

Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant Cameco Corporation

Subject Application for a Licence to Operate the Port
Hope Nuclear Fuel Facility

Date February 18, 2002

RECORD OF PROCEEDINGS

Applicant: Cameco Corporation

Address/Location: 2121-11th Street West, Saskatoon, Saskatchewan S7M 1J3

Purpose: Application for a licence to operate the Port Hope Nuclear Fuel Facility

Application received: July 5, 2001

Date(s) of hearing: November 15, 2001 January 17, 2002

Location: Canadian Nuclear Safety Commission (CNSC) Public Hearing Room, 280 Slater St., 14th. Floor, Ottawa, Ontario

Members present: L.J. Keen, Chair Y.M. Giroux
C.R. Barnes L.J. MacLachlan
A.R. Graham

Counsel: S.K. Fraser (Day 1) and I.V. Gendron (Day 2)

Secretary: M.A. Leblanc

Recording Secretary: C.N. Taylor

Applicant Represented By	Document Number
B. Michel, Chair and Chief Executive Officer J. Jarrell, Vice-President of Environment and Safety B. Steane, Vice-President, Fuel Services Division H. Carisse, Manager Technical Services F. Dobri, Superintendent, Quality Assurance and Licensing	CMD 01-H32.1 and CMD 01-H32.1A
CNSC Staff	Document Number
K. Pereira M. White B. Howden P. Thompson	CMD 01-H32 CMD 01-H32.A
Intervenor	Document Number
See Appendix A	

Decision and Reasons:

Licence/Amendment: Issued: X
Date of Decision: January 17, 2002

1. Introduction

Cameco Corporation (Cameco) of Saskatoon, Saskatchewan, has applied to the Canadian Nuclear Safety Commission (CNSC) for the renewal of its licence to operate its uranium conversion facility in the Municipality of Port Hope, Ontario for a period of five years. The facility is currently licensed under operating licence FFOL-3631.1/2002 which expires on February 28, 2002.

The Port Hope Conversion Facility is located within the Municipality of Port Hope, Ontario on the north shore of Lake Ontario approximately 100 km east of the City of Toronto, Ontario. The facility is used primarily to convert uranium trioxide (UO₃) powder, produced at Cameco's Blind River facility, to uranium dioxide (UO₂) and uranium hexafluoride (UF₆). UO₂ is used in the manufacture of CANDU reactor fuel while UF₆ is exported for further processing into light water reactor fuel. In addition, a special metals plant at the facility is used to convert uranium tetrafluoride into uranium metal for use as shielding and for counterweights for aircraft. The facility also includes recycling and decontamination operations and a stand-by plant for UO₂ production.

2. Decision

The Canadian Nuclear Safety Commission, in making its decision, considered information presented at a public hearing held on November 15, 2001 and January 17, 2002 in Ottawa, Ontario.

Based on its consideration of the matter, as described in more detail in the following sections,

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-3631.0/2007, is valid from March 1, 2002 to February 28, 2007, unless suspended, amended, revoked or replaced.

The decision reflects the views of the majority of the Commission Members. Member Dr. C.R. Barnes dissented on the five-year duration of the licence and held that the licence be issued for a duration of three years. The reasons in the dissenting opinion of Dr. Barnes are presented in Section 4.11 of this *Record of Proceedings*.

With this decision, the Commission requires that CNSC staff prepare a status report at the mid-point in the five-year licence period. The status report will be presented to the Commission at a future public proceeding of the Commission (approximately August 2004). The status report will address the overall performance of the licensee and facility with respect to the protection of the health and safety of persons, the environment and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

The Commission further requests CNSC staff to prepare in one year an information report on the design and implementation of an environmental effects monitoring program at the Port Hope Conversion Facility.

The reasons and requirements for the above-noted reports are discussed further in sections 4.1, 4.3 and 4.11 of this *Record of Proceedings*.

The Commission includes in the licence the conditions of the previous licence, modified as recommended by CNSC staff as follows:

- the licence conditions are relabeled using a numeric rather than alpha-numeric system.
- the required reporting frequency in Condition 10.3 (b) (formerly R4 (b)) is changed from monthly to annually (by March 15 of each year).

The Commission also adds the following new licence conditions as recommended by CNSC staff:

- 1.4 The licensee shall submit, by April 30, 2002, a plan and schedule for the implementation of its corporate Quality Assurance Program.
- 1.5 The licensee shall maintain a financial guarantee for decommissioning acceptable to the Commission or a person authorized by the Commission.
- 7.1 The licensee shall maintain security measures, as specified in the Facility Licensing Manual document referenced in Appendix "B" to this licence, for protecting the facility and preventing theft, loss or any unauthorized use of the nuclear substances associated with the activities authorized by this licence.
- 8.1 The licensee shall design, build, modify and otherwise carry out work related to the facility with potential to impact protection from fire in accordance with the National Building Code, 1995 and the National Fire Code, 1995.
- 8.2 The licensee shall operate, maintain, test and inspect the facility in accordance with the National Fire Code, 1995.
- 8.3 The licensee shall, prior to implementation, submit any proposed modification of the facility with potential to impact protection from fire, for third-party review of compliance with Condition No. 8.1 and the standards listed therein. The review shall be carried out by one or more independent external agencies having specific expertise with such reviews and shall be submitted, by the licensee, to the Commission, or a person authorized by the Commission.
- 8.4 The licensee shall arrange for annual third-party reviews of compliance with the inspection requirements of the National Fire Code, 1995. The review shall be carried out by one or more independent external agencies having specific

expertise with such reviews and shall be submitted, by the licensee, to the Commission, or a person authorized by the Commission.

- 8.5 In the event of any conflict or inconsistency between a nuclear safety requirement and the National Building Code, 1995, or the National Fire Code, 1995, the licensee shall direct the conflict or inconsistency to the Commission, or a person authorized by the Commission, for resolution.

Licence conditions 8.1 to 8.5 above are standard conditions now included in all Class I facility licences.

The Commission also modifies Appendix B of the licence as recommended by CNSC staff to refer to an Operating Release Limit for uranium and gamma radiation emissions that reflects a maximum allowable radiation dose to a critical group member of the public of 0.3 mSv/y.

3. The Public Hearing Process

The public hearing, conducted under the *Nuclear Safety and Control Act* and the *Canadian Nuclear Safety Commission Rules of Procedure*, was held in Ottawa, Ontario over two days; November 15, 2001 and January 17, 2002. The Commission received written submissions and heard oral presentations from CNSC staff (CMD 01-H32 and CMD 01-H32.A) and Cameco Corporation (CMD 01-H32.1 and CMD 01-H32.1A), United SteelWorkers of America (CMD 01-H32.2), Canadian Nuclear Workers Council (CMD 01-H32.3), and Port Hope and District Chamber of Commerce (CMD 01-H32.8). The Commission also considered written submissions from the Port Hope Community Health Concerns Committee (CMD 01-H32.4), the Port Hope Nuclear Environmental Watchdogs (CMD 01-H32.5), the Corporation of the Town of Deep River (CMD 01-H32.6), the Corporation of the Municipality of Port Hope (CMD 01-H32.7), and Sierra Club of Canada (CMD 01-H32.9).

The submissions from the Port Hope Community Health Concerns Committee (CMD 01-H32.4) and the Port Hope Nuclear Environmental Watchdogs (CMD 01-H32.5) were originally scheduled for oral presentations at day-2 of the hearing; however, the presenter, Ms. F. More, was unable to attend due to inclement weather on the day of the hearing. The CNSC Secretariat attempted, but were unsuccessful in contacting Ms. More to arrange for her participation in the hearing by teleconference. Therefore, the previously filed documents from the Port Hope Community Health Concerns Committee (CMD 01-H32.4) and the Port Hope Nuclear Environmental Watchdogs (CMD 01-H32.5) were considered by the Commission as written submissions for the purpose of the hearing.

4. Issues and Commission Findings

4.1 Radiation Protection

The Commission considered information on the past performance of Cameco at the Port Hope Conversion Facility to assess whether the licensee has demonstrated its ability to adequately provide for the protection of workers and the public from radiation.

4.1.1 Protection of Workers

CNSC staff reported that Cameco did not exceed the regulatory dose limits for workers at the facility during the current licensing period. CNSC staff expressed the opinion that Cameco's radiation protection program for workers is adequate, that it incorporates appropriate Action Levels, and that it effectively applies the principles of ALARA (as low as reasonably achievable, social and economic factors taken into account).

CNSC staff explained to the Commission that significant potential pathways for radiation exposure of workers at the facility are through ingestion, inhalation and absorption and, therefore, internal dosimetry is important for monitoring worker dose. Staff noted, however, that the internal dosimetry program at the facility remains subject to the *Transition Plan* exemptions under the *Nuclear Safety and Control Act* (CMD 00-M19 as amended). Under the *Transition Plan*, Cameco is exempt until the end of March 2003 from the requirement to ascertain the internal component of the effective and equivalent doses received by, or committed to, persons at the facility. The exemption is to allow time for the purchase and installation of new, more sensitive lung-counting equipment that will make this measurement possible. CNSC staff noted that despite the current unavailability of the more sensitive lung counter, the information obtained from the current urinalysis, air and surface contamination monitoring, and the current, less sensitive lung counting equipment, provides reliable evidence that internal radiation exposures to workers are being effectively controlled. Cameco noted that, with the exception of one non-routine urinalysis report that was promptly addressed, there have been no significant uptakes of radioactive material by workers. Cameco noted that this conclusion is supported by tests carried out with the assistance of Health Canada.

During the hearing, the Commission questioned the representatives from the United Steelworkers of America and the Canadian Nuclear Workers Council on whether the unions are aware of any concerns or complaints about radiation safety or long-term health effects from the current or former workers at the Cameco facility. In response, those organizations reported that they have not heard any such concerns. It was noted that workers do periodically ask questions about radiation and conventional health and safety in the work place and that these matters are promptly and satisfactorily addressed on the spot, or with the assistance of Cameco's Health and Safety Committee.

The Commission questioned Cameco on the degree to which it monitors and tracks the long-term health of its employees. Cameco replied that although it has some medical information on its employees (as gathered by the company doctor and nurse), it does not have sufficient data to

conduct a scientific health study. Cameco noted that it maintains radiation exposures well below the limits designed to protect the health of workers from radiation.

4.1.2 Protection of the Public

4.1.2.1 Regulatory Requirements

With respect to radiation doses to the public, CNSC staff reported that Cameco has not exceeded the applicable regulatory limits during the past licensing period and that the principles of ALARA are being applied appropriately. CNSC staff conservatively estimated the maximum dose to a member of the public in 2001 at 0.1 mSv. CNSC staff noted that, at this facility, the regulatory Derived Release Limits (DRLs), as well as the lower Operational Release Levels (ORLs), are derived using a maximum permissible dose to a member of the public of 0.3 mSv/a, rather than the full regulatory limit of 1.0 mSv/a.

The Port Hope Community Health Concerns Committee (PHCHCC), Port Hope Nuclear Environmental Watchdogs (PHNEW), and Sierra Club of Canada (SCC) expressed concern about the lack of a buffer zone between the facility and residential areas. They consider that to protect people in those circumstances, no further accumulation of uranium in the environment surrounding the facility should be permitted. In response to those concerns, CNSC staff and a representative from Ontario Ministry of the Environment, Ms. L. Mora, expressed the opinion that the concentrations of uranium measured in the air and in the soil are well below levels that could adversely affect human health. CNSC staff and Ms. Mora further explained that the proposed ambient air contamination standards in development by the Ontario Ministry of the Environment are being designed to ensure that threshold effect levels for human and environmental health would not be reached over time. CNSC staff explained that the emission limits and controls (i.e., Derived Release Limits and Operating Release Levels) are set using accepted methods and exposure scenarios that reflect the population patterns in the area. SCC, in its intervention, expressed concern about the methods used in setting the DRLs and uranium contamination standards for the facility, but did not elaborate on the specific nature of that concern. Staff further explained that the facility emissions and environmental monitoring programs will detect any unusual increases in emissions or accumulation in the environment so that early regulatory action can be taken to protect people and the environment.

4.1.2.2 Long-Term Health Effects

Three intervenors, PHCHCC, PHNEW, and SCC, expressed concerns with what they consider to be inadequate efforts to conduct credible and independent health studies in the Port Hope community. The PHCHCC and PHNEW are not satisfied that the health effects of uranium operations during the past 60 years in Port Hope, together with the effects of the current facility operations, are being adequately assessed. The PHCHCC and PHNEW expressed the view that the CNSC has shown a lack of commitment to the conduct of credible health studies. Due to what the PHCHCC and PHNEW view as a conflict of interest on the part of CNSC, the PHCHCC and PHNEW consider that the CNSC should no longer engage in health studies. The PHCHCC and PHNEW intervention was also highly critical of the Cancer Incidence Study

completed recently by Health Canada, referring or appending to their written interventions the conclusions of three separate technical reviews of that study.

In response to the above concerns of the intervenors, the Commission asked CNSC staff to comment on the credibility and validity of the critical reviews of the Cancer Incidence Study cited by the PHCHCC and PHNEW. In response, CNSC staff noted that the Cancer Incidence Study was done by researchers and scientists at Health Canada who CNSC staff consider have the appropriate qualifications and experience for such studies. CNSC staff further explained that the comments of the peer reviewers (Dr. Mintz and Dr. Darlington) were forwarded to Health Canada and that CNSC staff are satisfied with the responses of Health Canada to those peer review comments. CNSC staff further expressed the opinion that the criticisms from the other reviewers cited by the PHCHCC and PHNEW (i.e., by Dr. B. Leece, and Dr. R. Bertell) are unjustified and that the qualifications of the reviewers are not suited to the review this type of epidemiological health study. CNSC staff noted that the PHCHCC and PHNEW have requested funding of a study of their own design, which CNSC staff does not consider to be scientifically valid.

During the hearing, the Commission questioned the representatives from the United Steelworkers of America, the Canadian Nuclear Workers Council and Port Hope Chamber of Commerce as to whether they routinely become aware of concerns from the public about the effects of the Cameco facility. Those intervenors responded that they do not hear any such concerns in their daily interactions with the public.

In response to a follow-up question from the Commission, CNSC staff reaffirmed that none of the criticisms of the health study contained, or referred to in the PHCHCC and PHNEW interventions (CMD 01-H32.4 and 01-H32.5) have changed CNSC staff's overall positive conclusion concerning the safety of the proposed continued operation of the Cameco Port Hope Conversion Facility.

The Commission acknowledges that the PHCHCC, PHNEW and SCC are seriously concerned about what they believe are potentially significant cumulative health effects from the Cameco facility and the past uranium contamination in Port Hope. The Commission also acknowledges that those groups are also dissatisfied with the recent efforts by the federal government to conduct scientific investigations of those potential health effects. The Commission is of the opinion, however, that the debate concerning the Health Canada's Cancer Incidence Study, and the questions raised about whether more or different health studies should be done in future are matters that go beyond the scope of this hearing and licence application.

The Commission is of the opinion that there currently exists an adequate basis of scientific information to make decisions with respect to the risks that the proposed facility operations pose to human health and safety. In that regard, the Commission is satisfied that the proposed continued operation of Cameco's Port Hope Conversion Facility will not result in an unacceptable incremental or cumulative radiation risk to workers or the public.

The Commission concurs with the CNSC staff recommendation that a detailed status report be presented at a public proceeding of the Commission at the mid-point in the licence term (in

approximately August 2004). The Commission's reasons with respect to the licence term are presented in section 4.11 below. The status report will address the topic identified in Appendix A of CMD 01-H32.A), including an update on the projected potential risk that the facility poses to the health of Port Hope residents.

The Commission's finding with respect to how the accumulation of uranium in the environment could affect non-human biota is discussed further in section 4.3 of this *Record of Proceedings*.

4.2 Occupational Health and Safety

The Commission considered information on the non-radiological health and safety of workers at the Cameco Port Hope Conversion Facility.

CNSC staff reported that Cameco has instituted an effective Health and Safety Committee as required by the *Canada Labour Code*. CNSC staff and Cameco noted that the Health and Safety Committee meets at least monthly and allows for the full participation of all levels of staff and management. CNSC staff also noted that Cameco is in compliance with all other applicable aspects of the *Canada Labour Code* and that CNSC staff coordinates its efforts with Human Resources Development Canada to monitor that compliance.

CNSC staff noted that the storage and handling of significant quantities of hazardous chemicals is of particular importance for safety at this facility. In that regard, CNSC staff reported that a recent safety analysis indicates that Cameco's measures provide adequate protection of workers from those types of hazards.

Cameco reported to the Commission that it has maintained a very high level of safety at the plant with only one lost-time injury recorded in the current licensing period. Two intervenors to the hearing (United Steelworkers of America, and Canadian Nuclear Workers Council) attested to Cameco's commitment to a highly functional and active health and safety culture at the plant.

Based on this information, the Commission is satisfied that Cameco is making adequate provisions for protecting the health and safety of workers from non-radiological hazards at the facility.

4.3 Environmental Protection and Monitoring

The Commission considered information on the performance of Cameco in regard to the protection of the environment in the vicinity of the Port Hope Conversion Facility.

4.3.1 Facility Emissions – Regulatory Requirements

CNSC staff noted that releases to the environment from the facility are being effectively controlled and monitored in accordance with the licence conditions and provincial regulatory

requirements. CNSC staff noted that uranium, fluorides and hydrofluoric acid are the main contaminants of potential concern for the environment.

CNSC staff noted that five environmental events occurred during the licensing period which resulted in unplanned releases to the environment. One of those events, involving the release of 58 kg of Freon, resulted in a warning from Environment Canada. CNSC staff noted that none of the events caused significant environmental harm and were promptly addressed by Cameco. Cameco noted that although occasional problems arise with respect to suspended solids in liquid effluents (due to algae growth in periods of low flow), all provincial MISA (Municipal Industrial Strategy for Abatement) toxicity requirements were consistently met.

In response to the Commission's questions on the quality of the treated process water, Cameco explained that the treated effluent consists largely of distilled water from the evaporator and is discharged directly to Lake Ontario. Cameco further explained in supplementary information to the hearing that the process effluent and cooling water is monitored for uranium, fluoride, ammonia, nitrates, suspended solids, selected heavy metals and toxicity. No exceedances of the regulatory requirements were recorded during the current licensing period.

4.3.2 Environmental Management System

Cameco noted that its Environmental Management System (EMS) was successfully registered under the ISO Standard 14001 in February 2000 and that this program is formally integrated with the other quality assurance programs on the site (see section 4.5 below on Quality Assurance). Cameco noted that its EMS places strong emphasis on waste reduction and recycling with the result that Cameco has reduced the facility waste management requirements by 90% since the late 1980s.

4.3.3 Environmental Monitoring

CNSC staff expressed the view that the current environmental monitoring program is acceptable. The program consists of stack emissions, ambient air quality, dust fall, fluoride in vegetation, ground and surface water quality, gamma fields and uranium accumulation in soil.

4.3.3.1 Groundwater Monitoring

Cameco noted that recently enhanced groundwater monitoring at the site has verified the subsurface flow patterns beneath the site and the presence of contamination from historic operations. In response to questions from the Commission on the observed levels of arsenic in the groundwater, CNSC staff confirmed that there are no current sources of arsenic at the facility.

4.3.3.2 Emissions and Air Quality Monitoring

Cameco explained that its air quality monitoring consists of emission monitoring at the point of release and ambient air quality monitoring (including the use of high-volume air samplers for suspended uranium, dust-fall monitors for estimating particulate accumulation on soils, and lime

candles and vegetation to measure fluoride in the surrounding environment). Cameco reported that its uranium emissions from the stack have continued to improve over time due to various operating improvements. CNSC staff noted that Cameco is in compliance with the air emission limits and that the concentrations of contaminants in the air do not pose a significant risk to animals and vegetation.

4.3.3.3 Uranium in Soil Monitoring

Cameco noted that the monitoring of uranium in soils, carried out by both Cameco and the Ontario Ministry of the Environment, is showing inconsistent results. Cameco expressed the opinion that the inconsistencies may be indicative of complex processes of re-entrainment and migration of contamination from past operations, as opposed to direct deposition from current emissions. The Commission requested more detailed information on the soil monitoring programs prior to the conclusion of the hearing, including on the soil sampling program being conducted in the same area by the Ontario Ministry of the Environment.

In response to that request, CNSC staff and Cameco provided supplemental information for the second hearing day. As well, a representative of the Ontario Ministry of the Environment was present on day-2 to respond to questions from the Commission on the soil sampling program.

CNSC staff explained that the assessment of effects of uranium in soil on both human and non-human biota must take into account the existing levels of uranium contamination in the soil, the rate of ongoing accumulation, and the different thresholds for effect. CNSC staff estimated those thresholds as: 1,200 µg/g for humans; 300 µg/g for vegetation; and 100 µg/g for soil invertebrates. CNSC staff concluded that even after 100 years of accumulation at current rates, and assuming no contaminant removal mechanisms in the soil, only very localized areas in the immediate vicinity of the facility would exceed the 100 µg/g threshold for invertebrates.

In response to questions from the Commission on the accuracy of the predictive model currently employed, CNSC staff expressed its opinion that the dispersion models being used are appropriate and show reasonably good correlation with the air and dust-fall monitoring results, as well as with the measurements of uranium concentrations in the surface layers of the soil. CNSC staff further reported that a two-year research project had recently been initiated by the CNSC to gather more information on the Port Hope soil characteristics and the toxicity of uranium to invertebrates. CNSC staff explained that the research may improve the ability to model the uranium behaviour following deposition on the soil and to better predict its impact on soil biota. CNSC staff noted that until that study is complete, the 100 µg/g threshold selected for the current evaluation is considered by CNSC staff to be sufficiently conservative to assure protection of biota.

Cameco also responded to the Commission's request for information on uranium soil contamination by outlining how the air sampling, dust-fall and background soil monitoring in the vicinity of the plant correlate with the modelled predictions using the emission rate data. Cameco reiterated its view that the lack of correspondence with the experimental soil plot measurements may be due to poorly understood soil mechanisms and processes in the experimental soil pots. Ms. L. Mora of Ontario Ministry of the Environment, who administers

two of the five soil plots, noted that the variability in the soil plot sample data is not unusual or surprising and may be influenced by the presence of historic contamination and the lack of a large tract of land for establishing a more controlled experiment. As an example of how historic contamination is playing a role, Ms. Mora noted that some uranium contamination from historic deposition appears to be entering the experimental soil pots from the bottom of the pots and that it may be some years before the contamination from the top and bottom of the pots reach equilibrium.

CNSC staff and Ms. Mora explained that the Ontario Ministry of the Environment is completing studies for the purpose of calculating soil concentration thresholds for non-human biota in the soil. Those thresholds would then be used to back-calculate acceptable air concentration levels specific to the protection of soil biota. A draft standard for public consultation is expected later in 2002. In regard to that proposed standard, intervenors (PHCHCC and PHNEW) expressed their objection to allowing any further incremental accumulation of uranium in the soil. PHNEW pointed to the results of the monitoring by the Ontario Ministry of the Environment which PHNEW considers indicates a continuing and rapid accumulation of uranium in locations near the facility and levels of heavy metals that already exceed the provincial clean-up criteria. The PHCHCC and PHNEW are of the view that the setting of an air criterion in the manner proposed by the Ministry of the Environment will result in the continued accumulation of uranium in soil to the point that it eventually becomes toxic to vegetation. PHCHCC and PHNEW consider that this benefits only the polluter and places an unacceptable health and cost burden on the public. The PHCHCC expressed the view that the Ministry of the Environment needs to continue to study the type, level, dispersion and environmental effects of uranium emissions. In response to those concerns, CNSC staff reiterated its opinion that the current emissions from the facility are not likely to cause adverse environmental effects over time. CNSC staff also noted that it continues to work closely with the Ministry of the Environment on the proposed air standard. CNSC staff considers that the standard will provide a conservative risk management tool designed to ensure that uranium accumulations do not result in adverse environmental effects over time.

Noting the variability, uncertainties and limited information on the soil contamination issues, the Commission questioned CNSC staff and the Ministry of the Environment representative on what other research has been done or is planned to improve confidence in the prediction of effects and setting of limits for soils contamination. In response, CNSC staff noted that, in addition to the above-described Ontario Ministry of the Environment standard development and CNSC site-specific research in Port Hope, there has been significant research recently done under the auspices of the Canadian Council of Ministers of the Environment. CNSC staff explained that that research has led to the drafting of soil guidelines which are soon to be published. CNSC staff noted that the draft guidelines have been subjected to extensive public, government and scientific peer review. The Ontario Ministry of the Environment also noted the ongoing cooperation of Cameco and CNSC staff in the Ministry of the Environment's continuing experiments on soils near Cameco's Port Hope and Blind River facilities and in the development of the proposed air concentration standard.

4.3.3.4 Environmental Effects Monitoring

CNSC staff noted during the hearing that the control limits and levels for emissions and effluents at the Port Hope Conversion Facility have historically been fixed on the basis of criteria for protection of human health, as opposed to both human health and the health of non-human biota (i.e., environmental effects). The *Nuclear Safety and Control Act* now explicitly requires licensees to make provisions for the protection of the environment. Staff explained during the hearing that the purpose of the current assessments and above-noted research and criteria development for uranium in soil and air is to address the environmental effects on other non-human biota. CNSC staff expressed the opinion that more needs to be done to measure the actual effects of the Port Hope Conversion Facility on aquatic biota in the Port Hope Harbour. CNSC staff noted that the longer-term accumulation of the small releases to the harbour sediment, although not predicted to have a significant incremental adverse effect on the biota in that sediment, has not actually been confirmed by field measurements. As a result, CNSC staff expressed the view that Cameco needs to directly monitor the harbour sediments and the resident biota to measure the actual environmental effects, thereby allowing an assessment of the accuracy of the predicted effects. CNSC staff noted during the hearing that it will therefore be requiring Cameco to design and add to its environmental monitoring program an “environmental effects” component. The Sierra Club of Canada, in its intervention, also expressed concern over the lack of a comprehensive environmental monitoring program at this facility.

Based on the information provided, the Commission is of the opinion that the contaminants released to the environment from the facility are not causing, and are not likely to cause, significant incremental risk to the environment. The Commission concludes therefore that Cameco is making, and will continue to make, adequate provision for the protection of the environment in the operation of the Port Hope Conversion Facility.

However, because there remains uncertainty with respect to the accumulation of uranium and other contaminants in surrounding soils and harbour sediments, and because direct monitoring of the environmental effects on the biota in the soils and harbour sediment has yet to be instituted, the Commission concurs with the CNSC staff recommendation that a detailed status report on the environmental performance of the facility (among the other performance matters outlined in the appendix to CMD 01-H32.A) be brought before the Commission at the mid-term of the licence period (approximately in 2.5 years). In addition, the Commission requests CNSC staff to provide an information report to the Commission in one year on the status of the design and implementation of the proposed environmental effects monitoring program.

4.4 Qualifications of the Proponent

Before issuing a licence, the Commission must be satisfied that Cameco is qualified to carry out the proposed activities under the licence. In this regard, the Commission considered the overall positive recommendation of CNSC staff and the other information provided for the hearing.

CNSC staff noted that it is continuing to follow-up on issues requiring clarification and improvement that were identified during an audit of the facility organization and management in

October 2000. Those issues relate primarily to the need for a training strategy to which Cameco indicated its commitment. Cameco also reported that it is presently formalizing the training strategy in support of the other quality assurance initiatives at the facility.

Based on the information presented, the Commission concludes that Cameco is qualified to carry out the proposed activities.

4.5 Quality Assurance

CNSC staff reported that although Cameco has a comprehensive and effective quality assurance program for the facility, Cameco is not yet in compliance with the CNSC's requirements for the integration of quality assurance at the corporate level. To address this deficiency, CNSC staff recommended the addition of a licence condition that requires Cameco to submit, prior to April 30, 2002, a schedule and plan for completing the corporate component of the quality assurance program.

Cameco expressed its commitment to corporate quality assurance and is actively bringing all of its facilities under corporate oversight as directed by the CNSC. Cameco highlighted that its Environmental Management System is now certified under ISO 14001 and that this forms an important component of the overall quality assurance program. Cameco further explained how the periodic revisions to the Safety Report are used for instituting continuous improvement at the plant. Cameco also noted that the Port Hope Conversion Facility is the leader in quality assurance within the company.

On the basis of the acceptable quality assurance at the facility and Cameco's commitments to comply with the remaining quality assurance requirements, the Commission is satisfied that, for the purpose of the proposed operations, Cameco is taking adequate steps to complete an acceptable quality assurance program. The Commission furthermore concurs with CNSC staff concerning the need for a licence condition that requires Cameco to submit to the CNSC, by April 30, 2002, a plan and schedule for addressing the remaining the quality assurance requirements.

The Commission also concurs with CNSC staff that a status progress report on the performance of the licensee and facility should be brought before the Commission at approximately the mid-point in the licence term. That report will include, among the other items identified in the Appendix to CMD 01-H32.A, an update on Cameco's compliance with quality assurance requirements.

4.6 Security and Safeguards

CNSC staff reported that Cameco has met all safeguards licence conditions and provided all of the information and made all of the preparations necessary in support of Canada's safeguard agreement (and Additional Protocol) with the International Atomic Energy Agency (IAEA).

CNSC staff also noted that a revision to the safeguards-relevant design information for the facility is in advanced stages of preparation for submission to the IAEA.

CNSC staff further reported that Cameco continues to implement adequate security measures at the facility and has responded appropriately to the recent CNSC Order for enhanced security at nuclear facilities following the terrorist events in the United States on September 11, 2001.

In response to the Commission's questions about where the specific security requirements are cited in the licence, CNSC staff explained that those requirements are currently specified in the documents referred to in the licence conditions. To add clarity, CNSC staff proposed during the hearing that a licence condition, specific to security, be added.

The Commission questioned Cameco on a reported breach of security during the licensing period which involved a person scaling a site perimeter fence. Cameco confirmed for the Commission that the fences are monitored for this type of intrusion.

Based on the above information, the Commission is satisfied that Cameco is making, and will continue to make adequate provisions for security and safeguards at the conversion facility. Furthermore, the Commission concurs with CNSC staff on the need for, and proposed wording of, a licence condition specific to the security requirements.

4.7 Emergency Preparedness and Response

CNSC staff reported that Cameco's Emergency Procedures Manual is acceptable and is presently being updated to ensure all aspects of new CNSC guide document G-225 are reflected.

Cameco explained that, in an effort to facilitate the response to emergency events related to chemical spills, all chemical loading facilities are being enclosed or moved indoors. In addition, Cameco reported that it has enhanced all spill detection and emergency ventilation and filtration systems. With respect to the emergency plan, Cameo explained that regular tours and drills involving the local fire department are held at the facility. Furthermore, Cameco reported that a major joint emergency drill, involving a simulated large chemical spill, was held with the municipality in 2000.

In their interventions to the hearing, the Municipality of Port Hope and the Port Hope District Chamber of Commerce attested to the positive leadership role taken by Cameco in the area of emergency planning and, in particular, in the *Community Awareness and Emergency Response* (CAER) program, in the *Community Awareness Network* (CAN), and in the training of local fire and police personnel.

The SCC submitted that there is a need for better community education on how to respond in the event of an emergency and how and where to evacuate when necessary. SCC also expressed the view that the community alert system needs to be tested more regularly. In its intervention, the PHCHCC expressed concern about the lack of an adequate buffer zone between the facility and the nearest residential areas in the event of an accident involving a major chemical or

radiological release. The PHNEW also expressed concern over what it considers to be insufficient insurance to address a significant accident at the conversion facility. In response to the Commission's questions about these comments by intervenors, Cameco noted that the emergency plan takes into account the proximity of development and that Cameco carries what it considers to be adequate liability insurance.

The Commission asked questions during the hearing about the integration of Cameco's Emergency Response Plan with those of the neighbouring off-site municipal and provincial plans. In response, CNSC staff reported that Cameco's plan meets all of the CNSC's requirements, including those aspects involving off-site authorities. Mr. N. McKerrell of Emergency Measures Ontario (EMO) added that the Port Hope Emergency Plan is considered acceptable by EMO standards and has received the "Essential" level of achievement under the provincial *Partnerships Towards Safer Communities Program*. Mr. McKerrell also commented on what EMO considers to be a good integration between the Cameco and Port Hope emergency plans and that this achievement is promoted as a model for other municipalities in the province.

4.7.1 Fire Protection

On the matter of fire safety, CNSC staff reported that Cameco has a Fire Safety Plan. CNSC staff noted that a consultant was reviewing the plant with the objective of ensuring the facility complies to the extent possible with the current (1995) *National Fire Code* and *National Building Code*. CNSC staff noted, however, that fire safety at the plant is currently adequate and that follow-up on any items from the consultants review should not preclude consideration of the application for renewal of the operating licence.

CNSC staff pointed out that the five recommended fire-safety licence conditions, which refer to the national fire and building codes, are being proposed for all Class I facility licences.

SCC, in its intervention to the hearing, stated that confirmation of full compliance with the national fire and building codes should be a licence condition.

In response to questions from the Commission on the applicable codes and fire protection improvements underway, CNSC staff explained that it is satisfied with Cameco's actions and plans to address the recommendations of the fire safety inspection. CNSC staff reported that approximately 99% of the improvements will be completed in 2002 and that the remaining improvements that require more significant capital works will be complete in 2004. CNSC staff noted that Cameco is on schedule with the improvements and that CNSC staff do not consider that a further licence condition is necessary at this time to maintain satisfactory progress.

CNSC staff further explained that the current fire and building codes cannot be fully applied retroactively, but will be applied to all future works. CNSC staff also reported that it is currently comparing the CNSC's requirements for fire safety with the US National Fire Protection Association Standard (NFPA) 801 for *Fire Protection for Facilities Handling Radioactive Materials* (1998). Upon conclusion of that review, CNSC staff may decide to impose additional fire protection measures. CNSC staff indicated that it will be consulting Cameco and other fuel

facility licensees on the NPFA-801 beginning in February 2002 and that decisions on any new requirements will likely be made in early summer 2002.

Based on the emergency and fire protection plans currently in place and evolving at the Port Hope Conversion Facility, including the reported high level of coordination and cooperation between Cameco and the local emergency response officials, the Commission concludes that Cameco will continue to make adequate provisions to prepare for, and respond to, potential emergencies associated with the conversion facility operations.

The Commission requires that CNSC staff update the Commission on the status of the fire protection requirements as part of CNSC staff's status report referred to elsewhere in this *Record of Proceedings*. The status report will be presented to the Commission at a public proceeding at the approximate mid-point in the licence term and include, as a guide, those matters identified in the Appendix to CMD 01-H32.A.

4.8 Public Information Program

Cameco explained that its public information program consists of the following activities:

- presentation of quarterly compliance reports to the *Protection to Persons and Property Committee*;
- regular provision of information to the *Environmental Advisory Committee* established by the Port Hope Council, and to the *Port Hope Community Health Concerns Committee*;
- continued support and participation in CAER (Community Awareness and Emergency Response) and the CAN (Community Awareness Network); and
- Periodic facility Open Houses and site tours (most recently on October 27, 2001).

In response to questions from the Commission, the Commission received additional information on the Town of Port Hope Council's restructured *Environmental Advisory Committee*. CNSC staff explained that the Committee meets monthly and consists of nine appointed residents and one councillor. Cameco, however, has been instructed by Council to continue to report to the *Protection to Persons and Property Committee* as noted above. The PHNEW expressed its understanding that Town of Port Hope's new *Environmental Advisory Committee* does not have a mandate for nuclear issues and that the PHNEW considers that it now has this responsibility.

The PHCHCC, PHNEW and SCC expressed the need for greater community involvement in the operation of the nuclear industry in Port Hope. SCC expressed the need for this involvement to be done in a fair, open and objective process. The PHNEW requested that the quarterly compliance reports be sent directly to PHNEW. Both the PHCHCC and SCC noted the need for better public and media access to incident reports and emission data as related to possible health and safety concerns.

In response to the Commission questions on these intervenor comments, Cameco noted that it provides reports to the *Protection of Persons and Property Committee* that those reports and

meetings of the Committee are accessible to the public. Furthermore, Cameco confirmed that the quarterly reports are routinely sent directly to the Chair of the PHNEW.

In response to the Commission's questions about the Open Houses, Cameco reported that the recent Open House was well attended (held on October 27, 2001 and attracted approximately 65 visitors) and that the visitors expressed generally positive comments about the facility and its operation.

The United Steelworkers of America and the Port Hope and District Chamber of Commerce expressed the opinion that Cameco continues to demonstrate a high degree of commitment to its employees and the public, and to the quality of life in the community. In response to the questions of the Commission, those intervenors also reported that, in their day-to-day interactions with the public, they hear no negative comments about Cameco or the effects of the plant on their health.

Based on the above information, the Commission is satisfied that Cameco has an adequate public information program.

4.9 Decommissioning and Financial Guarantees

During the initial part of the hearing, CNSC staff noted that Cameco was expected to submit a revised Preliminary Decommissioning Plan and related financial guarantee prior to the conclusion of the hearing. In its supplementary information to the hearing, CNSC staff confirmed that this information had been received and that it was under review by CNSC staff. CNSC staff indicated its satisfaction with the financial instrument used for the assurance (letter of credit), but that the cost estimate of \$33.8 million, although not appearing unreasonable, still needed detailed review by CNSC staff prior to final acceptance. CNSC staff expressed the opinion that the estimate of \$33.8 million is acceptable in the interim and noted that the amount may be subject to periodic revision by CNSC staff based on such things as changes at the facility and advances in decommissioning and decontamination technologies.

The Commission noted during the hearing that the decommissioning cost estimate was based on the assumption that 150,000 m³ of low-level waste capacity would be available for the decommissioning waste in the federal government's proposed low-level waste project in the Town of Port Hope. In response to the Commission's questions on the reasonableness and reliability of that assumption, Mr. D. McCauley of Natural Resources Canada explained that the 150,000 m³ of waste management capacity formed part of the legal agreement recently signed between the federal government and the municipalities. Cameco added that the estimated decommissioning waste volume requirements are conservative and include a contingency of approximately 40,000 m³. Cameco also confirmed that the dedicated waste management capacity does not include the volume needed for the clean-up of the harbour as that is provided for elsewhere in the waste storage facility design.

In response to questions on the relative timing of the decommissioning and waste management projects, Mr. McCauley of Natural Resources Canada estimated that, assuming a positive

environmental assessment and licensing process, the low-level waste facility could be available to begin receiving waste in 2008, well before the anticipated closure and decommissioning of the Port Hope Conversion Facility. CNSC staff noted, however, that should the planned off-site waste management capacity not materialize, other means of managing the waste would have to be found, including possibly a dedicated on-site repository. CNSC staff explained that it would have sufficient advanced notice of such a need and would take steps to ensure the financial guarantee is appropriately adjusted.

Intervenors to the hearing (PHNEW and SCC) expressed the view that the CNSC should not accept the decommissioning plans and the amount of the financial guarantee without a full public review and assessment by a third party expert.

Cameco noted that some site clean up, including the dismantling and decontamination of obsolete equipment and facilities was initiated in 1996 as part of a progressive operational clean-up prior to the commencement of the formal decommissioning phase. Cameco noted the strong emphasis being placed on material recycling in that activity.

Based on the information provided, the Commission is satisfied with the progress being made by Cameco to address the CNSC's requirements for decommissioning plans and financial guarantees. The Commission is of the opinion that CNSC staff is able to judge the adequacy of the Preliminary Decommissioning Plan and related cost estimates on behalf of the Commission without the need for additional public hearings on the matter. The Commission also considers that CNSC staff may determine if it needs any outside expert assistance in carrying out that review. The Commission also notes that an application for a decommissioning licence by Cameco, including a Detailed Decommissioning Plan, must come to a public hearing before the Commission for a decision prior to the decommissioning of the facility.

4.10 *Canadian Environmental Assessment Act*

CNSC staff expressed the view that a further environmental assessment of the facility operations pursuant to the *Canadian Environmental Assessment Act* (CEAA) is not required due to the fact that a federal environmental assessment of the project had been previously conducted and that the appropriate impact mitigation measures have been substantially implemented. CNSC staff concluded that this enabled the application of provisions of the CEAA *Exclusion List Regulations* (specifically Section 2, of Part I of Schedule I of those regulations).

The SCC, in its intervention, challenged the CNSC staff position on the application of the CEAA, stating that the environmental assessment conducted previously was inadequate and did not include key required elements of an environmental assessment, including a description of the local environment and its sensitivity, the actual effects, the cumulative effects from past operations, and the environmental effects of accidents and malfunctions that may occur.

Based on the information presented, the Commission concurs with CNSC staff's conclusion that a further environmental assessment of the proposed continued operation of the Port Hope conversion facility under the CEAA is not required.

4.11 Licence Term

Cameco applied to the CNSC for the renewal of its operating licence for a period of five years. Previously, the licence term for this facility was two years. CNSC staff recommended that the Commission accept the proposed five-year term on the basis of a number of factors described in CMD 01-H32, one of which was the lack of outstanding, substantial regulatory issues.

During the early stage of the hearing, the Commission requested staff and Cameco to provide a detailed forecast of the changes likely to occur in the facility operations and the regulatory environment during the proposed five-year period. The Commission also requested CNSC staff to consider how the effect of significant foreseeable changes would be brought to the attention of the Commission and the public during the licence period.

In its supplementary information to the hearing, CNSC staff reviewed the status of regulatory issues at the site and recommended that the Commission accept CNSC staff's proposal to report on those issues at a public proceeding of the Commission at approximately the mid-term of the five-year licence (i.e., in approximately 2.5 years). Cameco, in its supplementary information to the hearing also outlined the planned operational changes likely to occur over the next five years.

The PHCHCC and SCC, in their interventions, recommended against a five-year licence term, stating that many significant issues remain outstanding; for example, with respect to environmental monitoring, fire prevention and quality assurance. SCC stressed the view that the Commission should review those issues in a public forum at least every two years.

Based on the information provided, the majority of the Commission Members concluded that a five-year licence term is acceptable. The Commission requires, however, that CNSC staff present a detailed status report to the Commission at the mid-term of the licence period (i.e., in 2.5 years). The Commission further requests that CNSC staff present to the Commission in one year an information report specific to the design and implementation of the environmental effects monitoring program.

Commission Member Dr. C. R. Barnes concurred with the other Members that the licensee meets the requirements of section 24(4) of the NSCA and therefore that a licence should be issued. Dr. Barnes, however, disagreed with the majority view on the duration of the licence term. In Dr. Barnes' view, a maximum licence term of three years should be approved. Dr. Barnes held that a five-year licence should be reserved for facilities where the effects have been demonstrated to be well characterized and where public concerns about health and safety are not high. Dr. Barnes found that a five-year licence in this case would not adequately address the significant remaining concerns of the public about the health effects of the facility in combination with the past uranium contamination in the community. Furthermore, Dr. Barnes was also concerned about the current lack of environmental effects monitoring in the vicinity of the facility. Dr. Barnes is of the view that bringing the matter of the licence renewal before the Commission in three years time, as opposed to a status report, will have a greater influence on ensuring the licensee maintains close attention to the design and implementation of the environmental effects monitoring program and the need to continue to address the significant remaining concerns of the people potentially affected.

5. Conclusion

The Commission has considered the information and submissions of Commission staff 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.

The Commission is of the opinion that the applicant satisfies the requirements of subsection 24(4) of the *Nuclear Safety and Control Act*.

The Commission therefore issues, pursuant to section 24 of the *Nuclear Safety and Control Act*, licence FFOL-3631.0/2007 to Cameco Corporation. The licence will be valid from March 1, 2002 to February 28, 2007, unless suspended, amended, revoked or replaced.

The Commission requests that CNSC staff prepare a status report at the mid-point during the five-year term of the licence (in approximately August 2004). The CNSC staff's status report shall be presented at a public proceeding of the Commission and will provide a detailed summary of the performance of the licensee and facility (as proposed in the Appendix to CMD 01-H32.A), including the results of revised CNSC staff projections of the effects of the Port Hope Conversion Facility on the health and safety of persons and the environment. The status report will be made available in advance of that public proceeding so that licensee and the public have an opportunity to provide comments on the report. The Commission also requests CNSC staff to present an information report to the Commission after one year (in approximately February 2003) on the status of the design and implementation of the environmental effects monitoring program.

Marc A. Leblanc
Secretary,
Canadian Nuclear Safety Commission

Date of decision: January 17, 2002

Date of release of Reasons for Decision: February 18, 2002

Appendix A

Intervenors	Document Number
United Steelworkers of America Local 13173, represented by C. Leavit.	CMD 01-H32.2
Canadian Nuclear Workers Council, represented by P. Falconer and K. Clark.	CMD 01-H32.3
Port Hope Community Health Concerns Committee	CMD 01-H32.4
Port Hope Nuclear Environmental Watchdogs	CMD 01-H32.5
The Corporation of the Town of Deep River	CMD 01-H32.6
The Corporation of the Municipality of Port Hope	CMD 01-H32.7
Port Hope and District Chamber of Commerce	CMD 01-H32.8
Sierra Club of Canada Nuclear Campaign	CMD 01-H32.9