the costs of maintaining the facility over the planned decommissioning period of approximately three years were not included in the cost estimate.
181. An intervenor expressed concerns about the decommissioning waste and where it would be stored. He stressed the importance of communications with the communities that would be impacted by the decommissioning. He also stated that he believed that the estimates for the financial guarantee appeared to be accurate.
182. Based on this information, the Commission considers that the plans for completing the Preliminary Decommissioning Plan and related financial guarantee are acceptable for the purpose of the current application for licence renewal.

Application of the *Canadian Environmental Assessment Act*

183. CNSC staff reported that the licence renewal would be made under the authority of Subsection 24(2) of the NSCA, in respect of a renewal. The renewal of Cameco's operating licence, under that provision, is not included in the *Law List Regulations* made pursuant to Paragraph 59(f) and is not a 'trigger' pursuant to Subsection 5(1) of the *Canadian Environmental Assessment Act*¹¹ (CEAA). Therefore, a CEAA trigger does not exist for Cameco's proposal and the CNSC is not required to conduct an environmental assessment of the proposal. There are no other CEAA triggers such as funding, being a proponent or disposing of an interest in land to support the application, pursuant to Subsection 5(1) of the CEAA that involve the CNSC.

¹¹ S.C. 1992, c. 37

184. Based upon the above assessment, the Commission is satisfied that an environmental assessment under the CEAA is not required for Cameco's application for licence renewal.

Licence Length and Interim Reporting

185. Cameco applied to the CNSC for renewal of its operating licence for a period of 60 months (5 years).
186. CNSC staff recommended that the Commission accept the proposed five-year term on the basis of a number of criteria listed in CMD 02-M12¹². CNSC staff also noted that it was prepared to submit a mid-term performance report to the Commission in the fall of 2009.
187. Many intervenors recommended a shorter licence period of two years or less. These intervenors felt that a shorter licence period would allow the CNSC to enforce the outstanding compliance issues such as fire protection.
188. The Commission notes that new projects that impact the community of Port Hope, including Cameco's Vision 2010 initiative, may be proposed during the 5-year licence period. The Commission points out that these projects are subject to the relevant regulatory process, including environmental assessments pursuant to the CEAA and Commission hearings pursuant to the NSCA, as applicable. The Commission expects that information and status updates on Cameco's projects will be included in the mid-term performance report.
189. Based on the above information, the Commission is satisfied that a 5-year licence with a mid-term report is appropriate. With this decision, the Commission requires that CNSC staff present a status report on the mid-term performance of the licensee to the Commission following the mid-term of the licence period (i.e., approximately in October 2009).

Conclusion

190. The Commission has considered the information and submissions of Commission staff, the applicant and all participants as set out in the material available for reference on the record, as well as the oral and written submissions provided or made by the participants at the hearing.
191. The Commission concludes that an environmental assessment of the proposed continued operation of the facility, pursuant to the *Canadian Environmental Assessment Act* is not required.

¹² Commission Member Document CMD 02-M12, *New Staff Approach Used to Recommending Licence Period*.

192. The Commission is satisfied that the applicant meets the requirements of subsection 24(4) of the *Nuclear Safety and Control Act*. That is, the Commission is satisfied that the applicant is qualified to carry on the activity that the proposed licence will authorize and that the applicant 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.
193. Therefore, the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, issues *Nuclear Fuel Operating Licence* FFOL-3631.0/2012 to Cameco Corporation for the Nuclear Fuel Facility located in Port Hope Ontario. The licence will be valid from March 1, 2007 to February 29, 2012, unless suspended, amended, revoked or replaced.
194. The Commission includes in the licence the recommendations made by CNSC staff in CMD 06-H18.C.
195. As noted throughout this *Record of Proceedings*, the Commission acknowledges the interest and understands the concerns of the Port Hope community in this matter.
196. The Commission expresses its view that the Cameco facility operations are effectively controlled with the safety programs in place and that they do not pose an unreasonable risk to the health and safety of persons, the environment and national security. The Commission is of the view that the continued enhanced public communication will further build public trust in the licensee's qualifications and in the provisions it makes to meet the requirements of the NSCA.
197. The Commission encourages the development of a Memorandum of Understanding between Cameco and the Municipality of Port Hope on the issue of fire protection. The Commission expects a report when this is addressed or within a year.
198. The Commission requests that CNSC staff prepare a status report following the mid-point of the five-year term of the licence. CNSC staff's status report shall be presented at a public proceeding of the Commission (in approximately October 2009) and will provide a summary of the performance of the licensee and facility.

Linda J. Keen,
President
Canadian Nuclear Safety Commission

Date of decision: November 29, 2006

Date of release of Reasons for Decision: February 26, 2007

Appendix A – Intervenors

Intervenors	Document Number
United Steelworkers, Local 13173, represented by C. Leavitt	CMD 06-H18.2
Graham Brown	CMD 06-H18.3
Families Against Radiation Exposure (F.A.R.E.), represented by J. Miller	CMD 06-H18.4 CMD 06-H18.4A
John Dietz	CMD 06-H18.5
Anthony Mancktelow	CMD 06-H18.6
Alice Mailath	CMD 06-H18.7
Rose Bungaro	CMD 06-H18.8
Rod and Joan Parrott	CMD 06-H18.9
Ray Morand	CMD 06-H18.10
Dennis J. Landwehr	CMD 06-H18.11
John Morand	CMD 06-H18.12 CMD 06-H18.12A
Arie Ashkenazy & Associates	CMD 06-H18.13
Deborah Panko	CMD 06-H18.14
Paula Evans-Gould	CMD 06-H18.15
Gary Donais	CMD 06-H18.16
John Belle	CMD 06-H18.17
Juliet Fullerton	CMD 06-H18.18
John E. Rainbird	CMD 06-H18.19 CMD 06-H18.19A
Sarah Clayton	CMD 06-H18.20
George Clements	CMD 06-H18.21
Louis Levtov	CMD 06-H18.22
Rodney J. Anderson	CMD 06-H18.23
Alderville First Nation, represented by R. Smoke	CMD 06-H18.24
Stan R. Blecher	CMD 06-H18.25
Bart Hawkins Kreps	CMD 06-H18.26
Nina Murchie	CMD 06-H18.27
Tom Lawson	CMD 06-H18.28
Audrey Levtov	CMD 06-H18.29
Patricia Lawson	CMD 06-H18.30 CMD 06-H18.30A
Andrew Johncox	CMD 06-H18.31
Nola McDonald	CMD 06-H18.32
Ian R. McDonald	CMD 06-H18.33
Farley Mowat	CMD 06-H18.34
Stephen B.H. Smith	CMD 06-H18.35
G. Albert Barraclough	CMD 06-H18.36
Louise Barraclough	CMD 06-H18.37
Port Hope Yatch Club	CMD 06-H18.38

Phill Boyko	CMD 06-H18.39
Janet Fishlock	CMD 06-H18.40
Limelight Advertising and Design, represented by P. Gabany	CMD 06-H18.41
Robert J. Neville	CMD 06-H18.42 CMD 06-H18.42A
Port Hope & District Chamber of Commerce, represented by H. Hills	CMD 06-H18.43
Glynnis Tomkinson	CMD 06-H18.44
James T. Hunt	CMD 06-H18.45
Miriam Mutton	CMD 06-H18.46
Bill Crowley	CMD 06-H18.47
Municipality of Port Hope, represented by C. Cannon and M. Stephenson	CMD 06-H18.48
Steve Kahn	CMD 06-H18.49
Holly Blefgen	CMD 06-H18.50
Celeste Stewart-McNamara	CMD 06-H18.51
Lake Ontario Waterkeeper, represented by L. Bowman	CMD 06-H18.52
Derrick Kelly	CMD 06-H18.53 CMD 06-H18.53A
Port Hope Nuclear Environmental Watchdogs	CMD 06-H18.54
Pat McNamara	CMD 06-H18.55
Canadian Nuclear Workers Council, represented by J. Usher and T. Fraser	CMD 06-H18.56 CMD 06-H18.56A
Ian W.M. Angus	CMD 06-H18.57
CAIR, represented by J. Morand	CMD 06-H18.58 CMD 06-H18.58A
Robert Lang	CMD 06-H18.59
Faye More	CMD 06-H18.60
Ashlea Tombs	CMD 06-H18.61
Diane Taylor	CMD 06-H18.62
John Floyd	CMD 06-H18.63
Peter M. Blecher	CMD 06-H18.64
Louise Ferrie-Blecher	CMD 06-H18.65
Karen Colvin	CMD 06-H18.66
Curtis Brisbois	CMD 06-H18.67
Stephen Sneyd	CMD 06-H18.68
Danielle Sneyd	CMD 06-H18.69
Sanford and Helen Anne Haskill	CMD 06-H18.70
Sierra Legal Defence Fund, represented by H. Wilkins	CMD 06-H18.71
Canadian Coalition for Nuclear Responsibility	CMD 06-H18.72
Brian Parr	CMD 06-H18.73
Lou Rinaldi, M.P.P., Northumberland	CMD 06-H18.74
Ian P. Tate	CMD 06-H18.75
Diana and Matt Flesch	CMD 06-H18.76
Anna Mosher	CMD 06-H18.77
George Harvey	CMD 06-H18.78
Lynda Hook	CMD 06-H18.79

Nor-Ag Resources Inc.	CMD 06-H18.80
Brett Stephens	CMD 06-H18.82
Gerhard Heinrich	CMD 06-H18.83
David Doherty	CMD 06-H18.84
Cynthia L. Adams	CMD 06-H18.85
Wayne Byers	CMD 06-H18.86
Stewart Raynor	CMD 06-H18.87
Barry Sanders	CMD 06-H18.88
Laurie B. Johnson	CMD 06-H18.89
Christa Ingalls	CMD 06-H18.90
David Ingalls	CMD 06-H18.91
Bob Routly	CMD 06-H18.92
Marilyn Routly	CMD 06-H18.93
Tom Fraser	CMD 06-H18.94
Ed Lloyd	CMD 06-H18.95
Doug Westlake	CMD 06-H18.96
Chris Watt	CMD 06-H18.97
Gordon N. Walter	CMD 06-H18.98
Paul Macklin	CMD 06-H18.99
Robert and Jean Adams	CMD 06-H18.100
Sarah vanSteijn	CMD 06-H18.101
Shane Watson	CMD 06-H18.102
Mikhail Ioffe	CMD 06-H18.103
John Mulligan	CMD 06-H18.104
Carl Griese	CMD 06-H18.105
Michael Murchie	CMD 06-H18.106
Edna Bosnell	CMD 06-H18.107
Rob Brulé	CMD 06-H18.108
Laurie Batchellor	CMD 06-H18.109
Lori Altman	CMD 06-H18.110
Lori Cater	CMD 06-H18.111
Doug Hodgins	CMD 06-H18.112
Robert A. Wallace	CMD 06-H18.113
Ed Lam	CMD 06-H18.114
Doug Choinière	CMD 06-H18.115
Debbie Hoselton	CMD 06-H18.116
Robert and Helen Hennessy	CMD 06-H18.117
Barbara and Lloyd Blanchard	CMD 06-H18.118
Sam Fleming	CMD 06-H18.119
Habitat for Humanity Northumberland	CMD 06-H18.120
Gillian McNamee	CMD 06-H18.121
Marleen Campbell	CMD 06-H18.122
Rebecca Peters	CMD 06-H18.123
Community Awareness and Emergency Response	CMD 06-H18.124
Margaret Bradley	CMD 06-H18.125

Fraser Mumford	CMD 06-H18.126
Rick Norlock	CMD 06-H18.127
Anna M. V. Mutton	CMD 06-H18.128
Mike Wladyka	CMD 06-H18.129
Betty Finnie-Hunt	CMD 06-H18.130
Dave McElroy	CMD 06-H18.131
Darren Clarke	CMD 06-H18.132
Gioulchen Tairova	CMD 06-H18.133
Russell Boate	CMD 06-H18.134
Northumberland United Way	CMD 06-H18.135
Terry Highfield	CMD 06-H18.136
Sharon and Mike McBride	CMD 06-H18.137
Wm. Oliver Excavating and Grating Ltd.	CMD 06-H18.138
Neil Pemberton	CMD 06-H18.139
Vandermeer Toyota	CMD 06-H18.140
Colleen and Jim Dobie	CMD 06-H18.141
Michael Marsh	CMD 06-H18.142
Roldano Dalla Rosa	CMD 06-H18.143
John Krause	CMD 06-H18.144
Rose Campell	CMD 06-H18.145
Myron Szalawiga	CMD 06-H18.146
Liz Stewart	CMD 06-H18.147
Jackie Brimblecombe	CMD 06-H18.148
Marc Boucher	CMD 06-H18.149
Aldo D'Agostino	CMD 06-H18.150
Residents of Northumberland County	CMD 06-H18.151
Elizabeth Benne	CMD 06-H18.152
Hill and Dale Manor	CMD 06-H18.153
Anita Blackwood	CMD 06-H18.154
Esther Valliant	CMD 06-H18.155
Peter Wiczorek	CMD 06-H18.156
Simon J. Reid	CMD 06-H18.157
Carol Kirton	CMD 06-H18.158
Wakely Transportation Service Limited	CMD 06-H18.159
Raymond Foote	CMD 06-H18.160
Northumberland Manufacturers Association, represented by S. Rosa	CMD 06-H18.161
Port Hope Community Health Concerns Committee, represented by F. More	CMD 06-H18.162 CMD 06-H18.162.A
Mary Birkett	CMD 06-H18.163
Roger N. Carr	CMD 06-H18.164
Northumberland Hills Hospital	CMD 06-H18.165