

# Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant Ontario Power Generation Inc.

Subject Application to renew the Pickering A Nuclear  
Generating Station Operating Licence

Date June 28, 2005

## RECORD OF PROCEEDINGS

Applicant: Ontario Power Generation Inc.

Address/Location: 1675 Montgomery Park Rd., P05A2, Pickering, Ontario, L1V 2R5

Purpose: Application to renew the Pickering A Nuclear Generating Station Operating Licence

Application received: October 22, 2004

Date(s) of hearing: February 24, 2005  
May 20, 2005

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

Members present: L.J. Keen, Chair      A.R. Graham  
C.R. Barnes                      M. J. McDill  
J.A. Dosman                      M. Taylor

General Counsel: J. Lavoie  
Secretary: M.A. Leblanc  
Recording Secretary: P. Bourassa

<b>Applicant Represented By</b>	<b>Document Number</b>
<ul style="list-style-type: none"> <li>• P. Charlebois, Acting Chief Nuclear Officer</li> <li>• J. Coleby, Senior Vice-President of Pickering A</li> <li>• B. Robinson, Senior Vice-President of Pickering A Return to Service</li> <li>• P. Pasquet, Director of Operations and Maintenance</li> <li>• J. Froats, Acting Chief Nuclear Engineer</li> <li>• C. Sellers, Director of Restart Engineering</li> <li>• P. Spekkens, Vice-President, Science and Technology Development</li> <li>• S. Harvey, Vice President, Nuclear Security</li> </ul>	CMD 05-H7.1 CMD 05-H7.1A
<b>CNSC Staff</b>	<b>Document Number</b>
<ul style="list-style-type: none"> <li style="width: 50%;">• I. Grant</li> <li style="width: 50%;">• K. Jones</li> <li style="width: 50%;">• T. Schaubel</li> <li style="width: 50%;">• A. Hughes</li> <li style="width: 50%;">• J. Cameron</li> <li style="width: 50%;">• A. Blahoianu</li> <li style="width: 50%;">• P. Dubé</li> <li style="width: 50%;">• P. Akhtar</li> </ul>	CMD 05-H7 CMD 05-H7.A
<b>Intervenors</b>	<b>Document Number</b>
See Appendix A	
<b>Other Participants</b>	
• N. McKerrell, Chief of Emergency Management Ontario	

Decision and Reasons:

**Licence:** Issued  
**Date of Decision:** May 20, 2005

## Table of Contents

<b>1. Introduction</b> .....	1
<b>2. Decision</b> .....	1
<b>3. Issues and Commission Findings</b> .....	2
<b>3.1 Radiation Protection</b> .....	2
3.1.1 Worker Protection.....	2
3.1.2 Public Protection.....	3
3.1.3 Conclusions on Radiation Protection.....	3
<b>3.2 Conventional Health and Safety</b> .....	4
<b>3.3 Environmental Protection</b> .....	4
3.3.1 Radiological Emissions and Effluents .....	5
3.3.2 Non-Radiological Hazardous Substances .....	5
3.3.3 Conclusions on Environmental Protection.....	6
<b>3.4 Operating Performance</b> .....	6
3.4.1 Organization and Plant Management.....	6
3.4.2 Conduct of Operations .....	6
3.4.3 Reporting.....	7
3.4.4 Technical Surveillance.....	8
3.4.5 Restart Activities.....	8
3.4.6 Conclusions on Operating Performance .....	9
<b>3.5 Performance Assurance</b> .....	9
3.5.1 Quality Management.....	9
3.5.2 Human Performance .....	10
3.5.3 Training, Examination and Certification .....	11
3.5.4 Conclusions on Performance Assurance.....	13
<b>3.6 Design Adequacy</b> .....	13
3.6.1 Safety Analysis .....	13
3.6.2 Safety Issues.....	14
3.6.3 Design .....	14
3.6.4 Equipment Environmental Qualification .....	15
3.6.5 Fire Protection.....	16
3.6.6 Conclusions on Design Adequacy .....	16
<b>3.7 Fitness for Service</b> .....	16
3.7.1 Maintenance.....	16
3.7.2 Structural Integrity.....	17
3.7.3 Reliability of Safety Related Systems.....	19
3.7.4 Conclusions on Fitness for Service.....	20
<b>3.8 Emergency Preparedness</b> .....	20
<b>3.9 Security</b> .....	21
<b>3.10 Non-Proliferation and Safeguards</b> .....	21
<b>3.11 Decommissioning and Financial Guarantees</b> .....	21
<b>3.12 Nuclear Liability Insurance</b> .....	22
<b>3.13 Canadian Environmental Assessment Act</b> .....	22
<b>3.14 Public Information Program</b> .....	22
<b>3.15 Licence Length and Interim Reporting</b> .....	23
<b>4. Conclusion</b> .....	24

## 1. Introduction

Ontario Power Generation Inc. (OPG) has applied to the Canadian Nuclear Safety Commission<sup>1</sup> for the renewal of its Nuclear Power Reactor Operating Licence for the Pickering A Nuclear Generating Station (NGS)-A for a period of five years. The current licence for Pickering NGS-A (PROL 04.07 /2005) expires on June 30, 2005.

The Pickering NGS-A is located in the Province of Ontario on the north shore of Lake Ontario, in the Town of Pickering in the Regional Municipality of Durham. The Pickering NGS-A nuclear facility comprises four 540-megawatts net electrical output CANDU reactors and their associated equipment. The Pickering NGS-A Unit 4 reactor is in operation while the other three reactor units are currently in a shutdown state and preparations are underway to restart Unit 1 reactor. The Commission previously authorized the return to service of Pickering NGS-A following the satisfactory completion of a number of prerequisites set out in the conditions of the current operating licence.

Issues:

In considering the application, the Canadian Nuclear Safety Commission (the Commission) was required to decide, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*, if:

- a) OPG is qualified to carry on the activities that the licence would authorize; and
- b) if, in carrying on those activities, 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:

The Commission, in making its decision, considered information presented in the course of a two-day public hearing held on February 24, 2005 and May 20, 2005 in Ottawa, Ontario. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*. During the public hearing, the Commission received written submissions and heard oral presentations from OPG (CMD 05-H7.1, CMD 05-H7.1A and CMD 05-H7.1B), CNSC staff (CMD 05-H7, CMD 05-H7.A and CMD 05-H7.B) and 72 intervenors (see Appendix A for a detailed list of interventions).

## 2. Decision

Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Proceedings*, the Commission concluded that OPG is qualified to carry on the

---

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

activity that the licence will authorize. The Commission also determined 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*, issues Nuclear Power Reactor Operating Licence PROL 04.00/2010 to Ontario Power Generation Inc., Pickering, Ontario, for the Pickering Nuclear Generating Station (NGS)-A. The licence is valid from July 1, 2005 to June 30, 2010, unless suspended, amended, revoked or replaced.

The Commission includes in the licence the conditions recommended by CNSC staff as set out in the draft licence attached to CMD 05-H7 and in CMD 05-H7.B.

With this decision, the Commission requests that CNSC staff provide the Commission with a report on the performance of the facility at the approximate mid-point in the term of the licence. The mid-term performance report will be presented at a public proceeding of the Commission. Furthermore, the Commission requests CNSC staff to present a report to the Commission on the results of a follow-up International Atomic Energy Agency's (IAEA) Operational Safety Review Team (OSART) inspection of the Pickering NGS-A currently scheduled to occur in September 2005.

### **3. Issues and Commission Findings**

In making its licensing decision under section 24 of the *Nuclear Safety and Control Act*, the Commission considered a number of issues relating to OPG's qualifications to carry out the proposed activities, and the adequacy of the proposed measures for protecting the environment, the health and safety of persons, national security and international obligations to which Canada has agreed. The Commission's findings on these issues are summarized in this section.

The Commission notes that many of the issues examined are interdependent. As such, the findings of the Commission presented below are based on the Commission's consideration of all of the information and submissions available for reference on the record for the hearing.

#### **3.1 Radiation Protection**

##### **3.1.1 Worker Protection**

With respect to the protection of workers from radiation, OPG identified various examples of where it considers it has demonstrated continuous improvement in reducing worker radiation exposures, including improvements within the plant and in radiation protection equipment, self-assessments and training of staff.

The Society of Energy Professionals, in their intervention, expressed their satisfaction with the radiation protection programs and procedures in place to improve the safety environment for both regular and contract staff.

CNSC staff reported that OPG's radiation protection program and its implementation at Pickering NGS-A meet CNSC requirements. CNSC staff also reported that the radiation doses to the workers during the current licence period were consistently below the regulatory limit.

Dr. Greening, in his intervention, raised concern about the potential radiation dose to workers engaged in feeder pipe inspections. Dr. Greening sought more detailed information on the radiation fields present near the feeder pipes and on the radiation doses received by workers conducting the inspections.

In response to the Commission's questions regarding this intervention, OPG acknowledged the need to minimize doses for its inspectors and explained that all inspection campaigns, including those for feeder pipes, are planned and assessed in accordance with the ALARA (as low as reasonably achievable) program. OPG agreed to provide the results of the feeder pipe inspections to Dr. Greening.

### 3.1.2 Public Protection

With respect to protection of the public from the effects of radiation, OPG reported that the estimated doses to the public resulting from the operation of Pickering NGS-A were a small fraction of the regulatory limit defined in the *Radiation Protection Regulations*. CNSC staff concurred with this assessment.

OPG reported that it has been focusing on improving its understanding of the effects of radiation in the implementation of its Health, Safety and Environment Program. As a result, OPG reported that it has made improvements to the measurement and management of radiation fields and emissions to address both worker and public concerns.

Citizens for Renewable Energy, in its intervention, expressed the view that the Derived Release Limits and reported radiation releases to the environment are based on unsubstantiated information and assumptions and, as such, are unreliable. In considering this intervention, the Commission notes that the intervenor did not provide any evidence to support its allegation. The Commission remains satisfied that the risk-informed assessment method used by the CNSC to calculate the release limits and assess public radiation risk from actual releases is appropriate and acceptable.

### 3.1.3 Conclusions on Radiation Protection

Based on the above information and considerations, the Commission concludes that OPG has made, and will continue to make, adequate provision for the protection of persons from radiation at Pickering NGS-A. For further discussions of the Commission's related findings see section 4.3 on environmental protection and section 4.5.3 on staff training.

### **3.2 Conventional Health and Safety**

With respect to the protection of persons from non-radiological hazards at the Pickering NGS-A, OPG reported that the Industrial Safety Accident Rate, a personnel safety indicator for comparison against other world utilities, has been consistently better than target at Pickering NGS-A since 2000, placing Pickering NGS-A in the industry upper quartile. OPG also noted the implementation of an Occupational Health and Safety Management System and of Corporate Safety Rules.

CNSC staff reported that the conventional health and safety program at the Pickering NGS-A meets expectations.

The Power Workers' Union, in their intervention, highlighted the Power Workers' Union and OPG's joint efforts to continually improve safety and noted, as an example, the joint Health & Safety Committee's contribution to the improvements on health and safety performance.

Based on this information, the Commission is satisfied that OPG has made, and will continue to make, adequate provision for the protection of persons from conventional (non-radiological) hazards at the Pickering NGS-A. For further discussions of the Commission's related findings, see section 4.4.4 on safety culture and section 4.5.3 on staff training.

### **3.3 Environmental Protection**

To determine whether OPG will make adequate provisions to protect the environment while carrying out the proposed activities at the Pickering NGS-A, the Commission considered the potential for the continued operation of Pickering NGS-A to adversely affect the environment.

OPG reported that it continues to make progress in implementing its Environmental Action Plan at the Pickering NGS site. The plan identified opportunities for protecting or enhancing the surrounding environment by addressing a variety of social, scientific and technical issues. As a follow-up to the *Ecological Risk Assessment* completed in 2002 as part of the Environmental Action Plan, OPG noted that a long-term verification monitoring program is currently being implemented.

As further evidence of its commitment to environmental protection at Pickering NGS-A, OPG noted that it maintained its ISO 14001 *Environmental Management System* certification and was awarded re-certification by the Wildlife Habitat Council Review Committee in 2004.

Based on its review of OPG's programs to identify, monitor and control releases of nuclear substances from the site, CNSC staff concluded that the environmental performance at Pickering NGS-A meets CNSC requirements. CNSC staff noted that there were no unplanned releases of nuclear or hazardous substances to the environment during the current licence period. Based on its assessment of OPG's annual environmental report, CNSC staff further noted that the

environmental effects of the operations, and the effectiveness of the mitigation measures in place, are as predicted in the earlier environmental assessment<sup>2</sup>.

### 3.3.1 Radiological Emissions and Effluents

With respect to radiological emissions and effluents to the environment, CNSC staff reported that the releases from Pickering NGS-A have consistently been below the derived release limits.

CNSC staff further reported that airborne and liquid releases of contaminants to the environment have been negligible. OPG added that airborne emissions have not exceeded 1% of the derived release limits with the exception of noble gases where precise measurement of the release was limited by the capability of the monitoring instrument. OPG stated that it will install a more sensitive monitoring system which should provide more accurate measurement of noble gas emissions at levels below the Derived Release Limit.

Based on the Pickering Nuclear Groundwater Monitoring System Report, CNSC staff noted that, although tritium is still the primary groundwater contaminant, tritium concentrations have decreased in the past years. CNSC staff remains satisfied that this groundwater contamination is not likely to cause adverse environmental effects on or off the site.

With respect to the off-site monitoring of radiological environmental conditions (which includes the combined effects of Pickering NGS-A and the operating Pickering NGS-B), OPG reported that the concentrations of radioactive substances in local municipal water supplies, air, milk, sediment, soils, fish and terrestrial biota are all at very low, acceptable levels.

### 3.3.2 Non-Radiological Hazardous Substances

With respect to non-radiological emissions, OPG stated that it continues to control and monitor discharges under the Ontario MISA (Municipal Industrial Strategy for Abatement) program. OPG noted that the levels of non-radiological emissions were acceptably low, and that measures were being taken to further reduce or eliminate these emissions.

OPG further noted its commitment to reduce and recycle conventional waste and has reduced its backlog of stored chemical waste.

OPG stated that it plans to phase out and destroy polychlorinated biphenyl (PCB) waste at all of its sites by 2015 and that PCBs had been removed from Unit 4 and disposed of prior to its return to service.

---

<sup>2</sup> The CNSC completed a screening environmental assessment for the current and proposed operations at Pickering NGS-A in 2000, in accordance with the requirements of the *Canadian Environmental Assessment Act* (CEAA). Following a public hearing on the Screening Report, the Commission concluded that the project was not likely to cause significant adverse environmental effects. Refer to the *Record of Proceedings, including Reasons for Decision*, dated February 16, 2001.



### 3.3.3 Conclusions on Environmental Protection

Based on this information, the Commission is satisfied that OPG has made, and will continue to make, adequate provision at Pickering NGS-A for the protection of the environment during the proposed licence period.

## 3.4 Operating Performance

The Commission considered the operating performance at Pickering NGS-A as a further indication of OPG's qualifications to continue operating 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 are described in the following sections.

### 3.4.1 Organization and Plant Management

OPG described the two separate organizational structures that it has created at Pickering NGS-A so that activities to return Unit 1 to service do not impact adversely on the operation of Unit 4 or the safety of the shutdown units. Thus one organization, under the authority of a Site Vice-President, is accountable for the operation of Unit 4 and maintenance of Units 2 and 3. The other, under the leadership of a Senior Vice-President, is accountable for the refurbishment and return to service of Unit 1.

CNSC staff reported that it finds OPG's organization and management structure at Pickering NGS-A to be acceptable. CNSC staff noted in particular the improvements OPG made to the Control Room Shift Operating Supervisor role. CNSC staff also expressed its satisfaction with OPG's Action Tracking system.

Based on this information, the Commission is satisfied that OPG has appropriate organization and management structures in place.

### 3.4.2 Conduct of Operations

CNSC staff reported that, based on a series of CNSC inspections and document reviews, the operations at Pickering NGS-A during the current licensing period were adequately and safely conducted. The Canadian Nuclear Workers' Council, in its intervention, further attested to the overall safe operations of Pickering NGS-A during the licence period.

With respect to operating events, CNSC staff reported that there were two serious process failures due to loss of Class 4 power (in August 2003 and December 2004). Safe shutdown was achieved in both cases. CNSC staff noted that the December 2004 event, caused by switchyard equipment failure, was still under review.

OPG stated that it has been experiencing a recurring problem with the level indication in the liquid zone control system and that long-term corrective action is being investigated. No problems with the system have occurred since the restart of Unit 4 in August 2004. As a

contingency, a spare liquid zone compartment is being prepared for installation during the 2005 planned outage.

OPG also reported that its Reactivity Management Committee assessed two reactivity events during the licensing period. As a result, OPG implemented corrective actions and devised a reactivity management improvement plan.

Greenpeace, in its intervention, listed several other events that had been reported during the licensing period and asked that the Commission also take these events into consideration in its decision. The Commission took these events into consideration and concluded that they did not, and do not currently pose, an unreasonable risk. The Commission notes that while the CNSC takes reportable events very seriously, the reporting thresholds are relatively low so that trends or other precursors to more serious events can be identified, tracked and mitigated as early as possible. The occurrence of minor events can be expected, but this does not necessarily mean a significant risk is present. In this case, the Commission is satisfied that OPG has addressed, or is addressing, the above-noted more serious events in an appropriate and timely manner and that the other events are being monitored appropriately.

With respect to an inspection by the International Atomic Energy Agency's (IAEA) Operational Safety Review Team (OSART) completed in February 2004, OPG indicated that only a small fraction of the recommendations and suggestions were related to operations. In response to Commission questions on OPG's plan to address the issues identified by the OSART, OPG indicated that, by the next planned visit by the OSART in September 2005, 95% of the issues will have been addressed. As a result of the OSART inspection, OPG stated that it has already made significant improvements in its maintenance backlogs and would be raising its housekeeping standards to meet industry best practices. The Commission requested an update report at a Commission meeting following the next OSART inspection.

Regarding work protection, OPG noted that its close monitoring and improved use of the Approved Work Protection Procedures has resulted in an overall reduction in the number of errors. OPG also reported that it continues to make significant progress in reducing the backlog of procedures that require revision.

With respect to outage management, CNSC staff reported that the planned spring 2004 Unit 4 outage had been completed adequately. OPG further noted its effective use of the Outage Control Centre and its plan to improve forced outage readiness and response.

Based on this information, the Commission concludes that the conduct of operations at Pickering NGS-A has been, and will continue to be, satisfactory during the proposed licence period.

### 3.4.3 Reporting

CNSC staff expressed its general satisfaction with OPG's reporting, noting that trend analysis and corrective actions were performed and, when applicable, follow-up investigations were done. CNSC staff concluded that OPG has met the requirements of the CNSC Regulatory Standard S-99, *Reporting Requirements for Operating Nuclear Power Plants*, during the licensing period.

Based on this information, the Commission is satisfied that OPG is meeting and, during the proposed licence period, will continue to meet the CNSC's requirements for reporting at Pickering NGS-A.

#### 3.4.4 Technical Surveillance

With respect to the technical surveillance program, OPG noted that the program included the monitoring of 45 systems against established performance criteria. OPG added that the monitoring plan generates regular system health reports used to improve the plant condition and support outage management, and, as a result, various system health improvements were underway and planned.

In response to follow-up questions from the Commission on OPG's system health assessments in general, OPG described how the assessments were used to grade and assess a system's performance to prioritize maintenance work and document performance trends requiring solution. For example, a system assessed under the program as having a marginal performance would still meet the design intent of that system and would be safe to operate but would require maintenance to improve its performance. In follow-up questions on this, the Commission sought an explanation of the significance of the poor assessment rating that was given to the liquid effluent monitoring system. In response, OPG explained that the current liquid effluent monitoring system, while performing, requires a high level of maintenance due to the age of some components. OPG stated that a new system for the entire Pickering NGS-A facility was planned in the scope of the work to be completed before putting Unit 1 into service.

Based on this information, the Commission concludes that technical surveillance at Pickering NGS-A has been, and will continue to be satisfactory during the proposed licence period.

#### 3.4.5 Restart Activities

With regard to the Unit 1 restart activities, CNSC staff noted that it is providing more frequent regulatory feedback on the effectiveness of the OPG programs as a result of having initiated continual, rather than periodic, CNSC inspections. In accordance with the current conditions of the operating licence, the CNSC staff Designated Officer has the authority to approve the removal of the guaranteed shutdown state at Unit 1 and can authorize the increase in reactor power levels once OPG successfully completes a number of specified prerequisites.

Greenpeace, in its intervention, opposed the delegation of authority to CNSC staff for the restart of the reactors, stating that it minimized the role of the Commission and reduces public involvement. In response to this concern, the Commission noted that it has the ability to delegate authority pursuant to subsection 37(1) of the *Nuclear Safety and Control Act*. In this case, the Commission has established clear criteria that must be met prior to the restart of each unit, thus ensuring that appropriate actions have been taken before any authorization is granted by CNSC staff. In reviewing this matter, the Commission remains satisfied that the delegation of the restart approvals to CNSC staff is appropriate and should remain. The Commission continues to receive periodic reports on the performance of the facility (at least annually) and these are presented at

public proceedings of the Commission. The Commission is not constrained in its ability to take appropriate regulatory action at any time should this be warranted.

In response to the Commission's concerns regarding the number of reactor trips and forced outages that had occurred during the Unit 4 restart, OPG stated that it expects the number of such events to decrease with each subsequent unit restart. In support of this statement, OPG noted that the oversight of the restart activities for Unit 1, including the defining of work scope and integrated scheduling of work, improved significantly as a result of the lessons learned during the restart of Unit 4 and from the implementation of standard performance measures.

### 3.4.6 Conclusions on Operating Performance

Based on the above information and considerations, the Commission concludes that the operating performance at Pickering NGS-A provides a positive indication of OPG's ability to adequately carry out the proposed activities under the licence.

## 3.5 Performance Assurance

As a further indication of the adequacy of OPG's qualifications and protection measures, the Commission examined performance assurance, including aspects of quality assurance, human performance and personnel training.

### 3.5.1 Quality Management

With respect to quality assurance, CNSC staff reported that, while the defined quality assurance program at Pickering NGS-A meets CNSC expectations, problems remain in the implementation of the program. As a follow-up to CNSC's action notices and recommendations, CNSC staff noted that it is currently reviewing OPG's proposed actions for improvement.

Concerned with the low rating for implementation of the program, the Commission sought further clarification on specific CNSC action notices and recommendations. CNSC staff stated that the low rating was based on identified problems with the trending of data in OPG's Problem Identification and Resolution Program and on OPG's failure to have adequate corrective action plans. OPG stated its concurrence with the CNSC staff's assessment and recommendations in this regard and noted its commitment to resolve the issues and improve the implementation of the program. OPG further noted that some of the recommendations from the OSART inspection of the station are relevant to this subject and that OPG would also implement those recommendations for improvement in this area.

With respect to the involvement and accountability of OPG management in the quality assurance program, OPG reported that the program is implemented under the Chief Nuclear Officer's Expectations Charter. The program is also managed and audited under a new Performance Improvement and Nuclear Oversight Division. OPG further explained that the Nuclear Executive Committee is responsible for initiating and managing extensive improvements in the Corrective Action Program, including the establishment of a Corrective Action Review Board of senior

OPG management. OPG also explained how audits and self-evaluations of systems and programs feed into the Corrective Action Program.

As part of its planned improvements, OPG noted a rolling five-year audit schedule subject to independent review and enhanced root cause analytical capability. OPG also explained how its Operating Experience Program allows for exchange and integration of experience with other nuclear generating stations.

#### Pressure Boundary Program:

Following improvements in several key areas since 2002 to resolve longstanding issues of the pressure boundary quality assurance program, OPG reported that a Certificate of Authorization was awarded by the Technical Standards and Safety Authority (TSSA) in October 2004.

#### Conclusions on Quality Assurance:

Based on this information, the Commission concludes that OPG is taking the appropriate action to meet the CNSC's expectations for quality assurance at Pickering NGS-A.

#### 3.5.2 Human Performance

With respect to human performance, OPG provided the Commission with information on its Human Performance Improvement Program. The program focuses on leadership, behaviours and learning organization. Planned improvements include the annual update of the Human Performance Plan to reflect past performance and improvement needs. OPG reported that its tracking of human performance events shows a consistent downward trend in event-free day resets since 2001, and that OPG is targeting a continued downward trend in this indicator until at least 2007.

With regard to other improvement initiatives, OPG noted how it is directly involving senior management in observation and coaching programs, weekly audits and area ownership for housekeeping, benchmarking on use of pre-job briefings, and the integration of human factors in the engineering change process.

CNSC staff reported that OPG's human performance program and its implementation currently meet CNSC expectations. In particular, CNSC staff noted the significant progress that OPG has made in the area of procedural compliance in operations and maintenance.

With regard to specific human performance events, CNSC staff expressed its satisfaction with how OPG completed root cause analyses. However, CNSC staff noted that it remains concerned about the identified deficiencies in the quality and use of trend reports related to the Problem Identification and Resolution Process, as discussed above in section 3.5.1 (Quality Assurance).

The Commission expresses its appreciation of the improved work relationship at the Pickering NGS-A and encourages OPG to continue its improvement initiatives, such as the Action Contributing to Excellence recognition program.

## Safety Culture:

The Commission considered OPG'S safety culture as a further factor affecting quality assurance and human performance at Pickering NGS-A.

In this regard, OPG outlined the objectives of its Safety Culture Program and the progress it has made in developing a Safety Culture Framework and Implementation Guide. OPG further noted the OSART's favourable assessment of safety culture at the facility and OPG's plan to strengthen its safety culture audit and self-assessment program.

The Durham Chapter of Women in Nuclear, in its intervention, attested to what it referred to as a vibrant safety culture at Pickering NGS-A.

The Commission sought further information on the key factors that have led to OPG's apparent success in fostering a good safety culture at Pickering NGS-A. In response, CNSC staff stated that, in its assessment, Pickering NGS-A is representative of a high reliability organization where repeatable, excellent performance is expected and achieved. CNSC staff also noted that workshops held with the industry demonstrate that a great deal of work has been done to implement safety culture within the Pickering NGS-A organization. OPG identified the engagement of the workers, improved communication, and improved leadership by OPG management as key contributors to its success in this area. Regarding worker morale and its effect on safety culture, OPG noted this is an area that needs continuous work and stated its commitment to address issues as they arise in cooperation with local unions. In this regard, the Society of Energy Professionals attested to the significant progress made in this area and to the on-going cooperation that exists with OPG through their involvement on safety committees.

Based on this information, the Commission is satisfied that OPG is taking the appropriate steps to develop, foster and monitor a positive safety culture at Pickering NGS-A.

### 3.5.3 Training, Examination and Certification

The Commission considered the adequacy of OPG's programs for personnel training, examination and certification as a further indication of OPG's qualification to carry out the proposed activities under the licence, and to maintain that qualification.

In addition to having successfully applied the Systematic Approach to Training (SAT) methodology in various training areas, OPG stated that SAT was now introduced to the Shift Manager and ANO training programs to address identified deficiencies. OPG added that planned improvements to continuing training and testing of certified staff leading to re-certification of staff, as well as return-to-service training activities, are on schedule to address the remaining deficiencies.

CNSC staff reported its satisfaction with OPG's training, examination and certification programs indicating that, despite some deficiencies, requirements and performance expectations are being met. CNSC staff has identified these deficiencies in certain areas of OPG's training programs with respect to the Authorized Nuclear Operator (ANO) Initial Specifics and Initial Simulator

Skills Training Programs and the Requalification Written Testing as well as in station documentation. OPG is addressing those deficiencies and has already completed the required improvements to an operating manual regarding the above-noted documentation deficiency.

The Power Workers' Union (PWU), in its intervention, expressed its satisfaction with regard to training at Pickering NGS-A. The PWU noted in particular that OPG implementation of project crews is, in its opinion, an effective, efficient and safe way for OPG to decrease its dependence on contract staff. Project crews, staffed with experienced workers and new employees in a 4:1 ratio, ensure the work performed on Units during planned outages is done by qualified, full-time regular employees that generally have a higher degree of familiarity with the equipment and plant. The PWU also expressed its support for OPG's skill broadening provisions which it considers improve plant safety by having workers that are better trained and able to make repairs quickly and efficiently. The PWU also recognized the work to be done in order to meet the challenge of providing a sufficient complement of fully trained and certified staff. The Society of Energy Professionals (SEP) also expressed its support for, and participation in, OPG's safety training.

The Commission expressed its appreciation for the interventions by the union representatives, noting the importance of having the workers' views on training and safety presented at licensing hearings.

In response to the Commission's concern regarding the training schedule for Unit 1, OPG noted that workers are currently being trained on Unit 4, which is a replica of Unit 1, and that authorized staff is rotating between units. This allows for hands-on training and ensures that experienced staff is available for restart. OPG noted that the training prior to the restart of Unit 4 took longer because an identical operating unit was not available to assist in the hands-on aspects of the training.

#### Staffing:

Noting the linkage between human performance and adequate staffing in an organization, the Commission questioned OPG on its plans for recruitment and training.

In response, OPG stated its staffing plan is in step with the unit restart process, noting that sufficient trained staff is currently available for the Unit 1 restart. OPG further noted its success in hiring new staff in most fields of expertise, except in the trades areas. As a result, OPG initiated its own trades apprenticeship program to address this area. CNSC staff added that, in accordance with the licence condition for minimum staff complement, no approval to restart would be given until sufficient qualified staff is available.

In their interventions, both SEP and PWU expressed their satisfaction with OPG's hiring efforts, succession planning and reduced reliance on contract staff. The Canadian Nuclear Workers' Council, in its intervention, attested to OPG actively hiring young workers into positions such as mechanical maintenance, control maintenance and operators-in-training, as well as the hiring of women in non-traditional fields.

The Commission is satisfied with OPG's efforts and success to renew the work force at Pickering NGS-A, thereby serving to maintain qualified and experienced staff.

Based on this information, the Commission is satisfied that OPG has adequate training, examination and certification processes in place for the purpose of maintaining its qualifications during the proposed licence period.

#### 3.5.4 Conclusions on Performance Assurance

Based on the above information and considerations, the Commission concludes that OPG has in place the necessary programs to assure continued acceptable performance at Pickering NGS-A.

### 3.6 Design Adequacy

Many aspects of safety performance at a nuclear facility are inherent in the design of the facility and the ability of plant systems to continue to meet the design intent in light of new information, operating experience, revised safety analyses, and continuing research on standing safety issues. In this regard, the Commission examined during the hearing issues related to the Safety Analysis, the progress in resolving Generic Action Items (safety issues), and the adequacy of the design and design modifications. The objective was to assess the adequacy of the remaining safety margins afforded by the design.

#### 3.6.1 Safety Analysis

With respect to Safety Analysis, CNSC staff reported that during the licensing period OPG had maintained adequate safety analyses and updates of the Safety Report.

Regarding Large Break Loss of Coolant Accident (LBLOCA), CNSC staff reported that, despite some generic issues that remain under review, it is satisfied with OPG's analysis for Pickering NGS-A. OPG stated that, in addition to having addressed all identified issues, it continues to work with CNSC staff on additional supporting analysis for LBLOCA issues related to the Compliance Strategy for Channel-specific Limits, the Revised Design Basis for Shutdown System "A" Neutron Overpower System and the Operation with Flux Tilts.

The Commission sought assurances that the revised LBLOCA analysis was consistent with the proposed licence condition that would place limits on the total power generated in any one fuel bundle and in any fuel channel. In response, CNSC staff confirmed that the licence condition could be met and added that the licence condition specifies single values while the Operating Policy and Procedures define the power values further.

CNSC staff reported that, although it is satisfied with the assessment and measures taken by OPG regarding core stability and flux tilts, an outstanding design issue remains with respect to the low range of zone control system reactivity worth.



CNSC staff noted that it has requested, and OPG has committed to, a further confirmation of results of previous design analyses of the neutron overpower trip coverage based on the Industry Standard Toolset (IST) codes and results of recent commissioning measurements.

With respect to reactor physics computer codes used in the safety analysis, OPG noted that a comparison study has demonstrated that the old and new reactor physics toolsets continue to produce similar results. In response to follow-up questions from the Commission on this comparison, OPG confirmed that no significant differences were found in between the different toolsets.

Based on the above information, the Commission concludes that the Safety Analysis for Pickering NGS-A is acceptable for the purpose of the licence renewal and that the processes for maintaining the Safety Analysis are acceptable.

### 3.6.2 Safety Issues

With respect to the standing safety issues that are generic to the CANDU reactor designs, i.e. , Generic Action Items (GAI), CNSC staff noted its satisfaction with the progress made to address these in respect of Pickering NGS-A.

OPG provided further details on the status of the GAIs related to the hydrogen behaviour inside the calandria vault, error in trip coverage reported in the Safety Report, and the modifications to reduce core damage frequency.

With respect to research and development, OPG noted several projects that are underway within the CANDU Owners Group (COG) that are aimed at improving the understanding of safety design basis and safe operating envelope for CANDU plants, including the resolution of GAIs.

Based on this information, the Commission is satisfied that the remaining GAIs do not represent an impediment to the granting of the proposed licence renewal. The Commission expects, however, that the industry will maintain a concerted and sustained level of effort in resolving these issues.

### 3.6.3 Design

OPG summarized the principal design upgrades to the facility and the status of their completion. Most deliverables under the multi-part Configuration Management Closure Project (CMCP) to establish the configuration management baseline for selected safety-related systems are complete. OPG further reported on the status of a series of modifications to Unit 4 that are being completed as part of the Shutdown System Enhancement. Those changes are intended to improve the existing capability of the shutdown systems and are a prerequisite for the restart of each unit. 85% of that work was complete for Unit 1 at the time of this hearing.

In assuring that the design of a facility is in line with modern standards and practices, CNSC staff reported that the design of Pickering NGS-A was compared against modern standards and practices and that, as a result, some modifications were made and incorporated into the *Basis for*

*Return to Service* document. CNSC staff reported that it has found those modifications to be acceptable.

OPG noted that COG was undertaking further research in support of aging and life extension issues related to the re-establishment of operating margins.

With respect to the design of the secondary shutdown system, Citizens for Renewable Energy questioned its reliability noting that Pickering NGS-A does not have the same emergency system protection as the newer plants. Greenpeace expressed similar concerns over what it views as the absence of a completely independent second fast shutdown system.

In response to the Commission's request for clarification on this issue, CNSC staff stated that the secondary shutdown system was designed as an enhancement of the original shutdown system A (shutoff rods). CNSC staff added that, while it is not an entirely independent shutdown system, it serves the purpose of an independent shutdown system and it meets the CNSC's safety requirements.

Based on this information, the Commission is satisfied that OPG is making, and is expected to continue to make during the proposed licence period, the necessary and appropriate changes to the design of Pickering NGS-A.

#### 3.6.4 Equipment Environmental Qualification

It is important to continually assess and verify that important safety equipment in the plant will function as designed in the harsh environments that could arise during accident conditions. In this respect, CNSC staff reported that, for the most part, OPG has complied with the equipment environmental qualification licence condition, has met acceptance criteria and has an equipment Environmental Qualification (EQ) program in place. CNSC staff stated the delay to complete the remaining condition and environment monitoring programs was not significant and added that it would be periodically examining the effectiveness of these programs.

OPG confirmed that the EQ program and supporting documentation is in place to ensure that equipment environmental qualification is complete and maintained for the life of the plant. OPG further noted that all qualifications for Unit 4 were completed and that all other units would be qualified prior to return to service.

CNSC staff stated that it would be reviewing OPG's design solutions to address problems identified in the H-line wall that provides steam separation between the turbine hall and the reactor auxiliary bay. OPG noted that the environmental qualification of the critical equipment was still assured although repairs and modifications are underway to resolve the problems.

The Commission is satisfied with the environmental qualification process at Pickering NGS-A. The Commission concurs with CNSC staff, however, that the proposed licence condition is necessary to ensure that progress is maintained and that this important design program be sustainable in the long term.

### 3.6.5 Fire Protection

With respect to fire protection in the design of the facility, OPG reported on several improvements and upgrades that it made during the current licence period. OPG noted in particular the completion of its Fire Protection Upgrade Project where a complete fire safety assessment of the site was performed for code compliance review, fire hazard analysis and fire safe shutdown analysis.

Regarding fire protection response, OPG noted it has a dedicated Fire Protection Department in place and that its Emergency Response Team is trained for industrial firefighting. OPG also noted that it hold regular meetings and performs fire drills with the Pickering Fire Service. Incident Command Training is provided to both OPG and City of Pickering staff.

With respect to OPG's Fire Protection Performance Index and the reported significant weaknesses in the Fire Systems Health, the Commission inquired as to what OPG has done, or is doing to address those weaknesses. In response, OPG noted that the identified weakness pertained to ancillary buildings constructed to support the restart, and that those buildings did not have fire detection active in them. OPG stated that the situation has now been corrected.

OPG also stated its commitment to continuous improvement and maintenance of high standards for fire protection, including with respect to implementing the OSART recommendations for improvement in this area.

Based on this information, the Commission is satisfied that adequate design provisions are being made to ensure that Pickering NGS-A has the necessary fire protection measures.

### 3.6.6 Conclusions on Design Adequacy

On the basis of the information and reasons stated above, the Commission concludes that the design of Pickering NGS-A is adequate. The Commission is also satisfied that OPG has continued to modify the facility design in an appropriate and timely manner in response to new issues and as new information becomes available.

## 3.7 Fitness for Service

In addition to considering the adequacy of the facility design (as discussed in the foregoing section), the Commission considered whether OPG is maintaining fit-for-service the critical components of that design. This includes an examination of OPG's maintenance program, the monitoring and maintenance of the structural integrity of key components, and the reliability of special safety systems.

### 3.7.1 Maintenance

CNSC staff reported that OPG's maintenance program and its implementation fully meet CNSC requirements and expectations. CNSC staff stated that it has accepted OPG's targets for

corrective and preventive maintenance prior to unit return to service and is satisfied with the progress made to deal with the backlog of required changes to maintenance procedures.

OPG noted several improvement initiatives to reduce maintenance backlogs including improved work management process, effective use of fix-it-now work teams, improved pre- and post-job briefings, and tracking and trending the causes of repeated work.

In response to the Commission's questions on the current maintenance backlog, OPG noted that, as of the time of this hearing, elective and corrective maintenance backlogs are better than target and have been considerably lower than past years. CNSC staff added that it is satisfied with the maintenance backlogs and is of the view that OPG will be able to maintain this performance.

With respect to preventive maintenance, OPG reported that its Preventive Maintenance Optimization Program to improve equipment reliability and availability is being implemented. The program is designed to be dynamic and responsive to feedback through the Preventive Maintenance Living Program.

### 3.7.2 Structural Integrity

As a facility ages, it is important to continually assess the structural integrity of key components that are important to safe operations. CNSC staff noted that the structural integrity assessment program at Pickering NGS-A focuses primarily on pressure tubes, feeder pipes and steam generator tubes. CNSC staff stated that, overall, OPG's structural integrity program and its implementation meet CNSC requirements.

Citizens for Renewable Energy and Greenpeace, in their interventions, expressed concerns over the age of the reactors and possible need for replacement of major components.

Kinectrics, in its intervention, attested to OPG's exercise of due diligence in support of its facilities and the restart of Pickering NGS-A specifically with respect to equipment and component inspections and replacements.

CNSC staff added that periodic inspections were carried out on pressure retaining components for degradation or wear-out, or both. Supplementary inspection programs for specific components are described in the following paragraphs.

#### Steam Generators:

OPG reported on its Chemical, Materials and Components Program which encompasses a variety of issues and disciplines that impact on the major station systems and components. OPG stated that it has made significant achievements under that program with respect to steam generator issues during the current licence period. OPG noted that improved tube cracking detection methods would be applied during the next outage.

CNSC staff reported that the Unit 4 generators were approved for 22 effective full power (EFP) months with a restriction to inspect the sleeve/feedwater nozzle region of selected generators

after six EFP months. CNSC staff also stated that chemical cleaning of the Unit 4 steam generators was deferred until the next planned outage as the integrity of the generator tubes and support structure were deemed acceptable by CNSC staff.

Citizens for Renewable Energy, in its intervention, expressed concern that the steam generators were old and not safe for operation and questioned why the Steam Generators Life Cycle Management Plan had been deferred.

In response to the Commission's questions regarding the intervenor's concerns, OPG stated that while the steam generators are the original units installed during the construction of the facility, extensive inspections are performed periodically to ensure they remain fit for purpose. CNSC staff confirmed that inspection requirements are in place and that the results, which are routinely reviewed by CNSC staff, indicate that the fitness criteria are being met. With respect to the repairs made on steam generator tubes, OPG stated that Pickering NGS-A is well below the administrative limit for the number of tubes that can be plugged (50 per generator per quadrant) and some of the generators have had no tubes plugged.

#### Pressure Tubes:

CNSC staff stated that it was currently reviewing the revised version of OPG's Fuel Channel Aging and Life Cycle Management Strategy and Plan to ensure that pressure tube ageing continues to be adequately managed at Pickering NGS-A.

OPG reported that the fuel channel inspection (CIGAR) of 20 channels in Units 1 and 2 were completed and that no significant flaws had been discovered. Fuel channel elongation measurements were also complete for Units 1 to 3 and the result showed all channels will be within bearing travel limit up to the re-configuration time. OPG further noted the significant progress it has made in research and development for the Fuel Channel Program to improve the assessment of pressure tube fitness for service.

#### Reactor Feeder Pipes:

CNSC staff reported that following recent findings of unexpected localized thinning of welds in two Unit 1 feeder pipes, OPG shut down Unit 4 to perform additional feeder pipe inspections. OPG added that a revised and broader inspection program was now being carried out. Preliminary results indicated that 4 of 117 feeder pipes inspected in Unit 1, and 2 of 140 feeders inspected in Unit 4, should be replaced.

Dr. Greening, in his intervention, expressed doubt that OPG can carry out full circumferential inspections of the feeder pipes and questioned the integrity of the inspection procedures.

In response to the Commission's questions regarding Dr. Greening's intervention, OPG stated that it uses a conservative approach to its analysis by assuming that any material loss is based on flow-assisted corrosion. In response to the Commission's questions on why it had taken two years for OPG to perform ultrasonic inspections, OPG explained that this was the time necessary to plan and schedule the removal of feeder pipes. With the removal of the four feeder pipes in

Unit 1, OPG stated it now has the ability to obtain very good information on the condition of the pipe surfaces downstream of the elbows and can confirm that the pipes have not substantially thinned in those locations. OPG stated that this finding supports the expectation that thinning will occur primarily in the feeder pipe elbows where the turbulence in the flow is greatest.

CNSC staff expressed its satisfaction with the feeder pipe inspections currently being done and felt that all questions and issues were being addressed adequately. As stated earlier, OPG confirmed it would provide the next inspection results to CNSC staff, as well as to Dr. Greening for information.

#### Heat Exchangers:

OPG reported that it has implemented the Integrated Improvement Plan program for heat exchangers at Pickering NGS-A. OPG also noted that it has identified the heat exchanger inspection requirements for the next planned maintenance outage at Unit 4 and that it will complete similar inspections at Unit 1 prior to its planned return to service.

#### Valves:

OPG noted it has a specific valve program to inspect the condition of relief valves, check valves, motor and air-operated valves, manual valves and valve packing. The program is based on three phases: improvement program development, field program implementation, and component-based monitoring program.

### 3.7.3 Reliability of Safety Related Systems

As part of general fitness for service, it is important that key safety related systems not be unavailable for significant periods of time during operation. In this regard, OPG noted that there were no unavailability events involving the shutdown systems during the licensing period; however, there were three events involving the emergency coolant injection system which resulted in the unavailability of standby safety support systems. OPG reported that all special safety systems met predicted future, actual past and operational past unavailability targets.

OPG further stated that, through COG, it was working with CNSC staff on the proposed incorporation of the CNSC Regulatory Standard S-98, *Reliability Programs for Nuclear Power Plants* into the power reactor operating licence. As a result, OPG noted it is updating the Pickering NGS-A Risk Assessment for the inclusion of additional risk-significant systems using probabilistic risk assessment methods and deterministic means.

CNSC staff reported that, despite the short unavailability of some systems as noted by OPG, all systems met the annual reliability targets, including the containment and emergency coolant injection systems that were modified to improve their reliability.

CNSC staff noted that it was reviewing OPG's responses to issues regarding assumptions and apparent model weaknesses in the Shutdown System A reliability modelling results. CNSC staff was also reviewing OPG's reliability reporting at the time of this hearing.

Based on this information the Commission is satisfied that OPG is making, and will continue to make, adequate provisions to maintain the reliability of the special safety systems at Pickering NGS-A.

#### 3.7.4 Conclusions on Fitness for Service

Based on the above information, considerations and reasons, the Commission concludes that Pickering NGS-A is fit for service. The Commission notes that fitness for service will be continually reassessed at each maintenance outage. In this regard, the Commission is satisfied with OPG's programs for the inspection and life-cycle management of safety-critical systems.

### 3.8 Emergency Preparedness

The CNSC requires that licensees, as part of their provisions for protection of persons in the conduct of their operations, be prepared to deal effectively with emergencies that may arise. In this regard, OPG reported that it has revised and is implementing its Consolidated Nuclear Emergency Plan. The comprehensive plan includes regular testing and drills, as well as regular updates. Both CNSC staff and OSART noted OPG's strength in this area. OPG also reported on a Memorandum of Understanding that exists with the City of Pickering. Under that Memorandum of Understanding, OPG provides specialized training for fire services staff and the coordination of the respective Emergency Response Plans is assured.

CNSC staff reported that it finds emergency preparedness at Pickering NGS-A (both the program and its implementation) to exceed CNSC expectations.

The Citizens for Renewable Energy, in its intervention, questioned the high rating given by CNSC staff to the Pickering NGS-A program and implementation since weaknesses had been identified in some areas. In response to the intervenor's concern and related questioning from the Commission, CNSC staff confirmed the rating and explained that it was based on CNSC staff's review of the program for Pickering NGS-A and inspections and monitoring of the drills that OPG carries out. CNSC further noted that OPG is required by regulations to have in place arrangements on site for both responding to and mitigating the consequences of potential incidents. CNSC staff considers that OPG met and exceeded those requirements during the licence period.

In follow-up questioning on this topic, the Commission sought the views of Emergency Management Ontario. Mr. McKerrell of Emergency Management Ontario (EMO) described the siren system for the 0-3 kms contiguous zone and indoor alerting devices that the Municipality has purchased to meet the standard set out in the provincial nuclear emergency response plan. The installation of the system is pending the results of another study, initiated at the request of the City of Pickering. Mr. McKerrell noted that although a recommendation for a reduced number of sirens is expected following the study, Mr. McKerrell assured the Commission that EMO and an international expert would be reviewing the report to ensure compliance with appropriate standards. The municipality is responsible for the final implementation of the system.

Based on this information, the Commission concludes that emergency preparedness at Pickering NGS-A is adequate for the proposed licence renewal.

### **3.9 Security**

CNSC staff reported that the security program at Pickering NGS-A and its implementation meet CNSC expectations, including compliance with the *Nuclear Security Regulations* and Commission Order 01-1.

Citizens for Renewable Energy, in its intervention, expressed concern about the adequacy of the security requirements.

Crossby-Dewar Projects Inc. attested to the security of the perimeter boundaries and to the monitoring of persons entering the site.

The Ironworkers Local 721, in its intervention, endorsed the OPG Security Clearance Procedure.

While it would not be appropriate for the Commission to discuss security matters in detail in a public document, such as this *Record of Proceedings*, the Commission is satisfied that OPG's performance with respect to maintaining security at the facility has been acceptable. The Commission concludes that OPG has made, and will continue to make, adequate provisions for ensuring the physical security of Pickering NGS-A.

### **3.10 Non-Proliferation and Safeguards**

CNSC staff reported that OPG's program for the safeguarding of material and non-proliferation meets expectations. CNSC staff stated the OPG has cooperated with IAEA inspection activities and that certain nuclear materials accounting issues that had been raised earlier were now resolved.

OPG added that it performs annual self-assessments for adherence to the requirements and listed specific achievements in this area.

Based on this 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 Pickering NGS-A that are necessary for maintaining national security and measures necessary for implementing international agreements to which Canada has agreed.

### **3.11 Decommissioning and Financial Guarantees**

In order to ensure that adequate resources will be available to meet the same regulatory requirements for safety, environmental protection and security during the future decommissioning of Pickering NGS-A, the Commission requires that adequate plans and



financial guarantees for decommissioning and long-term management of waste be put in place and maintained acceptable to the CNSC.

In this regard, CNSC staff stated that the financial guarantee for decommissioning approved by the Commission, as documented in the *Record of Proceedings, Including Reasons for Decision* from the Commission hearing dated May 14, 2003, remains in effect. CNSC staff reviewed the annual reports for 2003 and 2004 and found no concerns.

The Commission concludes that the decommissioning financial guarantee for Pickering NGS-A remains acceptable for the purpose of the proposed licence renewal.

### **3.12 Nuclear Liability Insurance**

In its intervention, Citizens for Renewable Energy questioned the level of the coverage provided by the nuclear liability insurance based on the fact that the Nuclear Liability Act (NLA) came into effect almost 30 years ago.

CNSC staff reported that the insurance coverage of \$75 million meets the requirements of the NLA and that the insurance coverage provided by the Nuclear Insurance Organization of Canada and their two co-insurers has been confirmed for the current policy term.

The Commission notes that it has limited responsibilities under the NLA and that the Government of Canada is responsible for the policy framework on which it is based. The Commission is aware, however, that a review of the NLA is in process.

### **3.13 Canadian Environmental Assessment Act**

Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act* (CEAA) have been fulfilled. In this case, no environmental assessment is required under the CEAA as the issuance of the licence to continue operations at Pickering NGS-A is not a trigger for such an assessment under the CEAA.

The Commission accepts this interpretation of the CEAA and therefore concludes that no further environmental assessment of the proposed operation of the Pickering NGS-A, pursuant to the CEAA, is required before the Commission may consider and make a decision on this licence application under the NSCA.

### **3.14 Public Information Program**

CNSC staff noted that it continues to be satisfied that OPG's public information program at Pickering NGS-A meets the applicable regulatory requirements and is consistent with the CNSC Regulatory Guide G-217, *Licensee Public Information Programs*.

OPG outlined the various aspects of its public information program, including presentations, meetings, performance report cards, newsletters, education programs, and a *Community Advisory Council* with community representation. OPG also provided a number of planned improvements to the program.

OPG also reported on a local resident survey, performed as a follow-up to the environmental assessment, which showed that the return to service of Unit 4 had no negative impact on public attitudes and behaviours. In response to the Commission's questions on this, OPG indicated its plan to continue surveying the surrounding population on an on-going basis.

The Pickering Nuclear Generating Station *Community Advisory Council* (CAC), in its intervention, reported on its activities and interactions with OPG, stating the CAC process is working very well and that the issues raised as part of the process were being addressed by OPG.

The MP for Whitby-Oshawa (Ms. Judi Longfield), the Durham Chapter of Women in Nuclear and the Pickering Naturalists, in their interventions, attested to the openness of OPG's communication and information program.

Several intervenors including municipalities, community organizations, educational institutions and other community services attested to OPG's involvement in and commitment to the community.

Based on this information, the Commission is satisfied that the information program operated by OPG meets the regulatory requirements and is effective in keeping the public in the vicinity informed of the effects of the facility operations.

### **3.15 Licence Length and Interim Reporting**

OPG has applied to the CNSC for a five-year renewal of its licence. With reference to the CNSC staff criteria for recommending licence duration (as described in CMD 02-M12), CNSC staff recommended that the Commission accept and grant the proposed five-year term.

Two intervenors opposed the five-year licence based on the proposed plan of the Greater Toronto Airport Authority (GTAA) to build an airport in the vicinity of the Pickering NGS facilities. Mr. Degen, in his intervention, suggested that a maximum two-year licence be issued to allow for the completion of the GTAA's environmental assessment. Mr. Degen also quoted the IAEA Safety Standard NS-G-3 with regard to safety issues and aircraft crashes and urged the CNSC and OPG to intervene in GTAA's plan. In a similar intervention, Mr. Cochrane suggested a one-year licence and also urged that the IAEA standard be enforced.

The Commission sought further information on the proposed GTAA plan and where CNSC staff and OPG stood on the issue. OPG and CNSC staff both stated their awareness of the GTAA plan and will follow future developments closely. They also conveyed their awareness and understanding of the IAEA standard.

OPG expressed the view that the risk posed by aircraft remains within the framework that was used for the design basis of the plant. Nevertheless OPG stated its commitment to continue to monitor and re-evaluate the situation as necessary. OPG indicated that it will be actively participating in the GTAA environmental review process as appropriate.

The Commission notes that, while it maintains an interest in relevant airport planning processes, this matter currently falls outside the scope of this facility licensing hearing. The Commission expects to be kept informed about future significant developments as they arise and asks CNSC staff to monitor the GTAA processes for relevancy to Pickering Nuclear Generating Stations.

Citizens for Renewable Energy and Greenpeace, in their interventions, opposed a five-year licence on the basis of safety issues related to the age and the past performance of the facility (the intervenors' specific safety issues are noted in relevant sections of this *Record of Proceedings* and in their submissions). Both intervenors suggest a two-year licence.

Greenpeace suggested that a two-year licence would also allow for greater transparency and application of the precautionary principle in the regulatory process in general and specifically to Pickering NGS-A with regard to possible restart of Units 2 and 3 during the licence period. Greenpeace added that the absence of a complete second fast shutdown system for Pickering NGS-A, which is located in close proximity to urban areas, further justifies, in its view, the need for a shorter licence period.

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

Based on the above information and considerations, the Commission accepts the proposed five-year licence term. With respect to interim reporting, the Commission requests that CNSC staff present to the Commission at the approximate midpoint in the licence term, a report on performance at Pickering NGS-A. The report will be presented at a public proceeding of the Commission and could be part of the CNSC Staff Annual Report on the Canadian Nuclear Power Industry for the year 2006 or 2007. The Commission also acknowledges CNSC staff's commitment to provide performance information to the Commission on an annual basis as part of CNSC staff's Annual Report on the Power Industry.

The Commission further notes that should a significant event or safety concern arise at Pickering NGS-A in the interim, CNSC staff will report this to the Commission at a public meeting in the form of a Significant Development Report. CNSC staff and the Commission are able to take regulatory actions at any time to address an immediate safety concern.

#### **4. Conclusion**

The Commission has considered the information and submissions of the applicant and CNSC staff as presented in the material available for reference on the record, as well as the oral and written submissions of intervenors provided at the hearing.

The Commission concludes that OPG is qualified to carry out the activities that will be permitted under the renewed licence. Furthermore, the Commission concludes that in carrying out those activities, OPG 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.

The Commission therefore issues, pursuant to section 24 of the *Nuclear Safety and Control Act*, Nuclear Power Reactor Operating Licence PROL 04.00/2010 to Ontario Power Generation Inc. The licence is valid from July 1, 2005 to June 30, 2010, unless suspended, amended, revoked or replaced.

The Commission includes in the licence the conditions recommended by CNSC staff in the draft licence attached to CMD 05-H7 and in CMD 05-H7.B.

With this decision, the Commission requests that CNSC staff provide the Commission with a report on the performance of the facility at the approximate mid-point in the term of the licence. The mid-term performance report will be presented at a public proceeding of the Commission. Furthermore, the Commission requests CNSC staff to present a report to the Commission on the results of a follow-up International Atomic Energy Agency's (IAEA) Operational Safety Review Team (OSART) inspection of the Pickering NGS-A currently scheduled to occur in September 2005.

Marc A. Leblanc  
Secretary,  
Canadian Nuclear Safety Commission

Date of decision: May 20, 2005

Date of release of Reasons for Decision: June 28, 2005

## Appendix A - Intervenor

<b>Intervenor</b>	<b>Document Number</b>
J. Degen	CMD 05-H7.2
Society of Energy Professionals, represented by O. Heilandt	CMD 05-H7.3
Power Workers' Union, represented by P. Falconer	CMD 05-H7.4
Canadian Nuclear Workers' Council, represented by D. Shier and J-A. Usher	CMD 05-H7.5
Nuclear Generating Station Community Advisory Council, represented by J. Vincett, R. Ashby, J. Earley and Y. Mrouef	CMD 05-H7.6
J. Longfield, M.P., Whitby-Ottawa	CMD 05-H7.7
Women in Nuclear Durham	CMD 05-H7.8
M. Holland, M.P., Ajax-Pickering	CMD 05-H7.9
PineRidge Arts Council	CMD 05-H7.10
International Union of Painters and Allied Trades, District Council 46	CMD 05-H7.11
J. Flaherty, M.P.P., Whitby-Ajax	CMD 05-H7.12
Black & McDonald Limited	CMD 05-H7.13
Comstock Canada Ltd.	CMD 05-H7.14
Pickering Naturalists	CMD 05-H7.15
Sheet Metal Workers' & Roofers' Local Union No.30	CMD 05-H7.16
City of Pickering	CMD 05-H7.17
Ironworkers Local 721	CMD 05-H7.18
Teamsters Local Union No.230	CMD 05-H7.19
Big Brothers & Sisters of Ajax-Pickering	CMD 05-H7.20
Crossby-Dewar Projects Inc.	CMD 05-H7.21
Rouge Valley Health System	CMD 05-H7.22
Women in Nuclear Canada	CMD 05-H7.23
United Way of Ajax-Pickering-Uxbridge	CMD 05-H7.24
B. Cochrane	CMD 05-H7.25
Ajax-Pickering Toastmasters Club # 5425	CMD 05-H7.26
Hon. D. McTeague, P.C., M.P., Pickering-Scarborough-East	CMD 05-H7.27
Toronto and Region Conservation for the living City	CMD 05-H7.28
Vipond Fire Protection	CMD 05-H7.29
Canadian Blood Services	CMD 05-H7.30
Pickering Public Library	CMD 05-H7.31
WindReach Farm	CMD 05-H7.32
Pickering Soccer Club Inc.	CMD 05-H7.33
A. Sos	CMD 05-H7.34
M. Chan	CMD 05-H7.35
D. Singh	CMD 05-H7.36
T. Young	CMD 05-H7.37
X. Zhang	CMD 05-H7.38
Kinetrics Inc., represented by R. Fleck	CMD 05-H7.39

Babcock & Wilcox Canada Ltd.	CMD 05-H7.40
International Association of Machinists and Aerospace Workers	CMD 05-H7.41
Durham Nuclear Health Committee	CMD 05-H7.42
Durham District School Board	CMD 05-H7.43
A. Daley	CMD 05-H7.44
U. Hamdani	CMD 05-H7.45
Safe Communities of Pickering/Ajax	CMD 05-H7.46
Durham Region Manufacturers Association	CMD 05-H7.47
Frenchman's Bay Watershed Rehabilitation Project	CMD 05-H7.48
IBEW Local 894	CMD 05-H7.49
Town of Ajax	CMD 05-H7.50
T.A. Price	CMD 05-H7.51
Durham West Girls Hockey Association Inc.	CMD 05-H7.52
University of Ontario Institute of Technology and Durham College	CMD 05-H7.53
Friends of the Ajax Public Library	CMD 05-H7.54
Whitby Chamber of Commerce	CMD 05-H7.55
Ajax High School	CMD 05-H7.56
A. Ali	CMD 05-H7.57
Ajax-Pickering Board of Trade	CMD 05-H7.58
Durham Catholic District School Board	CMD 05-H7.59
Siemens Canada Limited	CMD 05-H7.60
Regional Municipality of Durham	CMD 05-H7.61
Pickering Hockey Association	CMD 05-H7.62
J. Clarke Richardson Collegiate	CMD 05-H7.63
Citizens for Renewable Energy, represented by Z. Kleinau	CMD 05-H7.64
D. Terry	CMD 05-H7.65
Greenpeace Canada, represented by D. Martin	CMD 05-H7.66
Pickering Community Concert Band	CMD 05-H7.68
Durham Radio Inc.	CMD 05-H7.69
W. Arthurs, M.P.P., Pickering-Ajax-Uxbridge	CMD 05-H7.70
Herizon House	CMD 05-H7.71
Veridian Corporation	CMD 05-H7.72
F.R. Greening	CMD 05-H7.73 CMD 05-H7.73A