Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant	Ontario Power Generation Inc.
Subject	Application to Renew the Power Reactor Operating Licence for the Pickering B Nuclear Generating Station
Hearing Dates	February 20, 2008 and May 14, 2008

RECORD OF PROCEEDINGS

Applicant:	Ontario Power Generation Inc.
Address/Location:	1675 Montgomery Park Road, Box 160, Pickering, Ontario L1V 2R5
Purpose:	Application to renew the Power Reactor Operating Licence for the Pickering B Nuclear Generating Station
Application received:	September 13, 2007
Dates of hearing:	February 20, 2008 and May 14, 2008
Location:	Canadian Nuclear Safety Commission (CNSC) Public Hearing Room, 280 Slater St., 14th. Floor, Ottawa, Ontario (Day one) and Ajax Convention Centre, 550 Beck Crescent, Ajax, Ontario (Day two)
Members present:	M. Binder, Chair A.R. Graham C.R. Barnes R. J. Barriault M. J. McDill A. Harvey
Secretary:	M.A. Leblanc
Recording Secretary:	M. Young
General Counsel:	J. Lavoie

Applicant Represented By	**Document Number**
• T. Mitchell, Chief Nuclear Officer • P. Tremblay, Senior Vice-President • B. Goodman, Director of Engineering • F. Dermarkar, Director of Engineering Services • J. Shaw, Director of Nuclear Protection Programs and Training • P. Spekkens, Vice-President of Science and Technology Development	CMD 08-H4.1A CMD 08-H4.1B CMD 08-H4.1C CMD 08-H4.1D CMD 08-H4.1E
CNSC staff	**Document Number**
• P. Elder • T. Schaubel • C. Morency • P. Thompson • D. Newland • M. Couture	CMD 08-H4 CMD 08-H4.A CMD 08-H4.B CMD 08-H4.C CMD 08-H4.D CMD 08-H4.E
Intervenors	**Document Number**
See appendix A	

Licence: Renewed
Date of Release of Decision: June 24, 2008

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Introduction

1. Ontario Power Generation Inc. (OPG) has applied to the Canadian Nuclear Safety Commission[1] (CNSC) for the renewal of the Power Reactor Operating Licence (PROL) for its Pickering B Nuclear Generating Station (NGS) located in Pickering, Ontario. The current operating licence, PROL 08.15/2008, expires on June 30, 2008. OPG has applied for the renewal of this licence for a period of five years.

2. The Pickering B NGS is located in the Province of Ontario on the north shore of Lake Ontario, in the City of Pickering in the Regional Municipality of Durham. The Pickering B NGS nuclear facility comprises four 540-megawatts net electrical output CANDU reactors and their associated equipment (Unit 5, Unit 6, Unit 7 and Unit 8). The separately licensed Pickering A NGS, consisting of four similar reactor units, is located immediately adjacent to the Pickering B NGS.

Issues

3. In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*[2]:

   a) if OPG is qualified to carry on the activity that the licence would authorize; and

   b) if, in carrying on that activity, OPG would make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

Public Hearing

4. 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 February 20, 2008 in Ottawa, Ontario and on May 14, 2008 in Ajax, Ontario. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*[3]. During the public hearing, the Commission received written submissions and heard oral presentations from CNSC staff (CMD 08-H4, 08-H4.A, 08-H4.B, 08-H4.C, 08-H4.D and 08-H4.E) and OPG (CMD 08-H4.1A, 08-H4.1B, 08-H4.1C, 08-H4.1D and 08-H4.1E). The Commission also considered oral and written submissions from 28 intervenors (see Appendix A for a detailed list of interventions).

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[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] S.C. 1997, c. 9.
[3] S.O.R./2000-211.

5. On Day 1 of the of the Pickering B licence renewal hearing, Greenpeace Canada (Greenpeace) submitted a request that the Commission instruct OPG to release the Pickering B Probabilistic Risk Assessment documentation, pursuant to section 20 of the *Canadian Nuclear Safety Commission Rules of Procedure*. The Commission considered written submissions from Greenpeace (CMD 08-H4.29), OPG and CNSC Staff in relation to the matter, and decided not to instruct OPG to release the documentation.

6. The Commission is of the view that disclosure of this information may be prejudicial to the security interests of Canadians. The Commission is also of the view that disclosure of this information is not essential for the development of Greenpeace's intervention for Day 2 of the Pickering B licence renewal hearing, as comprehensive and relevant information is available to interested parties.

7. Following the two-day public hearing, OPG made a supplemental request to incorporate a new version of a document listed in Appendix B of the proposed licence, "Records and Document Control, N-PROG-AS-0006 R07". CNSC staff reviewed OPG's request in CMD 08-H4.E and determined that the request is administrative in nature and does not have any substantive impact on records and document control within OPG. The Commission determined that because the request is administrative in nature, it was not necessary to hold a public hearing on the matter, and as such, it was placed under consideration for the current licence renewal.

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

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews Ontario Power Generation Inc.'s Nuclear Power Reactor Operating Licence PROL 08.15/2008 for the operation of the Pickering B Nuclear Generating Station. The renewed licence, PROL 08.00/2013, is valid from July 1, 2008 to June 30, 2013.

9. The Commission includes in the licence the conditions as recommended by CNSC staff in CMD 08-H4.C and CMD 08-H4.E.

10. The Commission requests that CNSC staff present the Commission with a report regarding the End-of-Life plans for the facility. The report will be presented at a public proceeding, approximately three months after the expected submission of OPG's proposed End-of-Life Action Plan in December 2009.

11. The Commission expects that a status report on the facility's performance will be provided annually through the Annual CNSC Staff Reports on the Safety Performance of the Canadian Nuclear Power Industry.

Issues and Commission Findings

12. In making its licensing decision, the Commission considered a number of issues related to OPG's qualification to operate the Pickering B NGS 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.

Operating Performance

13. The Commission considered the operating performance at the Pickering B NGS as an indication of OPG's qualifications to continue to safely operate the plant 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 non-radiological health and safety.

Organization and Plant Management

14. OPG described its organizational structure and plant management. OPG stated that the objective of its organization is to achieve the following:

- have a sufficient number of qualified staff to safely operate, maintain and support the Pickering B NGS;
- maximize the efficiency and effectiveness of its workforce; and
- hold employees at all levels accountable for performing their duties in accordance with OPG's standards and procedures.

15. CNSC staff reported that OPG's organization and plant management program meets requirements in both the program documentation and the implementation of the program. CNSC staff noted that overall there has been a deteriorating trend over the licence period based on some noted deficiencies, including the adequacy of current staffing levels.

16. CNSC staff stated that resource issues have been identified as causing work delays and outage extensions. CNSC staff stated that it has detected a rising trend in the demand for additional resources. CNSC staff further stated that staffing levels have not adversely affected the safe operation of the facility, but would continue to monitor this issue.

17. The Commission asked if OPG is satisfied that it has enough staff to run the plant now and in the future. OPG responded that its staff levels are comparable to other benchmark utilities. OPG stated that there are processes in place to maintain oversight of the staffing levels and the organizational structure for the next licence period. OPG stated that it has a hiring strategy in place, which is complemented through partnerships with a number of universities and colleges. OPG noted that senior management actively participate in annual new hire recruitment processes.

18. The Commission asked CNSC staff if it had any concerns regarding overtime work. CNSC staff responded that there are concerns for overtime work for engineering, management and maintenance staff. CNSC staff submitted that a licence condition be added to the proposed licence to ensure that hours of work are monitored. OPG stated that it imposes a maximum of 60 hours per week for its employees, but noted that no such limit exists for contractors at this time.

19. The Power Workers' Union expressed similar concerns about employee work hours. The Power Workers' Union noted that the average work week is between 35 to 40 hours, with some going up to 60 hours during outages. The Power Workers' Union noted that overtime is voluntary, and the Power Worker's Union tries to ensure that the types of work schedules that are being put forward are the most amenable to those workers.

20. On the subject of reporting requirements, CNSC staff stated that, in several instances, OPG was in non-compliance with CNSC Regulatory Document S-99 "Reporting Requirements for Operating Nuclear Power Plants." CNSC staff stated that it conducted an inspection in February 2008 to verify compliance in this regard. CNSC staff stated that it identified positive findings and improvements, although two action notices were issued with regards to the control of documents and additional reports. CNSC staff stated that it expects the action notices to be fully resolved by September 2008.

21. OPG acknowledged that it had failed to report monitoring results for routine releases of hazardous substances to the CNSC, as required. OPG stated that it had been reporting this information to the Ontario Ministry of the Environment (MOE), but has since resolved the issue and will be reporting to the CNSC through quarterly reports.

22. The Commission asked if OPG is required to report potential research findings. CNSC staff responded that licensees are required to report potential findings from research activities if a research result is applied to the safety reports and there is a potential degradation of safety. CNSC staff stated that OPG has changed its process to ensure this is done, and it is expected that OPG will take mitigating action until that information is verified.

Conduct of Operations

23. OPG reported on the operation of the plant and informed the Commission that the Pickering B NGS continued to operate according to the operational program requirements. OPG stated that it developed and executed a Quality Improvement Plan in 2006/2007 that captured the following key focus areas:

- operations leadership;
- operator fundamentals;
- training; and
- improving operations support of the integrated operations plan.

24. OPG presented its results in the following areas:

- improved operations leadership;
- improved performance in human performance;
- greater focus on operations as a learning organization;
- other known issues (loss of grid, algae intake, liquid zone, shift complement); and
- future improvements.

25. With regards to outage management, OPG stated that it implemented the Outage Milestones Management Process to monitor completion and challenge the quality of the milestone completion. OPG stated that it has made improvements in the amount of work completed during planned outages, which includes maintenance and inspection activities. OPG stated that it has several initiatives in place to continue the outage improvements, including the Outage Improvement Plan. OPG noted that it expects to achieve outages in the 40-50 day range starting in 2009.

26. CNSC staff stated that its evaluations of OPG's outage management did not identify any safety issues, but OPG has had some persistent problems, including unavailability of parts, delays and poor planning and co-ordination. CNSC staff noted that while OPG has made improvements, it has yet to demonstrate a definite improvement trend. CNSC staff further noted that sustained improvement would lead to better outage management and results.

27. The Commission asked OPG to comment on its work towards improving outage management. OPG responded that it has benchmarked organizational design, and progress is being made to increase productivity and work effort. OPG noted that it has put in significant effort towards the corrective maintenance backlog reduction.

28. CNSC staff stated that OPG's operations 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, with no major issues.

29. CNSC staff stated that, based on field and control room inspections, OPG operating staff at the Pickering B NGS follows procedures, performs necessary testing and verification and complies with the requirements of the operating licence.

30. CNSC staff also stated that OPG's system surveillance program meets industry standards and the system health monitoring has been in accordance with this program. CNSC staff noted some gaps in the continuity of system performance monitoring related to the high turnover of engineering staff.

Conventional Health and Safety

31. OPG stated that in order to ensure that the overall objective of managing occupational hazards is met, it monitors the following indicators:

- All Injury Rate (AIR);
- Accident Severity Rate (ASR);
- High Maximum Reasonable Potential for Harm Events; and
- Industrial Safety Accident Rate (ISAR).

32. CNSC staff stated that OPG's occupational health and safety 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, although there have been some indications of improvement. CNSC staff stated that OPG regularly meets is annual targets for AIR, ASR and ISAR.

33. CNSC staff noted that OPG's improvement plans over the licence period include the Glove Policy, which has resulted in a reduction in hand injuries, and the Musculoskeletal Disorder/Injury (MSD/MSI) Risk Reduction Plan.

34. The Commission sought further information concerning OPG's return to work program. OPG provided the Commission with a flowchart detailing Disability Management and Return to Work Processes.

35. The Commission asked if OPG tracks contractor performance in addition to that of Pickering B NGS employees. OPG responded that it does.

36. The Commission inquired about the level of medical examinations for OPG employees. OPG stated that it has a Wellness section that supports a variety of programs to ensure that employees are receiving adequate and appropriate medical care. OPG further stated that health assessments are used to validate an individual's fitness for return to work.

Conclusions on Operating Performance

37. The Commission is satisfied that the operation of the facility during the licence period has not posed an unreasonable risk to the health and safety of workers or the public. The Commission is of the opinion that, with the implementation of the occupational health and safety program, the continued operation of the facility will not pose an unreasonable risk to the health and safety of persons.

38. Based on its consideration of the presented information, the Commission concludes that OPG has appropriate organization and management structures in place and that the operating performance at the Pickering B NGS provides a positive indication of OPG's ability to adequately carry out the activities under the proposed licence.

Performance Assurance

39. As an indication of the adequacy of OPG's qualifications and protection measures, the Commission examined performance assurance at the Pickering B NGS.

40. CNSC staff stated that Performance Assurance is comprised of the following safety areas:

- Quality Management;
- Human Factors; and
- Training, Examination and Certification.

41. CNSC staff stated that OPG'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 little change over the licence period.

Quality Management

42. 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.

43. OPG informed the Commission on its coordinated activities carried out in order to achieve the required levels of quality and safety in the operation of the Pickering B NGS. OPG also noted the existence of a multi-tiered system of planned reviews and audit activities. OPG stated that the first three-year nuclear oversight audit cycle was completed in December 2006.

44. CNSC staff stated that OPG's quality management program meets requirements in both the program documentation and the implementation of the program. CNSC staff stated that it carried out several inspections over the licence period, and all of the action notices raised were resolved.

Human Factors

45. OPG stated that a human performance event is defined as an undesirable change in the state of plant structures, systems, components or conditions caused by active or latent human performance errors. OPG outlined its Human Performance Improvement Plan and the activities to accomplish the program objectives.

46. OPG further reported the results of the program in the following areas:

- self-assessments, Nuclear Oversight Audits and CNSC Investigations focused on procedural use and adherence;
- Event Free Day Resets, which have improved since 2003;
- Most Error Likely Task Identification, which enhances the existing methods of addressing risk in order to support the conduct of operations, maintenance and outages;
- Recognition Awards; and
- CNSC inspections.

47. CNSC staff stated that OPG'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.

48. CNSC staff stated that it reviewed the human factors issues in several program areas, including:

- Human Factors in Design;
- Procedures and Job Aids;
- Work Organization and Job Design;
- Human Reliability Analysis; and
- Human Performance.

49. CNSC staff stated that there were no significant issues concerning the programs for Human Factors in Design, Procedures and Job Aids, Reliability and Analysis, and Human Performance. With regards to Work Organization and Job Design, CNSC staff submitted that OPG's document "Limits to Hours of Work" should be added as a licence condition.

50. With regards to the implementation of these programs, CNSC staff stated that it had conducted several inspections over the licence period, and further follow-up and continued monitoring is required for several issues.

51. In addition, OPG described its current initiatives, as well as its planned improvements. OPG noted that the results of an on-site survey to gauge employee engagement have shown improvements in OPG's employee's feelings and perceptions about OPG.

52. The Commission expressed concerns that the results of the survey may indicate that a majority of OPG employees are not motivated to do their best work. The Society of Energy Professionals, in its intervention, shared these concerns. OPG stated that, going forward, it plans to engage its employees in cross-functional teams so that they can work with other groups to get involved with solving problems. OPG acknowledged that it is making an effort to improve employee engagement. CNSC staff stated that it is satisfied with the progress that OPG is making, and it expects that the situation will improve.

Training, Examination and Certification

53. OPG stated that training programs related to safe and reliable plant operation, health and safety of the public and plant personnel are developed, implemented and maintained to improve the necessary knowledge and skills of personnel to perform job functions. OPG presented the results of its training programs, which include Re-qualification Testing of Certified Staff, Continuing Training for Certified Staff, Shift Supervisor In Training, Science Fundamentals and Equipment Principles, Certified Staff (plus trainees), Training Program for Non-Licensed Operators and the Shift Supervisor Certification Program.

54. OPG reported on the examination success rate for Initial Examinations and Re-Certification over the licence period. OPG noted that it is satisfied with the results in all areas but the Shift Supervisor/Manager area, where the 29% failure rate was below the industry standard. OPG stated that the candidates in this area were successfully re-certified and no certifications were lost.

55. The Commission sought further information concerning the high failure rate. OPG responded that the high number of failures pertained specifically to a group of individuals' exam techniques and familiarity with writing the exam. CNSC staff concurred with OPG that the individuals have been re-certified and returned to shift work. CNSC staff stated that, based on the improvement it has observed, it expects that this high failure rate will not continue.

56. OPG outlined its planned improvements, which focus on OPG continuing to demonstrate to the CNSC its capability to self-administer the certified staff training and examinations.

57. CNSC staff stated that, due to deficiencies found in Revision 8 of OPG's "Training" document, the training program is below requirements. CNSC staff noted that although the risk of the program falling significantly below requirements remains low, improvements are required. CNSC staff explained that if the deficiencies are not addressed, it could result in a degradation of training, which could hinder the ability for OPG to ensure that workers are qualified to perform work. CNSC staff noted this would not adversely impact the qualification of the workers. CNSC staff stated that it is confident that by addressing the deficiencies, OPG's training program will return to a state that meets requirements. CNSC staff further noted that a new licence condition has been proposed which would prevent OPG from revising its documents without notifying the CNSC.

58. CNSC staff stated that the implementation of OPG's training, examination and certification programs meets requirements.

59. CNSC staff stated that it conducted several inspections on OPG training programs over the licence period, with a focus on the certification training programs. CNSC staff stated that OPG has corrected or is close to correcting the deficiencies found during the inspections. CNSC staff stated that it is satisfied with the corrective actions that OPG has taken to date, and notes that closure is expected by the end of 2008.

60. CNSC staff stated that it conducted several inspections and audits regarding examinations and certification. CNSC staff stated that corrective actions have been taken regarding action notices and recommendations.

61. The Commission noted the importance of the areas of staffing, training and shift complements to ensure that the plant is run in a safe and orderly manner. With this in mind, the Commission sought further information regarding the degradation of the training program. OPG explained that the degradation was due to it not being clear that a systematic approach to training is being used in the revised training program. OPG stated that it has to correct its training governance in that respect.

Conclusions on Performance Assurance

62. Based on the above information and considerations, the Commission concludes that OPG has in place the necessary programs in the areas of quality management, human performance and training to assure continued adequate performance at the Pickering B NGS.

Radiation Protection

63. OPG stated that the objective of its radiation protection program is to minimize radiation exposures resulting from the operation of the plant by taking effective measures to control radioactive contamination using best industry practices to protect workers from ionizing radiation. OPG explained that the objectives of the Pickering B NGS radiation protection program include:

- control of radiation exposure to ensure compliance with regulatory limits;
- developing and implementing strategies to reduce doses to ALARA (As Low As Reasonably Achievable);
- radiation instrument management;
- contamination control;
- reduction of events, including S-99 radiation protection related events; and
- operational readiness to support running and outage units.

64. OPG reported that for the current licence period, 2003 to 2007, there was no recordable dose at Pickering B that exceeded the regulatory limits or was in excess of OPG's Administrative Limits.

65. CNSC staff stated that both the radiation protection program and implementation of the program meet CNSC requirements. CNSC staff also noted that there has been little change in the performance of the program and implementation, as they have met requirements each year over the licence period.

66. CNSC staff stated that all of the program elements of an effective radiation protection program were evaluated through compliance and verification activities, including inspections, routine follow-up activities and review of unplanned events. CNSC staff noted that a Type I inspection carried out in April/May 2005 resulted in the issuance of twelve action items, four of which remain open. CNSC staff noted that OPG is currently working towards the closure of the remaining action items by June 2008.

67. The Commission sought further information concerning the remaining action items. OPG responded that the remaining actions are related to the end of a two-year implementation program for respiratory protection. OPG confirmed that the items would be completed by June 2008.

68. CNSC staff noted that over the course of the licence period, four events resulted in action levels being exceeded. Action levels serve as an early warning of a condition that warrants further investigation. CNSC staff noted that in each case, corrective actions were put in place by OPG to restore the effectiveness of the radiation protection program.

69. CNSC staff stated that OPG has demonstrated commitment to dose reduction and good industry practices through various methods, including the use of up-to-date technology such as teledosimetry and remote monitoring.

Protection of Workers from Radiation

70. OPG stated that the indicators it uses to measure the quality of the radiological protection of workers at Pickering B include:

- radiation exposure (external & internal);
- unplanned exposures;
- unposted hazards;
- radiation protection-related S-99 reportable events;
- contamination control; and
- radiation protection human performance index.

71. OPG stated that the Pickering B exposure control program continues to be in full compliance with regulatory requirements. OPG stated that the individual exposure control level of 10 millisieverts per calendar year (mSv/y) is significantly below the prescribed dose limits of 50 mSv in one year or 100 mSv over the five year dosimetry period. OPG noted that annual radiation dose targets are established each year, based on planned outages, station activities and normal operations.

72. CNSC staff provided the Commission with a table of collective doses over the licence period, and concurred with OPG that no worker exceeded the prescribed limits.

73. The Commission sought further information concerning OPG's targets for its Five-Year Operating Plan. OPG responded that in 2010 the vacuum building outage will take place with a coincident shutdown of all four units. OPG also noted that 2008 will have two major outages comprised of a feeder replacement and boiler divider plate repairs.

74. F. Greening, an intervenor, expressed concerns over the dose received by workers working on the feeder tubes. CNSC staff stated that OPG has demonstrated that its radiation protection program continues to minimize doses to workers through the implementation of monitoring, the ALARA principle and dose reduction initiatives.

75. The Power Workers Union, in its intervention, stated that it participates with OPG on a Radiation Protection Committee, which meets quarterly to review and improve OPG's site radiation protection program.

Protection of the Public from Radiation

76. OPG stated that it operates a Radiological Environmental Monitoring Program to accurately estimate the public dose. OPG stated that it calculates the public dose for six age classes ranging from infant to adult using data from analyses of air, water, milk, fish and vegetation samples, as well as station emission data. OPG stated that the highest potential dose is the annual value for each class. OPG noted that most persons would actually receive less than the annual value because they live further from the site. OPG stated that its target is 10.0 microsieverts per year (µSv/y), and the actual values have been lower over the licence period, including 2.8 µSv/y in 2006 and 2.6 µSv/y in 2007. The regulatory effective dose limit for members of the public is 1 mSv/y (1000 µSv/y).

77. OPG further stated that one component of the dose to the public is the internal exposure due to tritium emissions. OPG stated that it has been monitoring tritium emissions and noted that emissions have been below target for 2005, 2006 and 2007.

78. CNSC staff concurred with OPG's assessment and stated that it plans on reporting on its recent inspection of OPG's airborne tritium sampling and analysis.

79. The Durham Nuclear Health Committee, in its intervention, stated that OPG has been open in discussing radiological emissions to assess potential health effects to the public.

80. D. Buckingham, an intervenor, expressed concerns over the effects of uranium exploration. The Commission notes that the CNSC has not received any licence applications for siting or constructing any new uranium mines in Ontario. The Commission also notes that mine exploration falls under provincial jurisdiction.

Conclusion on Radiation Protection

81. The Commission concludes that the operation of the facility during the licence term has not posed an unreasonable radiation risk to workers or the public. The Commission is of the opinion that the continued operation of the facility with full implementation of the radiation protection program will not pose an unreasonable radiation risk to health and safety of persons or the environment.

Environmental Protection

82. OPG stated that it has established an environmental management program to monitor, assess and control the environmental risks associated with station activities and to ensure that those activities are conducted such that their adverse impact on the environment is ALARA. OPG outlined the goals of its environmental management program, the results of which include the:

- Environmental Action Plan (EAP);
- Community Advisory Committee;
- ISO 14001 – Environmental Management System;
- Ecological Risk Assessment;
- Wildlife Habitat Council; and
- Biodiversity and Natural Areas Management Program.

83. OPG stated that the EAP was initiated in 1998 and is approximately 90% complete. OPG stated that the EAP is scheduled to be completed beyond 2010. CNSC staff stated that it has tracked the progress of the EAP and a preliminary review of the 2007 annual progress report verified that the EAP is near completion.

84. OPG stated that it operates under numerous environmental regulations governing plant operations. OPG stated that the key regulators are the CNSC and the Ontario Ministry of the Environment (MOE). OPG, noting that there are three classifications of environmental infractions under the MOE (major, moderate and minor), reported its yearly infractions from 2005 to 2007. OPG stated that over the period from January 2005 to November 2007, it had no major infractions, 31 moderate infractions and 27 minor infractions. OPG also provided explanations for the infractions.

85. OPG stated that it monitors airborne emissions for tritium, carbon-14, iodine, noble gases and particulates, and waterborne emissions for tritium, carbon-14 and gross radioactivity. OPG noted that the limits on emissions were derived by OPG and approved by the CNSC.

86. CNSC staff stated that OPG's environmental management 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.

87. CNSC staff noted the following issues, which it considered to be minor deviations from requirements that do not represent an unreasonable risk to the environment:

- increasing carbon-14 emissions;
- leakage from Irradiated Fuel Bay B; and
- non-compliance with S-99 reporting requirements related to hazardous substances.

88. Several intervenors expressed support for the commitment OPG has shown to operate in an environmentally responsible manner.

Effluent Monitoring

Air Emissions

89. 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 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.

90. OPG stated that during the licence period, Pickering B NGS did not exceed the DRL or the Action Limit (10% of the DRL) for any radiological emission to air on an annual basis. OPG further stated that tritium emissions have remained stable, while iodine, particulate and noble gas reported emissions have decreased. CNSC staff concurred with this assessment.

91. OPG reported that carbon-14 emissions have increased since 2003. OPG attributed the increase in carbon-14 releases to the continual leak due to a calandria tube leak. OPG noted that it is currently employing efforts to address this issue. CNSC staff stated that it is monitoring OPG's efforts to reverse the increasing trend in these releases.

92. Citizens For Renewable Energy, in its intervention, expressed concerns over the health impact of the carbon-14 emissions. CNSC staff noted that although the carbon-14 releases have increased substantially, they are still well below regulatory limits and would not be associated with potential health effects.

93. The Commission asked OPG if it has a timetable to implement the technology to capture gaseous carbon-14 releases from the site. OPG responded that the timeline is over the next year to a year-and-a-half. CNSC staff noted that the improvements are expected to reduce the carbon-14 emissions to a much lower level.

Water Emissions

94. OPG stated that during the licence period, Pickering B NGS did not exceed the DRL or the Action Limit for any radiological emission to water on an annual basis. OPG further stated that the reported emissions for tritium, carbon-14 and beta-gamma have been relatively constant (less than 1% off the DRL) over the licence period. CNSC staff concurred with this assessment.

95. OPG stated that its groundwater monitoring program is comprised of 300 monitoring wells that provide data on groundwater flow, direction and quality. OPG stated that the main concern is the presence of tritium in the groundwater.

96. In addition, OPG stated that three areas associated with fuel oil storage and handling at the standby generators were contaminated by fuel oil from past spills or leaks in the underground network. OPG stated that the extent of the contamination was established and, in 2006, an extraction remediation system was initiated in two of the areas. OPG noted that monitored natural attenuation was selected as the preferred remediation method for the third area.

97. OPG further stated that the groundwater at the east construction landfill continues to be monitored as required by the MOE. OPG stated that no significant changes in the groundwater have been detected and there is no indication that the landfill poses any environmental risk.

98. CNSC staff stated that it requested OPG to report on its efforts to control the tritium releases to the groundwater. CNSC staff further stated that it found OPG's response adequate, and is planning more detailed follow-up inspection activities. CNSC stated that it continues to focus inspection effort on monitoring releases.

Conventional Emissions

99. OPG provided information concerning its conventional emissions, including acid gas, carbon dioxide, hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs), hydrazine, ammonia, sulphuric acid, copper, zinc, mercury and lead. OPG reported that the releases of these emissions were all low, with many levels decreasing over the licence period.

100. OPG also provided information concerning its involvement with the National Pollutant Release Inventory, an Environment Canada initiative, as well as the regulations prescribed by the Municipal Industrial Strategy for Abatement.

Conclusion on Environmental Protection

101. Based on the above information, the Commission is satisfied that facility operations are effectively controlled with the environmental management program and mitigation measures in place, and that they do not pose an unreasonable risk to the health and safety of persons or the environment.

Design and Analysis

102. 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.

103. CNSC staff stated that, overall, OPG's Design and Analysis safety area documentation meets requirements. CNSC staff further stated that the implementation of this safety area was below requirements, but noted that there has been an improving trend in recent years.

Safety Analysis

104. OPG stated that safety analyses are performed for power reactors to verify that regulatory requirements are met, to define the safe operating envelope for reactors, and to verify that special safety systems can perform their mitigating role for design basis accidents. OPG outlined its safety analysis, which is covered by the following areas:

- Safety Report;
- Site Specific Issues;
- Safe Operating Envelope;
- Fuel Management;
- Fuel and Fuel Channels;
- Heat and Transport System Ageing Program;
- Risk and Reliability Program; and
- Research and Development.

105. CNSC staff stated that the safety analysis program area meets requirements and the implementation of this program area met requirements over the licence period. CNSC staff noted that there was a deteriorating trend over the licence period, and the implementation of this program area is currently below requirements.

106. CNSC staff covered the following key areas of implementation that led to the deteriorating trend:

- Shutdown Systems Effectiveness – Large Break Loss of Coolant Accident (LBLOCA) Safety Margins;
- Impact of Plant Ageing on Trip Coverage;
- 28-Element Fuel String Core Heat Flux (CHF); and
- Safety Report Update.

107. With respect to the shutdown systems effectiveness, CNSC staff explained that a number of issues have arisen, and restrictive operating limits had to be implemented to preserve safety margins. CNSC staff noted that, although some progress has been made, several key issues remain to be addressed. CNSC staff stated that it will continue its evaluation of the development of a new safety analysis methodology called "best estimate analysis and uncertainty" and its application to a loss of coolant accident. CNSC staff noted that it is expected that the new analysis methodology would be able to demonstrate improved safety margins.

108. With respect to the impact of plant ageing on trip coverage, CNSC staff stated that it has expressed concerns about ageing management, and OPG needs to develop a program to monitor the effects of ageing, as well as mitigation plans. CNSC staff noted that OPG is of the position that the safety margins in the original plant design are large enough to compensate for the adverse impact of plant ageing, but CNSC staff requires that this issue be subjected to an in-depth technical review. CNSC staff stated that a progress update regarding the review of the new neutron overpower analysis will be provided to the Commission in November 2008.

109. Several intervenors expressed concerns with respect to uncertainties regarding the safe operation of an ageing facility. CNSC staff stated that there are currently end-of-life criteria for all major components, and the frequency of periodic inspections will be done in accordance with the age of the components. CNSC staff explained that it takes into consideration the expected end-of-life of the components when it schedules inspections in order to ensure that a component will not reach its end-of-life.

110. With respect to the discrepancy in the 28-Element Fuel String Core Heat Flux (CHF) experiments, CNSC staff stated that new data from the CHF test program showed a reduction in critical channel powers. CNSC staff stated that it will review the acceptability of this new data and expects to present an update to the Commission in November 2008.

111. CNSC staff stated that the Safety Report underwent several updates over the licence period. CNSC staff stated that it completed its review of the Safety Report Update and identified shortcomings related to the level of detail of the information on analyses assumptions and inconsistencies in these assumptions. CNSC staff stated that OPG has been requested to address these shortcomings and submit a plan and schedule to evaluate and characterize inherent conservatisms in the current safety report analysis. OPG is expected to correct inconsistencies in assumption and analysis. CNSC staff further noted that OPG has proposed to incorporate improvements in the overall quality of the Safety Report and to address issues to the extent practicable in the 2011 edition of the Safety Report Update.

112. In its intervention, Greenpeace expressed concerns regarding the deficiencies identified by CNSC staff in the Safety Report Update. Greenpeace expressed the opinion that any declining safety margins must be addressed for the continued operation of the Pickering B NGS. Greenpeace stressed the importance of transparency regarding the assessment of the safety analysis of the Pickering B NGS due to the age of the NGS. Greenpeace also stressed that an End-of-Life plan is required for the NGS.

113. The Commission asked for more information concerning OPG's plan to address the issues related to the Safety Report Update. OPG responded that it will be working with the industry and with the CNSC to address the issues. OPG noted that some of the issues are generic, industry issues and others are more specific to the Pickering B NGS.

114. The Commission expressed concern with the downward trend in the safety analysis, and sought further information on the matter. Several intervenors also expressed concerns regarding the adequacy of the safety report. OPG stated that it is committed to resolving the issues, and the work it has done has demonstrated that the current safety margins are adequate. CNSC staff concurred that the current safety margins are adequate.

Safety Issues

115. 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).

116. CNSC staff reported that OPG's safety issues 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.

117. CNSC staff stated that a detailed report of the status of GAIs was made available to the Commission and noted that eight GAIs pertaining to the Pickering B NGS remain open. CNSC staff noted that OPG has requested the closure of five GAIs, and CNSC staff is reviewing the closure requests and supporting documentation.

118. The Commission sought further information on the subject of the outstanding safety issues. CNSC staff responded that it sometimes opens GAIs for emerging issues but more are being closed than opened. CNSC staff further explained that a program intended to arrive at a risk-informed position of all outstanding safety issues, including GAIs, has been initiated, with the total number of outstanding safety issues at approximately 73. CNSC staff noted that GAIs are a subset of those safety issues, and not all of those issues are risk-significant.

119. The Commission inquired as to when CNSC staff expects to close all 73 items. CNSC staff responded that the focus for the next five years will be on the safety significant ones. CNSC staff stated that for GAIs, closure criteria are clearly established, including the schedule, and the remaining issues will be addressed later, in consultation with industry and based on research findings. CNSC staff stated that it will be discussing the industry-wide approach to GAIs at the June 2008 Commission public meeting, when it presents the "Annual CNSC Staff Report for 2007 on the Safety Performance of the Canadian Nuclear Power Industry."

Design

120. OPG stated that all design changes are prepared and executed in accordance with the OPG Engineering Change Control (ECC) process, which is governed by OPG programs and procedures. OPG described its plant design based on configuration management, environmental qualifications and additional projects, which include auxiliary power supply, standby generator upgrades, boiler divider plate modifications, liquid zone control pumps and dedicated firewater pumps.

121. CNSC staff stated that the design program documentation meets requirements, but the implementation was below requirements for much of the licence period. CNSC staff noted that there was an improving trend by the end of the licence period, however, and the implementation currently meets requirements.

122. CNSC staff stated that the August 14, 2003 blackout highlighted several design deficiencies in some plant systems. CNSC staff stated that it performed a focused inspection that highlighted problems that OPG was required to resolve. CNSC staff noted that these issues have been a major influence on plant design change.

123. CNSC staff stated that the inability to cool down the units following a loss of all power was the primary reason that the design program implementation was below requirements. CNSC staff noted that OPG installed an interim power supply to provide sufficient power for cooling of one unit should a loss of off-site power occur and the need arises for the cooling of a single unit.

124. CNSC staff stated that OPG instituted the '85/5 & Thrive' improvement initiative during the licence period, which was meant to improve the material condition at the Pickering B NGS. CNSC staff explained that it refers to a goal of 85% capacity factor and 5% forced loss rate. CNSC staff stated that since the program began, there has been a noticeable improvement in the material condition at the plant.

Conclusions on Design and Analysis

125. On the basis of the information presented, the Commission concludes that the design of the Pickering B NGS 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.

126. Furthermore, the Commission is of the view that OPG's planned activities to improve the implementation of its programs related to Design and Analysis are necessary for the ongoing operation of the Pickering B NGS. 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 that any deficiencies are corrected in a timely and efficient manner. The Commission expects that CNSC staff will continue to monitor OPG's progress in this regard.

Equipment Fitness for Service

127. CNSC staff explained that Equipment Fitness for Service is comprised of four program areas:

- Maintenance;
- Structural Integrity;
- Reliability; and
- Environmental Qualification.

128. CNSC staff reported that OPG'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

129. OPG stated that the priorities of its maintenance program are to:

- improve worker safety;
- improve quality of work standards;
- improve productivity;
- establish a culture that promotes ownership;
- demonstrate leadership in error prevention;
- maintain qualifications, skills and experience levels.

130. OPG provided details concerning the results of its maintenance program.

131. CNSC staff reported that OPG'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 has been an improving trend over the licence period due to the reduction of the maintenance backlog.

132. CNSC staff stated that in 2003 it conducted an evaluation of maintenance performance at the Pickering B NGS and raised several areas requiring improvement. CNSC staff stated that OPG submitted an improvement plan, which was accepted by CNSC staff. CNSC staff stated that it identified the following four areas requiring action:

- reducing the operating and shutdown corrective maintenance backlog;
- implementing the preventative maintenance change requests from the Expert Panel Review;
- reducing the number of maintenance procedures which require upgrade; and
- fully implementing the requirements of instrument calibration procedures.

133. CNSC staff, noting the difference between "corrective maintenance" and "elective maintenance", stated that although there has been an improvement in the reduction of the corrective maintenance backlog, the current number is still too high for the elective maintenance backlog. CNSC staff stated that it is satisfied with the progress of the reduction and it will continue to monitor this progress. CNSC staff stated that it is satisfied with the resolution of the other three areas.

134. OPG stated that it will continue to work towards reducing the elective maintenance backlog to its long-term target of meeting industry benchmarks.

Structural Integrity

135. OPG stated that it has the following three programs for structural integrity:

- the Periodic Inspection Program;
- the In-service Inspection Program; and
- the Predictive Maintenance Program.

136. OPG presented the results of these programs as they relate to nuclear plant and containment components, steam generators, pressure tubes, reactor feeders, pipe wall thinning, heat exchangers, valves, and predictive maintenance. OPG further noted other programs, including mussel abatement and integrated ageing management. OPG also discussed its improvement plans for several areas.

137. CNSC staff reported that OPG'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.

138. CNSC staff presented its assessment of OPG's implementation of the structural integrity program area, which includes:

- compliance with the Pressure Boundary Program;
- periodic inspections of CANDU nuclear power plant components;
- inspections and testing of containment structures and containment components;
- feeder pipe ageing management;
- steam generator life-cycle management;
- pressure tube and fuel channel ageing and life-cycle management;
- relief valve testing; and
- inspections of high energy non-nuclear side piping systems.

139. CNSC staff stated that it was satisfied with OPG's performance in all areas.

140. The Commission sought further information concerning the analysis for the Pipe Wall Thinning Program. OPG responded that it uses the most conservative analysis, and repairs or replacements are scheduled before the minimum code allowable thickness is reached. CNSC staff confirmed that the most conservative analysis uses the minimum allowable wall thickness and, as long as the minimum wall thickness is available, the element is considered fit for service.

141. The Commission asked why OPG had reverted to using scrape sampling as a primary method of hydrogen isotope concentration measurements for pressure tubes rather than the Terminal Solid Solubility tool. CNSC staff stated that scrape sampling is an established methodology that gives accurate results, as opposed to the high variability of the data generated by the Terminal Solid Solubility tool.

142. F. Greening, in his intervention, expressed concerns that the feeder pipe design and thickness are not robust. The Commission sought further information in this regard. OPG responded that the issues raised by the intervenor are all addressed in the life-cycle management plan for feeders. CNSC staff stated that it monitors the pipe thinning, and it is satisfied with the manner in which OPG has addressed the issue of testing and inspecting feeder pipes.

Reliability

143. OPG outlined the objectives of its reliability program, which are to:

- test the safety related systems at a suitable frequency to demonstrate that the systems meet reliability targets;
- trend the reliability of systems and components to identify the need for changes to maintenance programs and changes to design; and
- report the results of the testing program to the CNSC.

144. OPG stated that the three indices it uses for measuring and assessing safety system performance and reliability are predicted future unavailability, actual past unavailability and operational past unavailability.

145. OPG further described the results of its reliability program over the licence period.

146. CNSC staff reported that OPG'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.

147. CNSC staff presented information to the Commission concerning reliability failure data, unavailability of systems important to safety, mandatory safety system tests, reliability reporting and the probabilistic risk assessment (PRA).

148. CNSC staff stated that OPG has shown acceptable performance in all of the areas in the reliability program area, noting improvements to the unavailability of systems important to safety due to corrective actions.

149. CNSC staff further stated that it is currently reviewing the PRA and noted that the submission of the PRA is a major accomplishment. CNSC staff stated that the target completion date for the review is January 2009.

Equipment Qualification

150. CNSC staff stated that the equipment qualification program area relates to plant-specific functional and performance requirements that ensure that systems, structures and components ate suitable for operation.

151. CNSC staff reported that OPG's equipment 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.

152. CNSC staff stated that it reviewed OPG's performance related to environmental qualification, seismic qualification and fire protection.

153. CNSC staff stated that a 2005 inspection of OPG's environmental qualification program raised five action notices and five recommendations. CNSC staff stated that OPG's response to the inspection findings has been acceptable, except for one action notice. CNSC staff further noted that it is following up on issues related to steam relief valves and steam barriers. CNSC staff stated that there is reasonable assurance that OPG's environmental qualification program will continue to meet requirements.

154. CNSC staff also stated that OPG has submitted notification of the completion of all actions raised in the "Fire Safety Assessment".

Conclusions on Equipment Fitness for Service

155. The Commission is satisfied with OPG'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 Pickering B NGS is fit for service.

Emergency Preparedness and Fire Protection

Emergency Preparedness

156. OPG stated that the objective of its emergency preparedness program is to coordinate the implementation and maintenance of an effective emergency response capability as described in the OPG Consolidated Nuclear Emergency Plan (CNEP). OPG stated that it has maintained a comprehensive drill and exercise program.

157. OPG stated that its performance is routinely reported using the following CNSC performance indicators. OPG reported values for the licence period, which are averaged below:

- Radiological Emergencies Performance Index (97.8%);
- Emergency Response Organization Drill Participation Index (99.5%) ; and
- Emergency Response Resources Completion Index (99%).

158. CNSC staff stated that it receives and evaluates the Quality Operations Reports and the Report on Performance Indicators on a quarterly basis. CNSC staff reported that OPG'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.

159. CNSC staff stated that Revision 7 of the CNEP was included as part of OPG's Pickering B NGS licence renewal application. CNSC staff stated that this revision is acceptable and is currently referenced in the current Pickering B NGS PROL. CNSC staff noted that Revision 8 of the CNEP has since been submitted for approval. CNSC staff stated that it is satisfied with Revision 8 and recommended that the Commission approve the reference and include Revision 8 as part of the proposed licence renewal.

160. CNSC staff stated that it conducted several inspections over the licence period, and noted that two action notices were initiated during one of the inspections.

161. CNSC staff reported that OPG's response to actual events over the licence period has been acceptable. As an example, CNSC staff noted that the most recent event related to emergency preparedness was a hydrogen leak from Unit 6 in 2004. CNSC staff stated that this event was reported to the Commission as a Significant Development Report (SDR), and CNSC staff was satisfied with OPG's response.

162. CNSC staff noted that OPG has several improvement plans for emergency preparedness, including equipment upgrades and ongoing community relations.

163. Several intervenors expressed concerns in the area of emergency preparedness. The intervenors were concerned with issues such as seismic events, terrorism and the installation of sirens in the region.

164. On the matter of seismic qualification, CNSC staff stated that the Pickering B NGS seismic design meets the requirements stipulated in the Canadian Standards Association seismic design standards.

165. The Commission sought further information regarding the installation of sirens. OPG stated that a study was done on the coverage of the area and it was determined that four sirens was an adequate number, and four have been installed. OPG noted that a lot of work remains to be done between the Regional Municipality of Durham and OPG to ensure that when live testing is done, the public is informed so as to not be alarmed. OPG stated that testing is targeted for sometime this year.

Fire Protection

166. OPG stated that its fire protection program is based on Canadian Standards Association CSA N292-1995 "Fire Protection for CANDU Nuclear Power Plants", and is intended to achieve the following goals:

- ensure fires do not significantly increase the risk of radiological releases to the public;
- protect plant personnel from hazards of fires per regulatory requirements;
- minimize the damage to the plant and equipment due to fires; and
- minimize the interruption of power generation due to fires.

167. OPG stated that it implemented several initiatives under the fire protection program related to staffing, training and resources, programs, integrated response capability, and program evaluation and benchmarking. In addition, OPG noted several future improvement plans.

168. CNSC staff stated that in 2005, it reviewed selected elements of fire protection implementation. CNSC staff stated that the Pickering B NGS fire protection improvement program has been largely completed, although some questions remain related to the adequacy of fire water capacity for certain design basis events.

169. CNSC staff stated that during its review of the Emergency Service Water capacity as a follow up to the Loss of Bulk Electrical Supply (LOBES) event (the August 14, 2003 black-out event), CNSC staff confirmed that sufficient fire water must be available to fulfill the needs of a design basis fire in addition to the other Emergency Service Water needs when the Class III Standby Generators become available, without operator intervention. CNSC staff stated that OPG has confirmed that the Class III service water pumps would supply sufficient water demand including water for fire protection. CNSC staff stated that it is currently reviewing OPG's submission.

170. The Commission asked whether more recent fire standards should be referenced in the proposed licence. CNSC staff responded that the implementation of the CSA standard N293-07 “Fire Protection for CANDU Nuclear Power Plants” could be in place as of March 2010.

Conclusions on Emergency Preparedness and Fire Protection

171. Based on the above information, the Commission is of the opinion that facility operations with the fire protection measures and emergency management program in place will not pose an unreasonable risk to the health and safety of persons or the environment, in consideration of the CNSC mandate and jurisdiction with respect to safety from the nuclear activities as defined by the NSCA.

Public Information Program

172. OPG stated that its public information program manages communications and relationships between Pickering B NGS and its host communities, including Pickering, Ajax, Whitby and east Toronto, by fostering open relationships and sustainable partnerships with community stakeholders, including government, media, business leaders, educational institutions, interest groups and community organizations. OPG further stated that it reaches out to a greater geographical area through means such as mail-outs, its Web site and province-wide advertising. OPG presented an extensive list of program highlights and accomplishments in its continuing community relations and public information activities.

173. CNSC staff stated that the goals, key elements and activities of OPG’s public information program meet requirements. CNSC staff noted that OPG has undertaken several new initiatives to further enhance its public information program.

174. Several intervenors expressed support for OPG’s communication with the community.

175. Based on this information, the Commission is satisfied that OPG’s public information program meets regulatory requirements and is effective in keeping the public informed on the facility operations.

Security

176. OPG stated that its site security program ensures that equipment, procedures and trained personnel are in place to ensure safe and secure operation of the Pickering B NGS. OPG informed the Commission of the improvements that have been made in this area, including better control of the entry of vehicles and personnel, renewal of security clearances for staff and contractors on a rolling schedule, better surveillance systems, and the acquisition and deployment of new and better equipped patrol vehicles.

177. With respect to other site security issues, the Commission was provided with separate, protected CMDs, which were considered in a closed session.

178. The Commission concludes that OPG has made adequate provisions for ensuring the physical security of the Pickering B NGS, and is of the opinion that OPG will continue to make adequate provisions during the proposed licence period.

Non-Proliferation and Safeguards

179. 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 declared nuclear material is in peaceful, non-explosive uses and that there is no undeclared nuclear material or activities in this country.

180. OPG presented its program established to support compliance with the agreement between the Government of Canada and the IAEA. OPG stated that during the licence period, OPG met all safeguards conditions in its operating licences and in the terms of the agreement between Canada and the IAEA. OPG stated that it has fully co-operated with the IAEA and facilitated achievement of IAEA safeguards goals at the Pickering B NGS.

181. OPG further informed the Commission that it works with CNSC staff and the IAEA to develop and implement an integrated safeguards program, and that it continues to implement fuel safeguards with elements of the fuel verification program.

182. CNSC staff reported that OPG'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.

183. CNSC staff stated that OPG 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 OPG provided the IAEA all necessary access and assistance to perform its activities.

184. In the area of non-proliferation, CNSC staff stated that OPG is in conformity with measures required to implement international obligations on export and import controls to which Canada has agreed.

185. Based on the above information the Commission is satisfied that OPG has made and will continue to make adequate provisions in the areas of safeguards and non-proliferation at the Pickering B NGS that are necessary for maintaining national security and measures necessary for implementing international agreements to which Canada has agreed.

Decommissioning Plans and Financial Guarantee

186. 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 Pickering B NGS 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.

187. OPG stated that its financial guarantee is comprised of the following three components:

- segregated funds established pursuant to the Ontario Nuclear Funds Agreement between OPG and the Province of Ontario (the "ONFA Funds");
- a trust fund for the management of used fuel established pursuant to the Nuclear Fuel Waste Act (the "NFWA Trust"); and
- A Provincial Guarantee pursuant to the Provincial Guarantee Agreement between the CNSC and the Province of Ontario, which came into effect on July 31, 2003 (the "Provincial Guarantee").

188. CNSC staff informed the Commission that OPG had submitted revised preliminary decommissioning plans, a revision to the value of the proposed financial guarantee and a revision to the financial guarantee instrument upon which this guarantee is based.[4] CNSC staff added that annual reports on the status of the financial guarantee have been submitted as required by the current licence.

189. Based on the information submitted, the Commission concludes that the decommissioning financial guarantee for the Pickering B NGS is acceptable for the purpose of the proposed licence renewal.

Application of the *Canadian Environmental Assessment Act*

190. Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act*[5] (CEAA) have been fulfilled.

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[4] Refer to the Record of Proceedings on *Financial Guarantee and Licence Amendment for OPG's Class I Nuclear Facility Licences in Ontario*, hearing date November 1, 2007.
[5] S.C. 1992, c. 37.

191. CNSC staff indicated that the application to renew the licence for the Pickering B NGS 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*[6]. 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.
192. Based upon the above assessment, the Commission is satisfied that an environmental assessment under the CEAA is not required for OPG's application for licence renewal.

Licence Length and Conditions

193. OPG has applied to the CNSC for a five-year renewal of its operating licence for the Pickering B NGS. CNSC staff supported the request and recommended that the Commission accept and grant the proposed five-year term. CNSC staff stated that OPG 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 OPG is in good standing for cost recovery and meets the Nuclear Liability Insurance requirements of the *Nuclear Liability Act*[7].

194. Several intervenors representing area municipalities, local government, workers' unions and businesses supported OPG's request and CNSC staff's recommendation for a five-year licence.

195. Other intervenors, including Greenpeace, Citizens for Renewable Energy, J. Brackett, the Pembina Institute, T. Strain and S. Zulauf suggested a two-year licence renewal. Their concerns stem from the possibility of a life extension of the Pickering B NGS reactors, the age of the facility, the need for several significant analyses in order to demonstrate the safe operation of the Pickering B NGS and the lack of an End-of-Life Plan for the NGS. The Provincial Council of Women of Ontario suggested a one-year licence renewal.

196. CNSC staff presented proposed licence amendments for the Pickering B licence. CNSC staff noted in its summary of proposed changes that:

- imprecise clauses have been removed or modified;
- specific licence clauses have been amended to clarify requirements;
- regulatory control of licensing documents has been clarified; and
- references to documents and standards have been updated.

197. CNSC staff also made a recommendation regarding the Delegation of Authority with respect to specific activities included in the proposed licence conditions. CNSC staff noted that the "person authorized by the Commission" would only have the authority to give approvals to the extent that the basis upon which the licence was issued by the Commission remains valid.

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[6] S.O.R./94-636.
[7] R.S., 1985, c. N-28.

198. The Commission asked if OPG is prepared to meet the conditions of the amended licence. OPG affirmed that it is.

199. The Commission asked whether a mid-term report has been foreseen during the proposed five-year licence period. CNSC staff responded that it intends to provide updates to the Commission in the annual industry reports.

200. Due to the level of interest on the matter, by the public and the Commission, the Commission requests that CNSC staff present to the Commission a report regarding the End-of-Life of the Pickering NGS B. The report will be presented at a public proceeding, approximately three months after the expected submission of OPG's proposed End-of-Life Action Plan in December 2009.

201. The Commission expressed concerns that OPG and CNSC staff had not presented adequate planning for the upcoming proposed licence period of five years, including work plans, dates and deliverables. The Commission wanted to ensure that the proper measures and expectations were in place over the licence period. At hearing Day 2, CNSC staff and OPG provided further information to the Commission in this regard.[8]

202. Based on the above information and considerations, the Commission accepts the licence conditions as recommended by CNSC staff. The Commission also accepts CNSC staff's recommendation regarding the delegation of authority, and notes that it can bring any matter to the Commission as applicable.

Conclusion

203. 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.

204. 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.

205. 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.

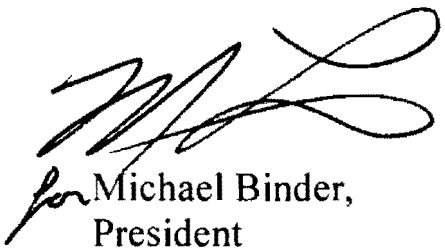
[8] On June 2, 2008, CNSC staff submitted further information to the Commission regarding its Five-Year Plan in a document entitled *CNSC Regulatory Activities – 5-Year Work Plan for Pickering NGS-B.* This document is classified Protected B and is not available to the public.

206. Therefore, the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews Ontario Power Generation Inc.'s Nuclear Power Reactor Operating Licence PROL 08.15/2008 for the operation of the Pickering B Nuclear Generating Station. The renewed licence, PROL 08.00/2013, is valid from July 1, 2008 to June 30, 2013.

207. The Commission includes in the licence the recommendations made by CNSC staff in CMD 08-H4.C and CMD 08-H4.E.

208. The Commission requests that CNSC staff present to the Commission a report regarding the End-of-Life of the facility. The report will be presented at a public proceeding, approximately three months after the expected submission of OPG's proposed End-of-Life Action Plan in December 2009.

209. Furthermore, the Commission expects that a status report on the facility's performance will be provided annually through the Industry Report.



for Michael Binder,
President
Canadian Nuclear Safety Commission

Date of Release of Decision: June 24, 2008

Appendix A – Intervenors

Intervenors	Document Number
Pickering Nuclear Generating Station Community Advisory Council, represented by J. Vincett, D. Hobbs, J. Earley and J. Dike	CMD 08-H4.2
City of Pickering, represented by B. Littley	CMD 08-H4.3
Town of Ajax	CMD 08-H4.4 CMD 08-H4.4A
Jeff Brackett	CMD 08-H4.5
Power Workers' Union, represented by P. Falconer	CMD 08-H4.6 CMD 08-H4.6A
Canadian Nuclear Workers Council, represented by D. Shier and J-A. Usher	CMD 08-H4.7 CMD 08-H4.7A
Society of Energy Professionals, represented by R. Sheppard	CMD 08-H4.8
Citizens for Renewable Energy, represented by J.P. Warren	CMD 08-H4.9
Greenpeace Canada, represented by S-P. Stensil	CMD 08-H4.10 CMD 08-H4.10A
Frank Greening	CMD 08-H4.11
Darlene Buckingham	CMD 08-H4.12
University of Ontario Institute of Technology	CMD 08-H4.13
United Way of Ajax-Pickering	CMD 08-H4.14
Big Brothers and Sisters of Ajax-Pickering	CMD 08-H4.15
Veridian Corporation	CMD 08-H4.16
Ajax-Pickering Board of Trade	CMD 08-H4.17
International Institute of Concern for Public Health	CMD 08-H4.18
Durham Strategic Energy Alliance	CMD 08-H4.19
Provincial Council of Women of Ontario	CMD 08-H4.20
Durham Nuclear Health Committee	CMD 08-H4.21
Organization of CANDU Industries	CMD 08-H4.22
The Pembina Institute	CMD 08-H4.23
Mark Holland, M.P., Ajax-Pickering	CMD 08-H4.24
Teri Strain	CMD 08-H4.25
Michel A. Duguay	CMD 08-H4.26
Sarah L. Zalauf	CMD 08-H4.27
Dan Carter Productions	CMD 08-H4.28
Greenpeace Canada on the release of the Pickering B Probabilistic Risk Assessment Document	CMD 08-H4.29