



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant Bruce Power Inc.

Subject Application to Renew the Power Reactor
Operating Licence for the Bruce B Nuclear
Generating Station

Public Hearing Dates December 11, 2008, September 30, 2009 and
October 1, 2009

RECORD OF PROCEEDINGS

Applicant: Bruce Power Inc.

Address/Location: P.O. Box 1540, R.R. #2, Building B10, Tiverton, Ontario, N0G 2T0

Purpose: Application to renew the Power Reactor Operating Licence for the Bruce Nuclear Generating Station B

Application received: July 31, 2008

Dates of public hearing: December 11, 2008, September 30, 2009 and October 1, 2009

Location: Day 1: Ajax Convention Centre, 550 Beck Crescent, Ajax, Ontario
Day 2: CAW Family Education Centre, CAW/Bruce County Road 25, 115 Shipley Ave., Port Elgin, Ontario

Members present: M. Binder, Chair R. J. Barriault
A.R. Graham M. J. McDill
C.R. Barnes A. Harvey

Secretary: K. McGee

Recording Secretary: M. Young

Senior General Counsel: L. Thiele

Applicant Represented By	Document Numbers
<ul style="list-style-type: none"> • D. Hawthorne, President and Chief Executive Officer • R. Fisher, Chief Nuclear Officer • F. Saunders, Vice-President of Safety • K. Ellis, Station Vice-President of Bruce B • C. Horton, Training Manager • T. Kapalilli, Manager Nuclear Safety, Analysis and Support • G. Newman, Chief Engineer 	CMD 08-H30.1 CMD 08-H30.1A CMD 08-H30.1B CMD 08-H30.1C CMD 08-H30.1D
CNSC staff	Document Numbers
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Intervenors	Document Numbers
See appendix A	

Licence: Renewed

Table of Contents

Introduction	1
Decision	2
Issues and Commission Findings	3
Radiation Protection	3
<i>Protection of Workers from Radiation</i>	4
<i>Protection of the Public from Radiation</i>	4
<i>Conclusion on Radiation Protection</i>	4
Environmental Protection	4
<i>Effluent Monitoring</i>	5
<i>Environmental Monitoring</i>	6
<i>Conclusion on Environmental Protection</i>	7
Operating Performance	7
<i>Organization and Plant Management</i>	7
<i>Conduct of Operations</i>	8
<i>Occupational Health and Safety</i>	8
<i>Conclusion on Operating Performance</i>	9
Design and Analysis	9
<i>Safety Analysis</i>	10
<i>Safety Issues Program</i>	12
<i>Design</i>	13
<i>Conclusion on Design and Analysis</i>	13
Equipment Fitness for Service	14
<i>Maintenance</i>	14
<i>Structural Integrity</i>	15
<i>Reliability</i>	16
<i>Environmental Qualification</i>	16
<i>Conclusion on Equipment Fitness for Service</i>	17
Emergency Preparedness and Fire Protection	17
<i>Emergency Preparedness</i>	17
<i>Fire Protection</i>	18
<i>Conclusion on Emergency Preparedness and Fire Protection</i>	20
Performance Assurance	20
<i>Quality Management</i>	21
<i>Training, Examination and Certification</i>	23
<i>Conclusion on Performance Assurance</i>	24
Public Information Program	24
Security	25
Non-Proliferation and Safeguards	25
Decommissioning Plans and Financial Guarantee	26
Application of the Canadian Environmental Assessment Act	27
Licence Length and Conditions	28
Conclusion	30

Introduction

1. Bruce Power Inc. (Bruce Power) has applied to the Canadian Nuclear Safety Commission¹ (CNSC) for the renewal of the power reactor operating licence (PROL) for its Bruce Nuclear Generating Station (NGS) B (Bruce B) located in the municipality of Kincardine, Ontario. The current operating licence, PROL 16.16/2009, expires on October 31, 2009. Bruce Power has applied for the renewal of this licence for a period of five years.
2. The Bruce NGS B nuclear facility comprises four 904-megawatt Canada Deuterium Uranium (CANDU) reactors and their associated equipment (Unit 5, Unit 6, Unit 7 and Unit 8). The separately licensed Bruce NGS A, consisting of four similar reactor units, is located immediately adjacent to Bruce B. Both Bruce B and the separately licensed Bruce NGS A, consisting of four similar reactor units, are located on the Bruce Nuclear Power Development site. The NGSs are both owned by Ontario Power Generation Inc. (OPG) and have been operated by Bruce Power under a lease agreement since 2001. In addition to the Bruce A and Bruce B NGSs, the Bruce Nuclear Power Development site includes two waste management facilities, owned and operated by OPG, and Atomic Energy of Canada Limited's (AECL) demonstration Douglas Point reactor, which is currently being decommissioned.
3. CNSC staff has proposed a new licence format for the Bruce B licence. The new licence format incorporates the use of a licence condition handbook (LCH) and is meant to strengthen regulatory oversight, increase regulatory effectiveness and efficiency, and reduce administrative efforts.

Issue

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

¹ The *Canadian Nuclear Safety Commission* is referred to as the "CNSC" when referring to the organization and its staff in general, and as the "Commission" when referring to the tribunal component.

² Statutes of Canada (S.C.) 1997, chapter (c.) 9.

Public Hearing

5. Pursuant to section 22 of the NSCA, the President of the Commission established a Panel of the Commission to review the application. The Commission, in making its decision, considered information presented for a public hearing held on December 11, 2008 in Ajax, Ontario and September 30, 2009 and October 1, 2009 in Port Elgin, Ontario. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*³. During the public hearing, the Commission considered written submissions and heard oral presentations from CNSC staff (CMD 08-H30, 08-H30.A, 08-H30.B, 08-H30.C, 08-H30.D and 08-H30.E) and Bruce Power (CMD 08-H30.1, 08-H30.1A, 08-H30.1B, 08-H30.1C and 08-H30.1D). The Commission also considered oral and written submissions from 10 intervenors (see Appendix A for a detailed list of interventions).
6. Following Day 1 of the hearing, Bruce Power was granted a 7-month licence extension for the Bruce A and Bruce B licences, which were set to expire on March 31, 2009, to October 31, 2009. This extension was granted in order to provide more time for the Commission, the applicant and members of the public who wished to intervene to comment on CNSC staff's proposed licence format and the LCH, and to consider Bruce Power's application to re-load fuel in Bruce NGS A Units 1 and 2.
7. At Day 2 of the hearing, the Saugeen Ojibway Nations requested that the Commission adjourn the hearing in order to consider further information regarding safety analysis. The Commission considered this request and concluded that it feels that it has sufficient information to make a decision on this matter and therefore decided not to adjourn the hearing.

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 concludes that Bruce Power is qualified to carry on the activities that the licence will authorize. The Commission is of the opinion that Bruce Power, in carrying on these activities, will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed. Therefore,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews the power reactor operating licence issued to Bruce Power Inc. for its Bruce Nuclear Generating Station B located in the municipality of Kincardine, Ontario. The renewed licence, PROL 16.00/2014, is valid from November 1, 2009 to October 31, 2014.

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

9. The Commission includes in the licence the conditions as recommended by CNSC staff and set out in the draft licence attached to CMD 08-H30.D.
10. With this decision, the Commission requests that CNSC staff submit a separate report containing detailed information on the status of Bruce Power's environmental follow-up monitoring program regarding whitefish, the status of ageing management, any safety-significant dates for equipment, any forecasted end of life plans for Bruce B and the status of the LCH at the same time as CNSC staff presents its annual Integrated Safety Assessment of Canadian Nuclear Power Plants. CNSC staff shall present its separate report at a public proceeding of the Commission in approximately June of each year. The Commission notes that the public will have an opportunity to provide written comments on this report. In addition, the Commission directs CNSC staff to provide an update to the Commission with respect to any significant developments regarding emissions from Bruce Power's fire training facility.

Issues and Commission Findings

11. In making its licensing decision, the Commission considered a number of issues relating to Bruce Power's qualification to carry out the proposed activities and the adequacy of the proposed measures for protecting the environment, the health and safety of persons, national security and international obligations to which Canada has agreed.

Radiation Protection

12. As part of its evaluation of the adequacy of the provisions for protecting the health and safety of persons, the Commission considered the past performance of Bruce Power in the area of radiation protection.
13. Bruce Power provided information about its radiation protection program. Bruce Power stated that it completed several dose reduction and dose control initiatives during the licence period of 2003 to 2009, including the reduction of unplanned exposures and the reduction of tritium hazard levels. Bruce Power also provided information regarding its planned initiatives for the proposed five-year licence period, including improved systems, new equipment, implementing lessons learned, and increasing the availability and use of temporary shielding.
14. Bruce Power stated that it provided CNSC staff with a revised radiation protection program in July 2009. CNSC staff stated that the revised program covers all elements of an effective radiation protection program.
15. CNSC staff stated that both Bruce Power's radiation protection program and its implementation met requirements over the licence period.

Protection of Workers from Radiation

16. Bruce Power stated that no doses to workers exceeded the prescribed dose limits of 50 millisieverts (mSv) in one year or 100 mSv over 5 years. Bruce Power stated that the maximum annual occupational dose to a worker on the Bruce site was 26.6 mSv in 2005. Bruce Power noted that one action level was exceeded in October 2008. Bruce Power stated that it completed dose reduction and control initiatives during the licence period and has a five-year dose reduction improvement plan. Bruce Power explained that it applies the ALARA (As Low As Reasonably Achievable) principle, including limiting exposure time and having appropriate distance and shielding.
17. CNSC staff stated that it conducted several inspections over the licence period. CNSC staff stated that Bruce Power has identified corrective actions for areas where improvement is needed, and CNSC staff finds these corrective actions to be acceptable.
18. The Commission sought further information regarding the increasing trend in doses to workers in the information provided by Bruce Power. Bruce Power responded that the increasing trend is due to the nature of the work performed during each year. Bruce Power explained that different tasks are performed during each year and the doses will vary because of this.

Protection of the Public from Radiation

19. CNSC staff reported that the highest estimated radiation dose to the public from the Bruce site was 2.07 microsieverts per year ($\mu\text{Sv}/\text{y}$), which is well below the public dose limit of 1000 $\mu\text{Sv}/\text{y}$ (or 1 mSv/y).

Conclusion on Radiation Protection

20. Based on the information provided, the Commission concludes that adequate provisions are in place at the Bruce B site to provide acceptable protection to workers and the public from radiation during the operation of the facility.

Environmental Protection

21. Bruce Power provided information regarding its environmental protection performance over the licence period. Bruce Power stated that it has a comprehensive program in place to ensure that the environmental impact of the facility is controlled and monitored. Bruce Power stated that its Environmental Management System conforms to the ISO 14001-2004 “Environmental Management Systems” standard and CNSC Regulatory Document S-296⁴.

⁴ Regulatory Document S-296 “Environmental Protection Policies, Programs and Procedures at Class I Nuclear Facilities and Uranium Mines and Mills”, March 2006.

22. CNSC staff stated that both Bruce Power's Environmental Protection program and its implementation met requirements over the licence period.
23. CNSC staff stated that it conducted several inspections over the licence period and noted that all of the issues raised from these inspections were satisfactorily addressed.

Effluent Monitoring

Air Emissions

24. CNSC staff stated that the Derived Release Limit (DRL) is the theoretical quantity of a nuclear substance released in a year that would result in a committed effective radiation dose of 1 mSv to the most exposed group of the public (also known as the critical receptor) for that nuclear substance. CNSC staff noted that the DRL, along with Action Levels and Internal Investigation Levels, is a tool for judging ongoing compliance with the annual public dose limit, as well as the requirements to control releases and keep exposure ALARA.
25. Bruce Power stated that it conducts stack monitoring for air releases, and monitors airborne emissions, including tritium, iodine, particulates, noble gases and carbon-14. Bruce Power stated that its releases are less than one percent of the DRL for the facility. CNSC staff concurred that the releases to air were well below the DRL and action levels for the facility.
26. Bruce Power noted that there was an increase in air emissions from the Bruce site over the licence period, which was attributed to the restarts of Units 3 and 4 for Bruce A. Bruce Power stated that it is developing emission reduction strategies.
27. The Commission inquired as to the reason that Bruce A and B have different DRLs. CNSC staff responded that the difference is related to the calculation of the DRL for each facility. CNSC staff explained that the DRL calculation involves several factors, including the location of the facility in relation to the critical receptor and the environmental pathways to critical receptor (including air, water, vegetation, etc.). CNSC staff noted that although the DRLs are different for the two facilities, they both correspond to a dose of 1 mSv/y to the critical receptor.

Water Emissions

28. Bruce Power stated that it monitors waterborne emissions, including tritium, gross gamma radiation and carbon-14. Bruce Power stated that its releases are less than one percent of the DRL for the facility. CNSC staff concurred that the releases to water were well below the DRL and action levels for the facility.

Releases of Hazardous Substances

29. CNSC staff stated that releases of hazardous substances meet local, provincial and federal requirements. CNSC staff noted that all reportable infractions of the Certificate of Approval issued by the Ontario Ministry of the Environment (MOE) were communicated to CNSC and appropriate corrective actions taken in each case. CNSC staff noted that no follow-up actions were required.

Environmental Monitoring

30. Bruce Power stated that its total plant emissions for specified contaminants are submitted to Environment Canada and the MOE. Bruce Power stated that unplanned releases from Bruce B were reported to the MOE, and a spill prevention plan implemented as corrective measure.
31. The Commission sought further information regarding the spill prevention plans. Bruce Power stated that the plans are complete, and Bruce Power is currently in the process of minimizing the gaps in the plan. Bruce Power noted that the program will be continuously updated and ongoing. CNSC staff stated that adequate controls are in place for spills and that Bruce Power has responded adequately.
32. One intervenor expressed concerns about the impact of the facility on the alewife and smelt populations of Lake Huron. The Commission sought further information on this matter. CNSC staff stated that the declining population of these fish, which are non-native to Lake Huron, is not due to the facility. CNSC staff explained that the fish loss due to the facility is on the order of 0.01%, which is not a large enough fraction of the population to cause a decline. CNSC staff further explained that the decline has been caused by changes in the food web due to zebra mussels, as well as predation from wild Chinook salmon. CNSC staff noted that the fish community in Lake Huron is in flux, and species native to Lake Huron are coming back. Bruce Power noted that it will further monitor the situation.
33. The Saugeen Ojibway Nations, in its intervention, questioned the adequacy and effectiveness of the sampling and analysis of the environmental assessment follow-up program for the Bruce NGS A restart with respect to the impact of the Bruce Power facility on the whitefish population of Lake Huron. The Saugeen Ojibway Nations requested further information on this issue, including fish intake losses. The Commission sought further information on this matter. Bruce Power stated that it has a responsibility to monitor the whitefish population as an aspect of the follow-up program for the Bruce NGS A restart project. Bruce Power noted that there is a need to characterize the population of whitefish in the lake and Bruce Power is willing to participate in such a project. Bruce Power stated that it will provide the Commission with annual updates on its progress in meeting the requirements of its follow-up monitoring program.

Conclusion on Environmental Protection

34. Based on the provided information, the Commission is satisfied that facility operations are effectively controlled with the Environmental Protection Program and mitigation measures in place, and that the health and safety of persons and the environment are adequately protected.
35. The Commission directs CNSC staff and Bruce Power to continue to work with the Saugeen Ojibway Nations in order to address the Saugeen Ojibway Nations' concerns regarding the whitefish follow-up monitoring as expeditiously as possible. The Commission is satisfied that the follow-up monitoring program is in place, but the Commission is of the opinion that Bruce Power and CNSC staff must improve their communications with the Saugeen Ojibway Nations.

Operating Performance

36. The Commission considered the operating performance at Bruce B as an indication of Bruce Power's qualifications to continue to safely operate the facility and, in doing so, provide adequate protection for the environment and the health and safety of persons. The areas of operating performance that the Commission examined encompassed aspects of organization and plant management, conduct of operations, and occupational (non-radiological) health and safety.
37. CNSC staff stated that Bruce Power's overall Operating Performance met requirements over the licence period of 2003 to 2009.

Organization and Plant Management

38. Bruce Power provided information regarding organization and plant management. Bruce Power stated that it has increased its operational focus within the company and introduced and implemented improvements in organizational structure, leadership, processes and programs. Bruce Power described the improvement initiatives that it completed during the licence period, including the implementation of a modern documentation system, and provided information regarding its improvement plans for the proposed licence period.
39. CNSC staff stated that the Bruce Power organization has been adjusted and continues to evolve. CNSC staff noted that Bruce Power is actively hiring new staff and is managing its training and qualification process appropriately. CNSC staff stated that it and Bruce Power continue to discuss the requirements for the minimum shift complement at the facility. CNSC staff explained that although adequate staffing is maintained and safe operation has been assured, there are isolated cases where an insufficient number of staff is available. CNSC staff noted that the minimum complement requirements were exceeded in all CNSC control room inspections. CNSC staff stated that the minimum shift complement requirements are explicitly stated in Appendix A of the proposed licence.

40. CNSC staff provided information regarding transients (unplanned changes in reactor power). CNSC stated that the number of transients has decreased over the licence period and meets the accepted target of one transient per 7000 hours of operation. CNSC staff further stated that there were no component failures or other complications resulting from initial transients, and maintenance has been completed to an acceptable level to ensure reliable operation of systems and components. CNSC staff also provided information regarding Bruce Power's internal review and self-assessment.
41. CNSC staff stated that Bruce Power's organization and plant management met requirements over the licence period.

Conduct of Operations

42. Bruce Power provided information regarding its conduct of operations. Bruce Power stated that it made improvements to its operations group, including efforts in training on human performance tools, training on operations fundamentals and performance monitoring. Bruce Power stated that as a result of its improvements, the number of challenges for its operations group have decreased. In addition, Bruce Power stated that its organizational changes have resulted in clearly-defined roles and responsibilities for operations staff.
43. CNSC staff stated that both Bruce Power's Operations program and its implementation met requirements over the licence period of 2003 to 2009. CNSC staff stated that it conducted various operational inspections over the licence period to verify that the systems, structures and components in the facility continue to operate as required. CNSC staff reported that it observed improved processes to deal with issues and correct past problems, and items affecting safety are dealt with in a timely manner.
44. CNSC staff provided information regarding outages. CNSC staff stated that Bruce Power met requirements for outage planning, execution and work completion. CNSC staff noted that safety is given sufficient priority when a system, structure or component fails.
45. Regarding events, CNSC staff reported that there were no serious process failures or potential serious process failures during the licence period. CNSC staff stated that all reportable events were reported according to the requirements set out in Regulatory Guide S-99⁵. CNSC staff stated that it was satisfied with Bruce Power's response to events.

Occupational Health and Safety

46. Bruce Power provided information regarding its performance in the area of Occupational Health and Safety. Bruce Power stated that it has a very low accident frequency, and its performance regarding lost time accidents is better than average for operating reactors worldwide.

⁵ Regulatory Document S-99, "Reporting Requirements for Operating Nuclear Power Plants", March 2003.

47. CNSC staff stated that Bruce Power's occupational health and safety program met requirements over the licence period, and the implementation of the program exceeded requirements. CNSC staff stated that Bruce Power subscribes to the International Safety Ranking System and is planning to transition to the OHSAS 18001 "Occupational Health and Safety Management Systems – Specification" standard. CNSC staff noted that the provincial Ministry of Labour, which has jurisdiction in this safety area, has stated that Bruce Power's performance meets requirements.
48. Bruce Power stated that it has implemented improvements in the area of Occupational Health and Safety, including asbestos inventory and a hazardous material acquisition process. Bruce Power stated that it benchmarks industrial safety manuals and is making progress towards certification of OHSAS 18001.
49. The Commission sought further information regarding Bruce Power's occupational health and safety program. Bruce Power stated that it uses the International Safety Rating System to identify and remove hazards from the workplace, and in the event of medically treated events, workers are accommodated so there is no lost time. Bruce Power further stated that a physiotherapist is currently employed at the facility and that its future plans include doctor recruitment programs.
50. The Commission inquired about the inclusion of occupational health and safety in the LCH. CNSC staff responded that the LCH includes requirements for employee fitness for duty and certified staff oversight requirements. Bruce Power responded that the Canadian nuclear utilities have convened to create fitness for duty guidelines, which will be finalized in November 2009, and will be used to develop policies and programs.

Conclusion on Operating Performance

51. The Commission is satisfied that the health and safety of workers and the public was adequately protected during the operation of the facility for the current licence period, and that the health and safety of persons will also be adequately protected during the continued operation of the facility.
52. Based on its consideration of the presented information, the Commission concludes that Bruce Power has appropriate organization and management structures in place, and that the operating performance at the facility provides a positive indication of Bruce Power's ability to adequately carry out the activities under the proposed licence.

Design and Analysis

53. The Commission examined issues related to the program areas of Safety Analysis, Safety Issues and Design in order to assess the adequacy of the safety margins provided by the design of the facility.

54. CNSC staff stated that both Bruce Power's Design and Analysis program and its implementation met requirements over the licence period.

Safety Analysis

55. Bruce Power provided information regarding safety analysis. Bruce Power stated that it routinely carries out safety analyses to confirm that any plant design changes will not result in a reduction in plant safety. Bruce Power stated that probabilistic safety assessments (PSAs) are performed to identify and manage all important contributors to plant safety.
56. Bruce Power stated that it provides an updated safety report to CNSC staff every three years. Bruce Power noted that the safety report includes the results of the safety analysis program.
57. CNSC staff stated that it has completed a review of the updated safety report submitted in 2006. CNSC staff stated that existing safety margins and analysis results need to be reconfirmed. CNSC staff noted that Bruce Power has proposed a strategy for safety report improvement.
58. CNSC staff stated that there is a need to improve the safety margins for a large break loss of coolant accident (LBLOCA) for the Bruce A and Bruce B reactors. CNSC staff explained that the need arose due to a design feature of CANDU reactors, which have a positive void reactivity feedback, and the original safety analysis, which under-predicted the consequences of this event. CNSC staff stated that while the regulatory requirements continue to be met for this event, the demonstrated safety margins have been reduced.
59. CNSC staff stated that Bruce Power's proposed program to improve LBLOCA safety margins has been reviewed and accepted by CNSC staff. CNSC staff noted that Bruce Power has suspended its proposal of using low-void reactivity fuel as a solution.
60. CNSC staff provided additional information related to safety analysis. CNSC staff stated that Bruce B has adequate capacity to dissipate the decay heat in the event of a sustained loss of normal operational heat sinks.
61. CNSC staff provided information concerning the Safe Operating Envelope (SOE), which is the set of operating limits and conditions within which the NGS must be operated to ensure conformance with the safety analysis. CNSC staff stated that Bruce Power has submitted an action plan to revise the SOE, and CNSC staff is satisfied with Bruce Power's progress.
62. CNSC staff stated that the safety case for Bruce B is not in question, due to the degree of conservatism in the safety analysis. CNSC staff noted that the reactors are currently limited (de-rated) to operating at 92.5% of full power, which provides an adequate safety margin.

63. The Commission sought further information regarding a clause in the LCH that refers to changes to the SOE. CNSC staff responded that although the SOE can be changed in a manner that reduces the safety margins, as long as the safety margins continue to be above requirements, the change will not impact the safe operation of the facility. CNSC staff noted that if a proposed change to the SOE would result in the safety margins being below requirements, it would have to be approved by the Commission.
64. The Commission requested further information regarding accident scenarios involving LBLOCA and Neutron Overpower (NOP) analysis. Bruce Power responded that the two events are linked, and the correction of de-rating the units provides an adequate safety margin. CNSC staff stated that these and other accident scenarios are evaluated in order to establish the SOE.
65. Several intervenors, including the Saugeen Ojibway Nations and Greenpeace Canada (Greenpeace), expressed concerns regarding the positive void reactivity coefficient and LBLOCA. The intervenors noted that with the suspension of the low-void reactivity fuel program, Bruce Power must further demonstrate that it will resolve the issue. The Commission sought further information from CNSC staff on this matter. CNSC staff responded that Bruce Power plans to implement enhancements to the shutdown systems to address this issue and stated that as long as the issue is not resolved, the facility will remain de-rated. CNSC staff stated that it is absolutely confident that adequate safety margins are being maintained.
66. Intervenors, including Greenpeace and the Canadian Coalition for Nuclear Responsibility, expressed concerns regarding accident scenarios such as a double-ended pipe break or a terrorist attack. CNSC staff responded that these and other accident scenarios are considered as part of the design basis for the facility or in the severe accident management program for the facility, and the plant operates at all times within an analyzed safety assessment. CNSC staff further stated that it and Bruce Power are continuously reviewing the safety analysis with the latest codes and standards to ensure that the safety margins are maintained.
67. Regarding plant ageing, CNSC staff stated that Bruce Power has developed and begun implementing an ageing management program. CNSC staff stated that the ageing management program will be incorporated into the safety analyses once 'phase 3' of the program, which includes the assessment of the impact of ageing on the performance of the special safety systems under accident conditions, is completed. CNSC staff stated that safe operation over the proposed licence period through 2014 will be supported through phase 3. CNSC staff stated that it will continue to monitor these developments, as well as assessing the impact of plant ageing on all design basis events.

68. Greenpeace, in its intervention, expressed concerns regarding the design of the facility. Greenpeace stated that, based on the age of the facility, an end of life plan for Bruce B should be developed during the proposed licence period for the next licence renewal application in 2014. The Commission sought further information in this regard. CNSC staff responded that the concept of end of life is not concrete and that the safety aspect is covered by ageing management. CNSC staff explained that upgrades and maintenance can extend the operating life of a facility, provided that safety is maintained. CNSC staff further stated that it will be revising regulatory document RD-360⁶ to include the need for planning. Bruce Power responded that it must justify the operation of every unit from each two-year operating cycle to the next, and that Bruce Power is required to have ageing management programs and standards, and to update standards, codes, analyses and life cycle assumptions for safety related components. The Commission expects Bruce Power and CNSC staff to provide information regarding the status of ageing management, any safety-significant dates for equipment, and any forecasted end of life plans for Bruce B in the context of CNSC staff's annual Integrated Safety Assessment of Canadian Nuclear Power Plants during the licence period.
69. CNSC staff stated that the safety analysis program area meets requirements and the implementation of this program area met requirements over the licence period. The Commission is satisfied with CNSC staff's assessment that adequate safety margins are being maintained.

Safety Issues Program

70. CNSC staff stated that the safety issues program area relates to the identification and resolution of safety-related concerns arising from operational experience, analysis, research and incorporation of new knowledge or requirements. CNSC staff noted that a safety-related concern that cannot be resolved based on current knowledge is referred to as an outstanding safety issue. CNSC staff further noted that an outstanding safety issue that is common to more than one station and complex in nature is referred to as a Generic Action Item (GAI). CNSC staff stated that it discussed the industry-wide approach to GAIs at the June 2008 Commission public meeting, when it presented the "Annual CNSC Staff Report for 2007 on the Safety Performance of the Canadian Nuclear Power Industry" (CMD 08-M37)⁷.
71. CNSC staff stated that six GAIs pertaining to Bruce Power remain open. CNSC staff noted that Bruce Power has requested the closure of five and CNSC staff is reviewing Bruce Power's request. CNSC staff stated that Bruce Power's overall progress towards the resolution of GAIs, including participation in industry efforts, was satisfactory.

⁶ Regulatory Document RD-360, "Life Extension of Nuclear Power Plants", February 2008.

⁷ Minutes of the CNSC Meeting held Thursday, June 21, 2007.

72. CNSC staff stated that Bruce Power's safety issues program area meets requirements in both the program documentation and the implementation of the program.

Design

73. Bruce Power provided information regarding its design program. Bruce Power stated that it completed several significant projects over the licence period, including seismic upgrades and fire protection upgrades, and other projects are currently in progress. Bruce Power stated that it has made significant progress in addressing legacy issues. Bruce Power noted that it has several initiatives planned for the proposed licence period, including a commitment to follow CSA standard N285.0-08⁸ for pressure boundaries.
74. CNSC staff stated that both the design program documentation and its implementation met requirements over the licence period. CNSC staff noted that although the implementation currently meets requirements, there is a deteriorating trend due to the identified weaknesses in the maintenance of records and analysis at Bruce B, and the lack of progress in closing out legacy fire protection design issues over the licensing period.
75. CNSC staff provided information regarding pressure boundaries. CNSC staff stated that Bruce B has legacy issues concerning configuration management. CNSC staff explained that documentation has not been maintained to reflect the current plant status. CNSC staff noted that Bruce Power has provided a corrective action plan to address this issue.
76. CNSC staff also provided information regarding several other design areas. CNSC staff stated that main steam piping improvements were implemented to enhance structural integrity to meet dynamic loads. CNSC staff also stated that a 2006 electrical distribution system functional inspection resulted in 19 action notices being raised. CNSC staff noted that Bruce Power has provided a response and closed nine of the action items in January 2008.

Conclusion on Design and Analysis

77. On the basis of the information presented, the Commission concludes that the design of Bruce B is adequate for the operation period included in the proposed licence. The Commission is of the view that, although there are action items still open, the risks associated with these items are reasonable. The Commission is satisfied that adequate safety margins are being maintained.

⁸ CSA N285.0-08, General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants, 2008

78. Furthermore, the Commission is of the view that Bruce Power's planned activities to improve the implementation of its programs related to Design and Analysis are necessary for the ongoing operation of Bruce B. The Commission notes that while it is satisfied with the status of the implementation of programs related to Design and Analysis for the purpose of the proposed licence renewal, it expects any deficiencies to be corrected in a timely and efficient manner. The Commission expects that CNSC staff will continue to monitor Bruce Power's progress in this regard.
79. Based on the information before it, the Commission concludes that facility operations are effectively controlled with the safety programs in place and that the health and safety of persons, the environment and national security is adequately protected.

Equipment Fitness for Service

80. CNSC staff explained that Equipment Fitness for Service is comprised of four program areas:
- Maintenance;
 - Structural Integrity;
 - Reliability; and
 - Environmental Qualification.
81. CNSC staff reported that Bruce Power's overall Equipment Fitness for Service program area meets requirements in both the program documentation and the implementation of the program. CNSC staff noted that overall there has been little change over the licence period.

Maintenance

82. Bruce Power provided details concerning the results of its maintenance program. Bruce Power stated that it continues to advance in its strategy of reducing maintenance backlogs, increasing equipment availability and reliability and developing a proactive maintenance program
83. CNSC staff reported that Bruce Power's maintenance program area meets requirements in the program documentation, but is below requirements for the implementation of the program. CNSC staff noted that overall there was a deteriorating trend over the licence period, which resulted in Bruce Power being below requirements. CNSC staff noted that there is now an improving trend due to the reduction of the corrective maintenance backlog.
84. The Commission sought further information regarding maintenance backlog tracking. CNSC staff responded that it tracks maintenance backlogs through its inspections process. CNSC staff noted that it would provide updates to the Commission on this matter during annual reporting. CNSC staff further noted that it expects to see sustained improvement on this matter. Bruce Power stated that it is confident that it can continue to improve.

85. The Commission inquired about the move to planned outages every 36 months from every 18 months. Bruce Power responded that the move to longer operating spans between outages allows more ‘online’ time to focus on reducing maintenance backlogs. CNSC staff noted that this is becoming standard practice, and CNSC staff will continue to provide oversight.

Structural Integrity

86. Bruce Power stated that its equipment ageing management process is governed by the “Plant Reliability Integration” program. Bruce Power explained that engineers implement monitoring and periodic inspection programs for systems, structures and components. Bruce Power stated that it follows best practices and available CSA standards. Bruce Power further stated that its Life Cycle Management Plans (LCMPs) have been completed for major reactor components. Bruce Power noted that additional LCMPs will be completed by the end of 2009. Bruce Power further noted that station-specific plant health committees have been established to provide oversight.
87. CNSC staff reported that Bruce Power’s Structural Integrity program area meets requirements in both the program documentation and the implementation of the program. CNSC staff noted that overall there has been little change over the licence period.
88. CNSC staff presented its assessment of Bruce Power’s implementation of the structural integrity program area, which includes the following programs:
- Pressure Boundary Program;
 - Periodic Inspection Program for Containment Structures and Components;
 - Periodic Inspection Program for CANDU Nuclear Power Plant Components;
 - Steam Generator Tube and Preheater Tube Aging Management Program;
 - Fuel Channel Fitness for Service Program;
 - Feeder Pipe Ageing Management Program;
 - Relief Valve Testing Program; and
 - Conventional Piping Wall Thinning Inspection Program.
89. CNSC staff stated that it was satisfied with Bruce Power’s performance in all areas. CNSC staff noted that Bruce Power plans to make improvements in several areas, such as minimizing steam generator tube exposure to oxidizing conditions and updating to new inspection program standards. CNSC staff stated that Bruce Power has committed to updating its periodic inspection programs to meet the requirements of new CSA standards, including CSA N287.7-08⁹ for containment structures and CSA N285.5-08 for pressure-retaining systems. CNSC staff further stated that Bruce Power has committed to implementing an enhanced integrated ageing management program by October 2009.

⁹ CSA N287.7-08, In-service examination and testing requirements for concrete containment structures for CANDU nuclear power plants, 2008

90. CNSC staff stated that a steam generator tube leak in Unit 8 was identified in November 2007. CNSC staff added that Bruce Power addressed the leak, and that CNSC staff is satisfied with Bruce Power's response to the issue. CNSC staff noted that the issue is not considered to be a significant risk to steam generator operations, and that the degradation of the tube support plates in the Unit 8 steam generators is within predicted and acceptable levels.

Reliability

91. Bruce Power stated that it has a robust program of monitoring, testing, data collection and evaluation to ensure that safety-related systems are available and function properly. Bruce Power added that it meets the requirements of CNSC standard S-98 "Reliability Programs for Nuclear Power Plants" and that it has committed to transition to the new CNSC standard S-294¹⁰ "Probabilistic Safety Assessment" for operating units and refurbishment projects by June 2011.
92. CNSC staff reported that Bruce Power's reliability program area meets requirements in both the program documentation and the implementation of the program. CNSC staff noted that overall there has been little change over the licence period. CNSC staff stated that it has reviewed and accepted Bruce Power's improvement plans to upgrade its probabilistic safety assessments.
93. CNSC staff provided details concerning its oversight of the implementation of Bruce Power's reliability program. CNSC staff stated that Bruce Power has made progress in addressing the deficiencies in Bruce Power's process to collect and treat reliability data identified in a 2005 inspection. CNSC staff further stated that Bruce Power's testing program for safety systems demonstrates that they are reliable and comply with targets.
94. CNSC staff stated that Bruce B experienced some instances of poor performance of systems important to safety caused by human error or poor maintenance. CNSC staff noted that Bruce Power has implemented corrective actions to address these issues.

Environmental Qualification

95. CNSC staff explained that the environmental qualification program area relates to plant-specific functional and performance requirements that ensure that systems, structures and components are suitable for operation under extreme environmental conditions resulting from design basis accidents.
96. CNSC staff reported that Bruce Power's environmental qualification program area meets requirements in both the program documentation and the implementation of the program. CNSC staff noted that overall there has been little change over the licence period.

¹⁰ CNSC standard S-294 "Probabilistic Safety Assessment (PSA) for Nuclear Power Plants", April 2005.

97. CNSC staff stated that it reviewed Bruce Power's performance related to environmental qualification, seismic qualification and fire protection. CNSC staff stated that a 2005 inspection concluded that Bruce B is environmentally qualified. CNSC staff noted that, as a result of the inspection, CNSC staff issued several action notices and recommendations to Bruce Power in order to sustain environmental qualification. CNSC staff stated that Bruce Power has responded to the inspection findings.

Conclusion on Equipment Fitness for Service

98. The Commission is satisfied with Bruce Power's programs for the inspection and life-cycle management of key safety systems. Based on the above information, the Commission concludes that the equipment as installed at the facility is fit for service.

Emergency Preparedness and Fire Protection

Emergency Preparedness

99. Bruce Power provided information regarding its preparedness planning and the capability of its emergency response organizations to respond to simulated emergencies. Bruce Power described its Emergency Measures Program, which encompasses communications, planning and task execution, an emergency operations centre, drill conduct and evaluation, crisis management, and weather forecasting.
100. Bruce Power also provided information regarding its planned initiatives for the proposed licence period, including implementing a Command and Control system, improving the realism in emergency preparedness, installing backup communications, and developing business cases to obtain funding for a customized emergency facility and remote gamma monitoring systems.
101. CNSC staff reported that Bruce Power's emergency preparedness program exceeds requirements in both the program and the implementation of the program. CNSC staff noted that overall there has been little change over the licence period.
102. CNSC staff stated that Bruce Power has a mature Nuclear Emergency Plan that meets the requirements of CNSC regulatory guide G-225¹¹. CNSC staff stated that it reviewed Bruce Power's quarterly reports of performance indicators used to evaluate the implementation of the emergency preparedness program and had no significant findings. CNSC staff further stated that it conducted several inspections of Bruce Power's emergency exercises and Bruce Power's performance exceeded expectations.

¹¹ CNSC Regulatory Guide G-225 "Emergency Planning at Class I Nuclear Facilities and Uranium Mines and Mills", August 2001.

Fire Protection

103. Bruce Power provided information regarding its fire protection measures. Bruce Power stated that it completed design and construction improvements during the licence period, including sprinkler system upgrades, the installation of a fire detection network system, and improvements to suppression and detection, and fire water supply and diversity.
104. Bruce Power stated that it has several initiatives planned for the proposed licence period, including fire alarm upgrades, fire barrier upgrades, additional suppression and detection improvements, and replacement of obsolete equipment. In addition, Bruce Power stated that it has a plan to transition to the new CSA standard N293-07¹².
105. CNSC staff stated that it conducted a comprehensive review of Bruce Power's fire protection program in 2008. CNSC staff stated that the fire protection program meets requirements but several code non-compliances remain outstanding.
106. CNSC staff stated that the Fire Hazard Assessment and Fire Safe Shutdown Analysis have not been maintained to reflect the current plant configuration, and the original scope of these analyses did not cover all plant areas. In addition, CNSC staff noted that third-party reviews are required for building modifications that have the potential to impact fire protection. CNSC staff stated that Bruce Power has set target completion dates to correct the outstanding issues and CNSC staff considers these dates to be acceptable. CNSC staff noted that it will conduct additional reviews to determine the adequacy of the corrective actions. CNSC staff further noted that Bruce Power will revise the existing Fire Hazard Assessment and Fire Safe Shutdown Analysis during the proposed licence period.
107. In addition, CNSC staff stated that Bruce Power had several procedural non-compliance incidents over the licence period. CNSC staff explained that the majority of these incidents were related to housekeeping, public-address speaker impairments, and inspection testing and maintenance of fire protection systems. CNSC staff stated that regulatory action was required to compel Bruce Power to address combustible material storage.
108. CNSC staff stated that despite the non-compliances over the licence period, Bruce Power has shown a concentrated effort in addressing the issues. CNSC staff noted that further improvements are required in follow-up actions to prevent reoccurrence of similar events.
109. CNSC staff stated that Bruce Power's fire emergency response is in compliance with requirements and is adequate to maintain an acceptable level of fire protection at the facility.

¹² CSA N293-07, Fire Protection for CANDU Nuclear Power Plants, 2007

110. The Commission sought further assurance from CNSC staff that fire protection at the facility is satisfactory. CNSC staff responded that Bruce Power has made improvements to address the concerns raised during the licence period. CNSC staff further stated that it expects Bruce Power to be compliant with CSA N293-07 during the proposed licence period.
111. One intervenor, Mr. Bourgeois, made an intervention through his counsel, expressing concerns about the environmental impact of Bruce Power's fire training facility, including the air emissions from burning materials that extend over his property. The intervenor emphasized that it was not his submission that the licences being considered for renewal should not be renewed; rather, he raised the possibilities of emissions testing and/or the physical relocation of the fire training facility as his desired outcomes.
112. The Commission sought further information on this matter. Bruce Power submitted that the facility in question falls under the jurisdiction of the Ontario Ministry of Environment (MOE), and indicated that all fire training facilities are exempt from the requirements of Ontario *Environmental Protection Act*¹³. As a result of this, Bruce Power submitted that the CNSC has no jurisdiction to consider the issue raised in the intervention. CNSC staff concurred that the fire training facility is under the responsibility of the MOE, but noted that this does not displace the authority of the CNSC to ensure adequate protection of the environment and health and safety. In this respect, CNSC staff noted that they are in communication with, and work with, the MOE. CNSC staff noted that it understands that the MOE performed a site-wide audit in 2008 and that Bruce Power was compliant.
113. The Commission notes that environmental protection is an area in which there may be valid regulation at various levels of government. In accordance with the purposes of the NSCA, robust emergency preparedness is necessary to ensure adequate protection of the environment and the health and safety of persons arising from the operation of a nuclear power plant. For this reason, it is a licence requirement that Bruce Power, among other things, comply with CSA standards which mandate such emergency preparedness measures as fire drills. All licensees are also required by regulation under the NSCA to take "all reasonable precautions to control the release of ... hazardous substances within the site of the licensed activity and into the environment as a result of the licensed activity." In this context, the Commission is satisfied that its statutory mandate includes verification of whether the purposes of the NSCA are adequately served by a licensee's discharge of its licensed obligations, and of its regulatory obligations. This authority is not taken away by applicable provincial regulatory schemes.

¹³ Revised Statutes of Ontario (R.S.O.) 1990, C. E19

114. As CNSC staff noted, the CNSC seeks to communicate with its provincial regulatory counterparts, and to achieve, insofar as possible, a harmonized approach to the protection of the environment. While the Commission is satisfied at this time that the operation of the licensed activities does not cause unreasonable risk to the environment, it does direct CNSC staff to follow up with the MOE and Bruce Power with respect to the issue of the air emissions from the fire training facility, in order to verify the fire training facility's continued compliance with the requirements of the NSCA.

Conclusion on Emergency Preparedness and Fire Protection

115. Based on the information that was provided, in light of the well-documented exchanges between the Commission and Mr. Bourgeois these past several years, the Commission concludes that the fire protection measures and emergency management program at the facility are adequate to protect the health and safety of persons and the environment. At the same time, the Commission directs CNSC staff to follow up with the MOE and with Bruce Power on the issue of emissions, and to verify the training facility's continued compliance with the NSCA. The Commission directs CNSC staff to provide an update to the Commission with respect to any significant developments on this issue.

Performance Assurance

116. As an indication of the adequacy of Bruce Power's qualifications and protection measures, the Commission examined performance assurance at Bruce B.
117. CNSC staff stated that Performance Assurance is comprised of the following safety areas:
- Quality Management;
 - Human Factors; and
 - Training, Examination and Certification.
118. CNSC staff stated that Bruce Power's overall Performance Assurance meets requirements in both the program documentation and the implementation of the program. CNSC staff noted that overall there has been an improving trend over the licence period.

Quality Management

119. CNSC staff stated that quality management is the program of coordinated activities to direct and control the organization with regards to quality and safety. CNSC staff explained that quality management focuses on the achievement of results, in relation to the quality objectives, to satisfy the needs, expectations and requirements of interested parties as appropriate. CNSC staff further stated that an operational quality management program requires a series of processes necessary for the safe operation of the plant to be integrated and documented in manuals, policies, standards and procedures.
120. Bruce Power provided information regarding its quality management system. Bruce Power stated that it has a Management System Manual to satisfy quality assurance requirements. Bruce Power stated that it has committed to continuous improvement of the Management System Manual, and provided details concerning the improvements it has implemented.
121. Bruce Power also provided information regarding its document hierarchy, which includes Document Quality, Governance, Technology and Document Control. Bruce Power noted that it is developing improvements for these areas. In addition, Bruce Power outlined its initiatives for the proposed licence period, including correcting deficiencies in the document hierarchy, revising policy level documents, improving organizational knowledge of the Management System Manual, and better defining document standards.
122. CNSC staff reported that Bruce Power's quality management program meets requirements in both the program documentation and the implementation of the program. CNSC staff noted that the quality management program improved over the licence period from below expectations at the start to currently meet expectations. CNSC staff further noted that the program implementation declined below expectations during the licence period, but has improved to meet expectations.
123. CNSC staff stated that it carried out several inspections over the licence period, and all of the action notices raised were resolved. CNSC staff explained that Bruce Power shifted from a quality assurance style of oversight to an integrated management system, which resulted in a noticeable improvement to program documents. CNSC staff further noted that Bruce Power has improvement initiatives underway.
124. CNSC staff stated that Bruce Power is currently in the process of transitioning its programs to align with the requirements of CSA standard N286-05¹⁴. CNSC staff stated that Bruce Power's Management System Manual is compliant with N286-05 requirements.

¹⁴ CSA N286-05, Management System Requirements for Nuclear Power Plants, 2005

125. The Commission asked how CNSC staff will oversee the licensee's continual self-improvement, which requires internal self-assessment, external assessments and peer reviews. CNSC staff responded that CSA standard N286-05 includes those requirements, and they are required in the licence.

Human Factors

126. Bruce Power provided information regarding human factors in operating experience (OPEX) and reliability. Bruce Power described its improvement initiatives over the licence period in the areas of the Corrective Action Program (CAP), OPEX and Human Performance. In addition to the completed improvements, Bruce Power stated that it has additional initiatives planned for the proposed licence period. Bruce Power also discussed the results of its programmatic improvements over the licence period.
127. Bruce Power also provided information regarding Human Factors in Work Organization and Job Design. Bruce Power discussed workforce planning initiatives to ensure that the appropriate staffing levels are met for critical positions across the Bruce Power site. Bruce Power stated that it has plans in place to ensure that current programs are managed while improvement strategies are implemented for Bruce Power's future workforce model and staffing levels. Bruce Power discussed its planned improvement initiatives for the proposed licence period.
128. Bruce Power also provided information about Human Factors in Design. Bruce Power explained that the Human Factors Engineering Program Plan governs the implementation of human factors work in all changes within Engineering Change Control. Bruce Power discussed its completed improvements during the licence period and summarized its future initiatives.
129. CNSC staff stated that it reviewed the human factors issues in several program areas, including:
- human factors in design;
 - human reliability analysis;
 - procedures and job aids;
 - human performance programs;
 - performance monitoring and improvement;
 - work organization and job design; and
 - organization and plant management.
130. CNSC staff stated that Bruce Power's human factors program meets requirements in both the program documentation and the implementation of the program. CNSC staff noted that overall there has been little change over the licence period.

131. The Commission asked if Bruce Power has had any significant issues regarding the verification of human performance aspects of the completed recommendations for performance monitoring improvements. CNSC staff stated that it has had no concerns in this regard.

Training, Examination and Certification

132. Bruce Power provided information regarding training, examination and certification of its staff. Bruce Power provided details concerning training for non-certified staff, including leadership training, non-licensed operators training, maintenance training and other key training program review committees. Bruce Power also provided details concerning training for certified staff, including operator training, initial certification programs, re-certification of certified staff (renewal of certification) and regulatory examination results.
133. CNSC staff stated that both Bruce Power's Training, Examination and Certification program and its implementation met requirements over the licence period.
134. In the area of training, CNSC staff explained that it assessed the degree to which the programs were based on systematic approach to training (SAT) principles. CNSC staff stated that it conducted several inspections over the licence period and Bruce Power corrected all deficiencies identified during the inspections.
135. CNSC staff also discussed its oversight activities regarding examination and certification. CNSC staff stated that it was responsible for reviewing and approving certification examinations, monitoring Bruce Power's conduct of the examinations, and reviewing and approving the examination results. CNSC staff stated that it had concerns regarding the results for Authorized Nuclear Operators (ANOs) and Bruce Power identified apparent causes and contributing factors to the poor examination results. CNSC staff stated the responsibility of administering certification examinations has been transferred from the CNSC to Bruce Power through the inclusion of CNSC Regulatory Document RD-204¹⁵ in the licence.
136. CNSC staff also provided information regarding certified staffing levels. CNSC staff stated that Bruce Power has sufficient certified staff assigned to shift positions to support the operation of the facility. CNSC staff stated that Bruce Power is required to have an ANO in direct attendance at the control panels of each reactor unit, and CNSC staff will monitor the control room minimum complement on a regular basis during inspections.

¹⁵ CNSC Regulatory Document RD-204, "Certification of Persons Working at Nuclear Power Plants"

137. The Power Workers Union, in its intervention, expressed concerns regarding the ability of Bruce Power to meet staffing requirements over the proposed licence period. The Commission inquired about Bruce Power's hiring rate in relation to the retirement rate. Bruce Power stated that it has a proactive five-year workforce plan and will be able to maintain an adequate labour force for the next five years. Bruce Power noted that it has a training strategy for the jobs that have longer training periods. CNSC staff concurred that Bruce Power is hiring personnel to replace retirees. CNSC staff stated that employee certification will continue to be a focus during the proposed licence period, and the minimum shift complement will be closely monitored according to licence conditions.
138. The Commission inquired about the differences between the training qualifications for Bruce A and Bruce B. Bruce Power responded that the qualifications are different in the two licences and the two facilities have separate training programs. Bruce Power stated that authorizations are not transferable between the two plants. Bruce Power noted that the minimum shift complements for the two facilities are different, as well.
139. The Commission sought further information regarding Bruce Power's strategy regarding certification failure rates. Bruce Power stated that it utilizes practice examinations and that it has a mentoring program to align employees with experienced operators who can assist them through the training period.

Conclusion on Performance Assurance

140. Based on the provided information, the Commission concludes that Bruce Power has in place the necessary programs in the areas of quality management, human performance and training to assure continued adequate performance at Bruce B.

Public Information Program

141. Bruce Power provided information regarding its public information program. Bruce Power described its public information activities, including the maintenance of its Web site, information sessions and open houses, a newsletter on emergency preparedness, and outreach activities. Bruce Power stated that it posts copies of reports, ecological effect reviews and other documents on its Web site and provides the same copies to stakeholders. Bruce Power stated that it also has a process for receiving and responding to public inquiries.
142. CNSC staff stated that it conducted an inspection of Bruce Power's communications with the public during the licence period. CNSC staff stated that Bruce Power has implemented an acceptable public information process, and that Bruce Power's public information program and its implementation meet requirements.

143. CNSC staff stated that Bruce Power has been open with the news media and the public throughout the duration of the refurbishment project for Bruce NGS A Units 1 and 2. CNSC staff noted that Bruce Power carried out extensive consultations on the environmental assessment screening that was undertaken in the context of the refurbishment project. CNSC staff noted that consultations were conducted with Aboriginal peoples, members of the public and interested parties likely affected by the project. CNSC staff stated that federal departments and agencies (including the CNSC), representatives of the Saugeen Ojibway Nations and Bruce Power have met to develop the whitefish sampling program.
144. Several intervenors, including the County of Bruce, the Canadian Nuclear Workers Council and the South Bruce Impact Advisory Committee expressed support for Bruce Power's involvement with the community and public information program.
145. Citizens for Renewable Energy, in its intervention, stated that although Bruce Power has recognized Citizens for Renewable Energy as a stakeholder and invited it to attend a number of workshops, it has not been added to Bruce Power's mailing list. The Commission sought further information in this regard. Bruce Power responded that its public information program is designed to cover all stakeholders and members of the public, and as such, Bruce Power will ensure that Citizens for Renewable Energy is on the mailing list.
146. Based on all of the information presented on the application, the Commission is satisfied that Bruce Power's public information program meets regulatory requirements and is effective in keeping the public informed on the facility operations.

Security

147. With respect to site security issues, the Commission was provided with separate, protected CMDs, which were considered in a closed session.
148. The Commission concludes that Bruce Power has made adequate provisions for ensuring the physical security of the facility, and is of the opinion that Bruce Power will continue to make adequate provisions during the proposed licence period.

Non-Proliferation and Safeguards

149. 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 International Atomic Energy Agency (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 nuclear activities and materials in this country are declared and that all declared nuclear materials are in peaceful, non-explosive uses.

150. Bruce Power provided information regarding safeguards. Bruce Power stated that it is fully compliant with all safeguards licence conditions and IAEA requirements and maintains open communication with the IAEA on safeguards issues. Bruce Power provided an overview of its activities related to IAEA requirements over the licence period.
151. CNSC staff reported that Bruce Power's safeguards program meets requirements in both the program documentation and the implementation of the program. CNSC staff noted that overall there has been little change over the licence period.
152. CNSC staff stated that Bruce Power provided all reports and information necessary for safeguards and has complied with IAEA and CNSC requests. CNSC staff further stated that the IAEA conducted multiple inventory and information verifications over the licence period, and Bruce Power provided the IAEA all necessary access and assistance to perform its activities. CNSC staff noted that Bruce Power has improvement plans in place for the proposed licence period, including remote monitoring capabilities.
153. Based on the provided information, the Commission is satisfied that Bruce Power has made and will continue to make adequate provisions in the areas of safeguards and non-proliferation at the facility that are necessary for maintaining national security and measures necessary for implementing international agreements to which Canada has agreed.

Decommissioning Plans and Financial Guarantee

154. The Commission requires that the licensee has operational plans for decommissioning and long-term management of waste produced during the life-span of the facility. In order to ensure that adequate resources are available for a safe and secure future decommissioning of the facility site, the Commission requires that an adequate financial guarantee for realization of the planned activities is put in place and maintained in a form acceptable to the Commission throughout the licence period.
155. CNSC staff provided information regarding the preliminary decommissioning plan (PDP) and financial guarantee for the Bruce facility. CNSC staff stated that the March 2007 PDP that meets the requirements of CNSC regulatory guide G-219¹⁶ and was accepted by CNSC staff remains in effect.
156. Regarding the financial guarantee, CNSC staff stated that OPG is responsible for the costs associated with decommissioning Bruce A and Bruce B once they have been returned to OPG, in accordance with the lease agreement between OPG and Bruce Power. CNSC staff noted that Bruce Power is to return the NGSs to OPG in safe shutdown state, which includes de-fuelling and de-watering. CNSC staff stated that Bruce Power provided the value of costs leading to the initiation of the decommissioning plan, including de-fuelling and de-watering. CNSC staff stated that

¹⁶ CNSC Regulatory Guide G-219 "Decommissioning Planning for Licensed Activities", June 2000.

Bruce Power is not required to provide operational financial guarantees to CNSC in the proposed licence, since although the lease requires Bruce Power to pay for de-fuelling and dewatering, the costs for these activities have been built into the Decommissioning Plan and funded appropriately by OPG.

157. The Commission sought clarification regarding the financial guarantee. CNSC staff explained that OPG is responsible for bringing the plant into a dewatered and de-fuelled state and OPG has set aside sufficient funds to de-fuel and de-water the reactors in the event that Bruce Power is insolvent.
158. The Commission asked if the LCH contains the details concerning decommissioning and safe shutdown. CNSC staff responded that decommissioning is included in the LCH and states that OPG is responsible for all costs of decommissioning. The Commission noted that the details concerning the decommissioning are not included in the LCH. CNSC staff stated that the value of cost estimate for decommissioning both Bruce A and Bruce B is estimated at approximately \$100 million, and includes de-watering and de-fuelling.
159. Based on the provided information, the Commission considers that the preliminary decommissioning plans and related financial guarantees are acceptable for the purpose of the current application for licence renewal. The Commission directs CNSC staff to ensure that the LCH explicitly states the details regarding decommissioning, including de-fuelling and de-watering, as well as the cost estimate. The Commission is satisfied that adequate provisions are in place such that Bruce Power is not required to provide operational financial guarantees in the proposed licence.

Application of the *Canadian Environmental Assessment Act*

160. Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act*¹⁷ (CEAA) have been fulfilled.
161. CNSC staff indicated that the application to renew the licence for the facility under subsection 24(2) of the NSCA is not prescribed for the purposes of paragraph 5(1)(d) of the CEAA in the *Law List Regulations*¹⁸. Since there are no other CEAA triggers for this project that involve the CNSC, CNSC staff stated that an environmental assessment under CEAA is not required.
162. Based upon the above assessment, the Commission is satisfied that an environmental assessment under the CEAA is not required for Bruce Power's application for licence renewal.

¹⁷ S.C. 1992, c. 37

¹⁸ S.O.R./94-636.

Licence Length and Conditions

163. Bruce Power has applied to the CNSC for a five-year renewal of its operating licence for the Bruce NGS B. CNSC staff supported the request and recommended that the Commission accept and grant the proposed five-year term. CNSC staff stated that Bruce Power is qualified to operate for the proposed licence period, and that there is adequate management and oversight in place for all processes. CNSC staff further stated that Bruce Power is in good standing for cost recovery and meets the Nuclear Liability Insurance requirements of the *Nuclear Liability Act*¹⁹.
164. Several intervenors representing area municipalities, Historic Saugeen Métis, local government, workers' unions and businesses supported Bruce Power's request and CNSC staff's recommendation for a five-year licence. Citizens for Renewable Energy suggested no more than a two-year licence period in order for Bruce Power to address safety issues.
165. CNSC staff proposed a new licence format for the Bruce B licence. CNSC staff explained that the new licence format incorporates the use of a LCH and is meant to strengthen regulatory oversight, increase regulatory effectiveness and efficiency, and reduce administrative efforts. Bruce Power expressed its acceptance of the new licence format.
166. CNSC staff explained that the new licence incorporates a risk-informed approach, eliminates cascading references to changing working-level licensee documentation and establishes compliance verification criteria to be used by the licensee for self-compliance verification and by CNSC staff for a regulatory focus on risk-significant items. CNSC staff further explained that the proposed licence conditions refer to well-defined policies or programs, specific requirements in accepted standards and regulatory documents, and tables of numerical limits which define the limits of authorization issued by the Commission.
167. CNSC staff provided details regarding the licence structure. CNSC staff stated that the licence format is in accordance with the CNSC's internal processes. CNSC staff noted that the major changes include:
 - the introduction of CSA standard CSA N286.0-05;
 - the use of Operational Polices and Procedures that describe the operational practices and describe the operational limits;
 - the introduction of regulatory limits in the licence appendices; and
 - the elimination of referencing licensee-produced documents.

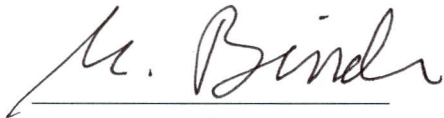
¹⁹ Revised Status of Canada (R.S.), 1985, c. N-28.

168. CNSC staff stated that the proposed licence structure has three key terms:
- Acceptance – compliance against requirements defined in a CSA standard referenced in the licence condition;
 - Consent – acceptance by CNSC staff against pre-established criteria; and
 - Approval – only the Commission has the authority to approve changes.
169. CNSC staff explained that licensed activities are based on a management system, CSA standard N286-05, which gives the Commission added assurance that the licensee will comply with regulatory requirements. CNSC staff further explained that under the proposed approach, the licensee is responsible for the safe operation of the facility while CNSC staff carries out regulatory verification. CNSC staff noted that the licence lists the requirements for the safe operating envelope.
170. In addition to the licence, CNSC staff provided information regarding the LCH. CNSC staff explained that the LCH consolidates compliance verification criteria, provides interpretations and clarifies how the licensee must be in compliance with the licence. CNSC staff further explained that the LCH is specific to each individual facility.
171. In addition to the proposed licence format, the CNSC staff requested that the following positions be regarded as “a person authorized by the Commission”:
- Regulatory Program Division Directors;
 - Directorate or Power Reactor Regulation Director General; and
 - Regulatory Operations Branch Executive Vice-President.
172. Citizens for Renewable Energy, in its intervention, stated that it opposed CNSC staff’s proposed delegation of authority because it might streamline regulations. CNSC staff clarified that it will not have the authority to amend the licence; pursuant to the NSCA, only the Commission can consider an application for a licence amendment.
173. The Commission asked CNSC staff whether it plans on having a formal review of the effectiveness of the new licence format. CNSC staff responded that it will update the Commission on the licence and LCH on an annual basis as part of the annual performance review, and provide additional updates as frequently as required. In addition, CNSC staff stated that it will likely review the licence process in two or three years in order to see if any further improvements can be made. The Commission requests that CNSC staff set a date for a systematic review of the new licence and LCH.
174. Based on the provided information and above considerations, the Commission is satisfied that a five-year licence is appropriate. The Commission accepts the licence format, licence conditions and LCH as recommended by CNSC staff. The Commission also accepts CNSC staff’s recommendation regarding the delegation of authority, and notes that CNSC staff can bring any matter to the Commission as applicable. The Commission directs CNSC staff to inform the Commission of any changes made to the LCH.

Conclusion

175. The Commission has considered the information and submissions of CNSC 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.
176. 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.
177. 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 of the opinion 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.
178. Therefore, the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews the power reactor operating licence issued to Bruce Power Inc., for its Bruce Nuclear Generating Station B located in the municipality of Kincardine, Ontario. The licence, PROL 16.00/2014, will be valid from November 1, 2009 to October 31, 2014.
179. The Commission includes in the licence the conditions as recommended by CNSC staff and set out in the draft licence attached to CMD 08-H30.D.
180. With this decision, the Commission requests that CNSC staff submit a separate report containing detailed information on the status of Bruce Power's environmental follow-up monitoring program regarding whitefish, the status of ageing management, any safety-significant dates for equipment, any forecasted end of life plans for Bruce B and the status of the LCH at the same time as CNSC staff presents its annual Integrated Safety Assessment of Canadian Nuclear Power Plants. CNSC staff shall present its separate report at a public proceeding of the Commission in approximately June of each year. The Commission notes that the public will have an opportunity to provide written comments on this report. In addition, the Commission directs CNSC staff to provide an update to the Commission with respect to any significant developments regarding emissions from Bruce Power's fire training facility.
181. The Commission expresses its discontent regarding the material submitted by both Bruce Power and CNSC staff for Day 2 of the hearing. The Commission expects that the material submitted for Day 2 of any hearings will be presented in a more logical, readable and complete manner, with a clear definition of what has changed since Day 1. The Commission expects that supplementary materials will be submitted in accordance with the timelines established in the *Canadian Nuclear Safety Commission*

Rules of Procedure. The Commission is of the view that supplementary material must be presented in a manner that allows for meaningful public participation. The Commission believes that the public should have the opportunity to make more meaningful submissions and that it is unreasonable to expect the public to comment on last-minute submissions that contain major updates and revisions.



NOV 19 2009

Michael Binder
President,
Canadian Nuclear Safety Commission

Date

Appendix A – Intervenors

Intervenors	Document Number
Corporation of the County of Bruce, represented by W. Goetz	CMD 08-H30.3 CMD 08-H30.3A
Eugene Bourgeois, represented by P. Scott	CMD 08-H30.4 CMD 08-H30.4A
Power Workers' Union, represented by P. Falconer, L. Alderdice and H. Phorson	CMD 08-H30.5 CMD 08-H30.5A
Canadian Nuclear Workers' Council and the Gret-Bruce District Labour Council, represented by D. Shier and D. Trumble	CMD 08-H30.6 CMD 08-H30.6A
Saugeen Ojibway Nations, represented by Chief R. Kahgee and A. Pape	CMD 08-H30.7 CMD 08-H30.7A
Citizens For Renewable Energy, represented by Z. Kleinau	CMD 08-H30.8
Greenpeace, represented by S-P. Stensil	CMD 08-H30.9
Historic Saugeen Métis, represented by J. Abouchard and J. Indoe	CMD 08-H30.10
Society of Energy Professionals	CMD 08-H30.11
South Bruce Impact Advisory Committee	CMD 08-H30.12