



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Record of Proceedings, Including Reasons for Decision

In the Matter of

OPG Ontario Power Generation

Subject Application for the Renewal of the Licence for
the Darlington Waste Management Facility

Public Hearing
Dates December 3, 4, 5 and 6, 2012

Canada

RECORD OF PROCEEDINGS

OPG: Ontario Power Generation

Address/Location: 700 University Avenue, Toronto, Ontario M5G 1X6

Purpose: Application for the Renewal of the Licence for the Darlington Waste Management Facility

Application received: January 31, 2012

Dates of public hearing: December 3, 4, 5 and 6, 2012

Location: Hope Fellowship Church, 1685 Bloor Street, Courtice, Ontario

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Intervenors
See appendix A

Licence: Renewed

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INTRODUCTION

1. Ontario Power Generation (OPG) has applied to the Canadian Nuclear Safety Commission¹ for the renewal of the Waste Management Operating Licence for its Darlington Waste Management Facility (DWMF) located in Darlington, Ontario. DWMF provides for safe interim storage of cooled used fuel discharged from the reactors at the Darlington Nuclear Generating Station (Darlington NGS), and is an integral part of the Darlington NGS operations. Used fuel is initially stored underwater in the bays for irradiated fuel for a minimum of 10 years. After that time, the residual radiation and decay heat are sufficiently low to allow this fuel to be moved to dry storage containers for further storage.
2. The facility received its first operating licence in November 2007, and began operating in 2008. It is located within the controlled area of the Darlington NGS site and consists of a dry storage container (DSC) processing building, and DSC Storage Building #1. The current operating licence, WFOL-W4-355.00/2013, expires on April 30, 2013. OPG has applied for the renewal of this licence for a period of ten years.
3. In its application, OPG has also requested the Commission's approval for the construction and operation of two additional waste management buildings. The environmental assessment (EA) related to this expansion of the facility has been presented to the Commission in the context of the EA Screening Report for the refurbishment of the Darlington NGS that is being considered simultaneously with the requested DWMF licence renewal, and would be subject to a separate decision. The expansion of this facility would accommodate retube waste from the reactors and used fuel from continued, post-refurbishment operation.
4. This *Record of Proceedings, Including Reasons for Decision* deals specifically with the application for the renewal with changes of the Waste Management Operating Licence for the DWMF. The *Record of Proceedings, Including Reasons for Decision* for a licence renewal for the Power Reactor Operating Licence (PROL) for OPG's Darlington NGS was released earlier on February 26, 2013. The *Record of Proceedings, Including Reasons for Decision* addressing the EA for OPG's proposed refurbishment of the Darlington NGS, which includes the proposed expansion of the DWMF, has been released simultaneously.

Issue

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

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

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

- 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

6. The Commission, in making its decision, considered information presented at a public hearing held on December 3, 4, 5 and 6, 2012 in Courtice, Ontario. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*³. During the public hearing, the Commission heard evidence and considered the three applications filed by OPG for the renewal of the PROL for its Darlington NGS, for the renewal of the Waste Facility Operating Licence for its Darlington Waste Management Facility and for the environmental assessment for the proposed refurbishment of the Darlington NGS. The Commission received written submissions and heard oral presentations from CNSC staff and OPG, as well as oral and written submissions from 690 intervenors (see Appendix A for a detailed list of interventions), on all three matters. Written submissions from CNSC staff (CMD 12-H14) and OPG (CMD 12-H14.1 and CMD 12-H13.1A) specifically addressed the Darlington Waste Management Facility licence renewal. Information that was also considered during this hearing pertaining to OPG's application for a licence renewal for its Darlington Nuclear Generating Station and the environmental assessment for OPG's proposed refurbishment of the Darlington NGS is dealt with in separate records of proceedings.
7. Several intervenors raised questions on the future on nuclear energy in Ontario. In particular, they asked why more consideration was not given to alternatives forms of energy, such as solar or wind power. Others, such as the Canadian Coalition for Nuclear Responsibility, CCNB Action and United Church of Canada, have asked the CNSC to recommend a national public inquiry on the use of nuclear power. The Commission notes that, as the Canadian Regulator of the nuclear sector, its mandate is not to evaluate alternative energy sources or make energy policy decisions, but to ensure, in accordance with the NSCA, the regulation of the development, production and use of nuclear energy to prevent unreasonable risk to the environment and to the health and safety of persons. The choice of a source of energy or the consideration of economical benefits of a project is not within the Commission's authority to adjudicate. These decisions fall under the purview of other government authorities.
8. One member of the public requested before the hearing that Commission Member Rumina Velshi recuse herself from the hearing on the basis of her previous association with OPG. During the hearing, the Toledo Coalition for Safe Energy also made such a request. Member Velshi duly considered this request and decided not to recuse herself from these hearings based on the fact that more than three years had passed since her retirement from OPG and that her activities after the retirement have demonstrated a

³ Statutory Orders and Regulations (SOR)/2000-211.

clear change in professional focus. Member Velshi is satisfied that she has no conflict of interest and that she approached this matter with a fair, impartial and open mind.

Mandate of the Commission

9. The Commission states that it has the independence necessary to fulfill its mandate and that the process in place to obtain the information necessary for making informed decisions is open and transparent. The Commission, as a quasi-judicial administrative tribunal, considers itself independent of all political, governmental or private sector influence in its decision-making.

DECISION

10. 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's Waste Management Operating Licence for its Darlington Waste Management Facility located in Darlington, Ontario. The renewed licence, WFOL-W4-355.00/2023, is valid from March 13, 2013 to April 30, 2023.

11. The Commission includes in the licence the conditions as recommended by CNSC staff and set out in the draft licence attached to CMD 12-H14. With this decision, the Commission also authorizes the construction and operation of two additional storage buildings.
12. The Commission also accepts CNSC staff's recommendation regarding the delegation of authority in the Licence Conditions Handbook (LCH). The Commission notes that CNSC staff can bring any matter to the Commission as applicable. The Commission directs CNSC staff to inform the Commission on an annual basis of any changes made to the LCH.
13. As reflected in the Minutes of the Canadian Nuclear Safety Commission Meeting⁴ held on December 8 and 9, 2010, the Commission expects that CNSC staff will provide its next consolidated report on the performance of the waste management facilities in 2014, insofar as CNSC staff does not include waste management facilities in the

⁴ CMD 10 – M74

Nuclear Cycle and Facilities Regulation Annual Report. CNSC staff shall present this report at a public proceeding of the Commission.

ISSUES AND COMMISSION FINDINGS

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

Application of the Canadian Environmental Assessment Act

15. Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act, 2012*⁵ (CEAA 2012) have been fulfilled.
16. CNSC staff informed the Commission that, although the CEA Act (S.C. 1992, c. 37) was repealed when the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) came into force on July 6, 2012, the Minister of the Environment has designated that the EA for the Darlington NGS Refurbishment and Continued Operation Project will continue and be completed under its current EA process – the CEA Act. A licence renewal with changes was interpreted as an amendment to a licence. Amendments are included in the *Law List Regulations*⁶, with respect to subsection 24(2) of the NSCA, therefore there was a “trigger” pursuant to subsection 5(1) of the CEA Act. As the requested site preparation, construction, modification and operation of the two additional buildings are undertakings that include physical work, there was a “project” pursuant to section 2 of the CEA Act. As the *Exclusion List Regulations*⁷ did not apply, CNSC staff determined that an EA was required for the construction and operation of two additional storage buildings.
17. CNSC staff further informed the Commission that the requested licence renewal for DWMF formed part of OPG's project description for the Darlington NGS Refurbishment and Continued Operation Project, and that the two requested waste storage buildings are a necessary component of this project. Therefore, this undertaking, with other undertakings, had been included in the scope of the project for EA purposes under the CEA Act. The scope of the project, as part of the Scoping Information Document for the Darlington NGS Refurbishment and Continued Operation Project, was approved by the Commission in October 2011. As such, the undertakings associated with this request for licence renewal had been assessed in the screening-level EA for the Darlington NGS Refurbishment and Continued Operation Project, and were considered by the Commission simultaneously with this request,

⁵ S.C. 2012, c. 19, s.52

⁶ S.O.R./94-636

⁷ S.O.R./2007-108

during the same public hearing. The decision rendered by the Commission regarding the EA will be presented in a separate Record of Proceedings.

18. CNSC staff stated that an approval to construct additional buildings at DWMF will not be considered by the Commission or a person designated by the Commission until the EA is completed and approved.
19. Based upon the above assessment, the Commission is satisfied that an environmental assessment for the construction and operation of additional storage buildings was included in the EA completed for the Darlington NGS Refurbishment and Continued Operation Project, and that a separate environmental assessment under the CEAA is not required for OPG's application for DWMF licence renewal.

Management System

20. The Commission examined OPG's Management System which covers the framework that establishes the processes and programs required to ensure the organization achieves its safety objectives, continuously monitors its performance against these objectives, and fosters a healthy safety culture. CNSC staff evaluated OPG's management system and rated it as satisfactory.

Quality Management

21. OPG informed the Commission that the NWMD Management System is governed by program document *Nuclear Waste Management Program* which defines the organizational responsibilities, interfaces, and applicable program elements for the management of nuclear waste. This system is established in accordance with OPG's Nuclear Management System, which fulfills the requirements of Canadian Standards Association (CSA) Standard CSA N285.0/N285.6: *General Requirements for Pressure-retaining Systems and Components in CANDU Nuclear Power Plants/ Material Standards for Reactor Components for CANDU Power Plants*, CSA Standard CSA N286-05: *Management system requirements for Nuclear Power Plants* and International Organization for Standardization (ISO) 14000 series of standards.
22. OPG representatives added that the assessment of the Nuclear Waste Management Program implementation relies on a multi-tiered system of independent audits and self-assessments activities. They said that internal and external audits are conducted annually by an independent third party auditor and that a comprehensive internal Used Fuel Operations Audit was completed at all three waste management facilities in 2010 and in July 2012. Over the operating lifetime of DWMF, these audits have produced only one finding which was promptly addressed, confirming thus that DWMF is meeting objectives and requirements in all areas.
23. CNSC staff informed the Commission that an operational quality management

program, relevant to the DWMF activity, requires the series of processes necessary for the safe operation of the facility to be integrated and documented in manuals, policies and procedures. CNSC staff reported that OPG *Waste Management Program* describes the organizational responsibilities, interfaces and key program elements for the management of spent nuclear fuel. The document incorporates the controls necessary to meet the requirements of the CSA Standard N286-05: *Management System Requirements for Nuclear Power Plants*.

24. CNSC staff further reported that OPG performs both internal and external audits, and confirmed that an audit conducted in 2009 by external, independent auditors had resulted in OPG being recertified as being ISO 14001 compliant, which represents the requirement for a management system focused on environmental protection.
25. CNSC staff informed the Commission that they intend to conduct a focused Type II inspection during the next licence period, should the licence be renewed. This type of inspections includes all verification activities related to routine (item by item) checks and rounds. These inspections may be planned or reactive, announced or unannounced, and are conducted by one CNSC inspector or a team. They verify the results of licensee processes and include routine inspections or rounds to check equipment, systems, records and products

Organization

26. Organizational change management ensures that organizational changes are evaluated, managed and communicated, both internally and externally, to ensure that the changes do not adversely impact safe operation of the facility.
27. OPG informed the Commission about the organization of OPG's Nuclear Waste Management Division (NWMD), which is responsible for the safe and reliable operation of OPG's three waste management facilities, including the DWMF. OPG representatives explained the transition to a centre-led matrix organization structure, initiated by OPG in May 2012, that will allow for consistent functional practices to be leveraged across the organization, and noted that staff supporting the continued and safe operation of DWMF would remain the same.
28. OPG representatives further informed the Commission that NWMD continues with adoption of OPG Nuclear governance using a phased approach. The process would be completed early in 2013, and would result in consolidation of all existing NWMD program documents into two of them.
29. CNSC staff reported that OPG had undergone an organizational change affecting the NWMD in 2008, and that, as a result, the NWMD has adopted OPG's corporate Management System and their framework of governing documents. CNSC staff has reviewed the OPG charter document N-CHAR-AS-0002: *Nuclear Management System*, and found that it to meets their regulatory expectations.

Conclusion on Management System

30. 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 DWMF indicates OPG's ability to adequately carry out the activities under the proposed licence.

Human Performance Management

31. Human performance management encompasses activities that enable effective human performance through the development and implementation of processes that ensure the licensee's staff have the necessary knowledge, skills, procedures and tools in place to safely carry out their duties. After evaluating this safety and control area (SCA), CNSC staff rated it as satisfactory.
32. OPG informed the Commission that NWMD had adopted the standards of the Nuclear Human Performance Program in 2010, and that an implementation plan had been put in place to cover event free day resets, procedural use and adherence, observation and coaching, and pre-job briefs and post-job debriefs.

Training

33. OPG informed the Commission that their training plan had been developed for each occupation using a Systematic Approach to Training (SAT), and that the plan identifies the training needed to meet the skill and knowledge requirements of a specific position. The training and qualifications of the staff include initial training, on-the-job training, and evaluation. The training is then maintained by specialized training, periodic re-qualification and refresher training. The training status of each employee is maintained in a Training Information Management System.
34. CNSC staff stated that OPG has well established training programs which have been accepted by CNSC staff and meet their regulatory expectations. OPG's training system is based on SAT, and covers qualification training, hands-on and refresher training. CNSC staff reported that OPG's well documented personnel training system is verified through CNSC's compliance inspections and reviews of OPG training records for staff and contractors.

Human Factors

35. OPG informed the Commission that NWMD had developed a site strategic plan to provide and record recently completed and currently in-progress initiatives and

business plans to address site and division wide human performance vulnerabilities. OPG representatives said that human performance program at NWMD is defined by the document *Human Performance*. Since the program implementation, DWMF had only one event free day reset due to the late submission of the DWMF 2011 third quarter Operational Programme Update on Safeguards to the CNSC and International Atomic Energy Agency (IAEA). As a result, DWMF staff involved with regulatory reporting have been coached on the importance of meeting reporting requirements on a timely basis, and DWMF management initiated a weekly review of all upcoming reporting requirements.

36. OPG representatives added that an independent auditor reviewed the effectiveness of the program in 2011, and that, as a result of the findings, OPG had formed two teams: one of them was a human performance working team responsible for monitoring, implementing and developing future plans for the Human Performance Program, and the second was a Human Performance Oversight Committee responsible for providing direction and oversight of the program.
37. CNSC staff informed the Commission that OPG's human performance program at the DWMF includes human factors that influence human performance such as procedures development and compliance, pre- and post-job briefings, and safe work strategies and practices. CNSC staff conducted routine Type II compliance inspections to verify procedure use and adherence and participated in pre-job briefings. CNSC staff further informed the Commission that OPG had promptly reported and addressed all identified deficiencies or human performance errors.
38. The Commission sought more information regarding ISO 14001 audits planned for 2012 and the results of the audits. OPG representatives responded that they had been audited by an external third-party auditor and successfully re-accredited.

Conclusion on Human Performance Management

39. Based on its consideration of the presented information, the Commission concludes that OPG has appropriate programs in place and that current efforts related to human performance management provide a positive indication of OPG's ability to adequately carry out the activities under the proposed licence.

Operating Performance

40. Operating performance includes operating policies, reporting and trending, and application of operating experience that enable the licensee's effective performance, as well as improvement plans and significant future activities. CNSC staff assessed the conduct of the licensed activities and the activities that enable effective performance at the DWMF, and rated this SCA as fully satisfactory.

Conduct of Operations

41. OPG informed the Commission that the DWMF operates using procedures that ensure compliance with their Operating Policies and Principles, the Operating Licence as issued by the CNSC and the OPG governing documents, and stated that they submit quarterly reports regarding the DWMF performance to CNSC staff.
42. OPG has committed to full implementation of the corporate nuclear program that incorporates all of the existing program requirements by the end of February 2013. This implementation would include a transition from the current Conduct of Operations and Maintenance to the developed Nuclear Waste Management Program.
43. CNSC staff reported that, after the commissioning report and authorization of the operation, DWMF had received its first dry storage container (DSC) in April 2008, and that by the end of 2011 it had received and processed 68 736 spent fuel bundles stored in 179 DSCs. CNSC staff added that the DWMF currently consists of one processing building and one DSC storage building, which has a capacity to store 500 DSCs.
44. CNSC staff added that they had conducted nine Type II inspections during the licence period and that there were no concerns identified during these inspections.
45. The Regional Municipality of Durham, in their intervention, while supporting licence renewals for the Darlington NGS and DWMF, noted that the key impact on the region of the refurbishment project would be the increased onsite storage of nuclear waste from the replacement of the reactor components and used fuel from 30 additional years of operation, and expressed concerns regarding the length of time that the waste would remain at the generating stations. The intervenor added that Durham Region was looking for assurance that the nuclear waste would be expeditiously removed from Durham sites when possible. The Commission asked how would a potential delay in realization of the long-term storage project, managed by the NWMO and expected to be completed in 2035, affect the municipality's support for continuous operation of the Darlington facility. The representative of the Regional Municipality of Durham reiterated their strong support for the refurbishment and extended operation of the facility, and encouraged the NWMO to continue in its efforts to reach a long-term solution for spent fuel and facilitate the removal of the stored material from Durham as expeditiously as possible.
46. K. Clune, in her intervention, complained about the continuous production of nuclear waste and expressed concerns regarding the lack of organization and transparency related to nuclear waste management and about radioactive waste locations left unknown without surveillance or control. The Commission asked OPG to explain their waste management practices. OPG representatives responded that every plant has plans for waste minimization and classification. Low and intermediate level wastes are transferred to OPG's interim waste management facility at the Western Waste Management Facility. OPG representatives added that, in the case of used fuel, they

have a proven track record of accounting for every fuel bundle ever generated from an OPG facility. These bundles are stored in safe, secure and robust containers at each of the facilities where they were generated. In this way, OPG has a complete inventory that is computer-based and is able to track all the waste that was generated.

47. The Commission asked CNSC staff about the regulatory framework which guides the nuclear waste storage facilities. CNSC staff responded that the CNSC applies the principle 'from cradle to grave' and that it regulates the nuclear energy from the mine all the way to the final destination of used radioactive material. CNSC staff confirmed that all waste facilities in Canada or any site containing nuclear waste is licensed by the CNSC. CNSC staff added that a complete list of all facilities that have a waste licence is posted on the CNSC's website.

Events, Reporting and Trending

48. OPG representatives stated that OPG reports any event that is potentially a reportable event to CNSC staff and that all commitments made to CNSC staff were tracked within the Regulatory Commitment Action Tracking System. OPG representatives reported that there were three reportable events in 2008 and one in 2011.
49. CNSC staff reported that their reviews of the quarterly reports submitted by OPG did not show any deficiencies. CNSC staff also provided the Commission with a consolidated status report on the operations at OPG's Darlington, Pickering and Western Waste Management Facilities in December 2010. The next consolidated status report will be presented to the Commission in 2014.
50. The Commission asked about attendance during the CNSC's compliance promotion meetings with OPG. CNSC staff responded that, as part of compliance inspections, CNSC staff conducts pre- and post-inspection meetings with participation of all who had participated in inspections. CNSC staff added that other agencies, such as Environment Canada and Ontario Ministry of Labour, are invited and participate at these meetings.

Operating Experience

51. OPG reported that their operating experience across OPG's three waste management facilities is reviewed on a weekly basis and that adverse conditions are documented in the OPG-Nuclear corrective action program. After an appropriate level of investigation, corrective action plans are created to prevent reoccurrence.
52. OPG also reported on their response to the Fukushima event and stated that NWMD had conducted a systematic review of the significant systems, structures and equipment to verify the capability to mitigate conditions resulting from potential external hazards such as seismic, flooding, fire and extreme weather events. OPG representatives noted

that there were no operating performance design improvements identified for the DWMF, as a result of the above review.

53. CNSC staff informed the Commission that an operating experience (OPEX) program records and disseminates operational experiences for the prevention of events, and requires that the licensee identify safety significant events, analyze them and develop Corrective Actions (CAs) to prevent recurrence. CNSC staff added that a well established OPEX program had been implemented and lessons learned had been communicated to all OPG waste management facilities and, if applicable, to other nuclear generating stations and to industry through CANDU Owners Group meetings.
54. The Commission sought clarification of OPG's statement from their submission, according to which OPG has accelerated the processing rate of transferring used fuel to the dry storage container in alignment with international strategy to address lessons learned from Fukushima event. OPG representatives responded that the current reference is that the fuel remains in the bay for a minimum of ten years; however, a study is currently underway to look at a shorter term. A design analysis is in preliminary phase, and OPG will consult with the CNSC once the analysis is available.

Conclusion on Operating Performance

55. Based on the above information, the Commission concludes that the operating performance at the facility satisfies regulatory requirements and provides a positive indication of OPG's ability to carry out the activities under the proposed licence.

Safety Analysis

56. The Commission examined issues related to the program areas of Safety Analysis in order to assess the adequacy of the safety margins provided by the design of the facility.
57. Safety analysis is a systematic evaluation of the potential hazards associated with the conduct of a proposed activity or facility and considers the effectiveness of preventive measures and strategies in reducing the effects of such hazards. It supports the overall safety case for the facility. CNSC staff has reviewed the performance of OPG in this safety and control area, and rated it as fully satisfactory.

Hazard Analysis

58. CNSC staff informed the Commission on their assessment of hazard analysis regarding DSC design improvements and OPG's application of non-destructive testing of the DSC lid closure weld quality. CNSC staff stated that, after gaining operational experience, OPG had modified the original DSC design to shorten processing time and

reduce the amount of welding required for each DSC, and to allow for non-destructive testing of the welds. The introduced DSC design changes have resulted in reduced radiological dose to personnel and in improvement to conventional safety during DSC processing operations.

59. CNSC staff reported that they had reviewed OPG's submissions and accepted the commissioning activity plan in accordance with conditions of the licence for the revised DSC design in November 2008. The full commissioning, including fuel loading, processing and storage had been successfully completed in 2009.
60. With respect to non-destructive testing, OPG introduced the phase array ultrasonic technology (PAUT) instead of radiography that has been traditionally used to inspect the DSC welds. OPG has been using PAUT for testing the integrity of nuclear generating stations (NGS) plant components since 1997. The implementation of PAUT allows for safer and more versatile inspections, and has several advantages over radiography. CNSC staff stated that OPG had developed inspection procedures, demonstrated that PAUT offers an equivalent level of detection of weld defects, and implemented a DSC weld-specific training program for the PAUT data analysis. The implementation of these personnel training and qualification requirements exceed the Canada-wide certification requirements for conventional ultrasonic technology inspectors.
61. CNSC staff further reported that they had assessed OPG's submissions, observed demonstrations of OPG's PAUT qualification work, reviewed the training program documentation, and accepted the use of PAUT to inspect DSC lid closure welds. OPG first implemented PAUT at the DWMF in 2010.
62. The Commission sought more information regarding efficiency of the PAUT and less stringent requirements for personal protection of operators. OPG representatives explained the procedure of identifying flaws in material by using this technique, and responded that it allows for faster, safer and more versatile inspections, with no requirements for personal radiological protection since there are no radiation sources usually associated with radiography.

Safe Operating Envelope

63. OPG informed the Commission that the DWMF safety analysis, presented in the DWMF Safety Report, provides an overview of the facility design and operations, and demonstrates that the facility can be operated safely without undue risk to the health and safety of workers, the public and the environment. In the updates to this report, safety issues and their resolutions are identified and prioritized, and proposed modifications to the facility design and operations are assessed for safety impact. Additional safety analyses and assessments are performed if new operating conditions are identified. The current version of the Safety Report was submitted to the CNSC in 2009 and approved in 2010. During the current licence period, two new assessments

were performed in addition to those presented in the initial issue of the report.

64. With respect to the Fukushima event, OPG representatives informed the Commission that they had reviewed the initial lessons learned and re-examined the safety case for the DWMF, in particular the underlying defence-in-depth concepts focussing on external hazards such as seismic, flooding, fire and extreme weather, and anticipated preventive and mitigation measures as well as emergency preparedness. As a result, improvements and enhancements were identified and emergency and preparedness instructions have been developed to improve the post-event worker response.
65. OPG representatives added that OPG intends to undertake a technical study to evaluate the consequence of a beyond design basis earthquake at the DWMF while a second technical study is planned to evaluate the feasibility of lowering the inventory of irradiated fuel in the fuel bays by moving the bundles to DSCs earlier than the current 10-year period.
66. CNSC staff informed the Commission that OPG updates their safety reports for the DWMF every three years. CNSC staff added that they had reviewed and accepted the updated safety reports for the DWMF in accordance with the operating licence conditions.
67. CNSC staff further informed the Commission that the implementation of the new OPG's corporate programs would include a transition from the current to the newly developed Conduct of Engineering Program.

Conclusion on Safety Analysis

68. On the basis of the information presented, the Commission concludes that the systematic evaluation of the potential hazards and the preparedness for reducing the effects of such hazards is adequate for the operation of the facility and the activities under the proposed licence.

Physical Design

69. Physical design relates to activities that impact on the ability of structures, systems and components to meet and maintain their design basis given new information arising over time, planned modifications to the facility, and taking changes in the external environment into account. The specific areas that comprise physical design at the site include the following:
 - System classification and engineering change control;
 - Pressure boundary design; and
 - Package certification.
70. CNSC staff reported that they had reviewed the performance of OPG with respect to

this safety and control area, and rated it as satisfactory.

System Classification and Engineering Change Control

71. OPG informed the Commission that their management of the design basis is addressed by the Conduct of Engineering Program that provides the framework for performing engineering work in a consistent manner across OPG's nuclear waste management facilities. OPG representatives added that their engineering change control process provides requirements to ensure that all modifications to structures, systems, equipment and components are correctly designed, reviewed, authorized and installed. The process also provides for all modifications to be commissioned and tested, reviewed and accepted by the appropriate NWMD stakeholders before the modified structure, system, equipment or component is placed into service.
72. OPG further informed the Commission about numerous modifications made during the current licence period. These modifications included an upgrade of DWMF fire detection system, modification of the DSC design and introduction of a second manufacturer, introduction of the phased array ultrasonic testing (PAUT) and various upgrades and improvements made to the DSC transporters. In addition, a Site Modification Report Card had been introduced to track the overall health of the Engineering Change Control process, which is also used to measure NWMD's performance and to ensure that corrective actions are being taken to address observed weaknesses or deficiencies.
73. CNSC staff confirmed that OPG continues to operate under a Conduct of Engineering Program that had been accepted by CNSC staff. This program includes an engineering change control process for design changes, which complies with Canadian Standard CSA N286-05: *Management System Requirements for Nuclear Power Plants*. CNSC staff added that the aforementioned DSC design changes and implementation of PAUT had been conducted in accordance with this program.
74. The Commission enquired if differences in configuration of different types of reactor fuel bundles, would initiate changes in the DSCs and in the ways they are handled and packed. OPG representatives responded that minor differences have no impact to operations, and that the Safety Assessment has demonstrated that such fuel bundles are within the existing safety envelope. CNSC staff concurred.

Pressure Boundary Design

75. OPG informed the Commission that their Pressure Boundary Program represents the basis for a process to manage repairs, replacements and modifications on pressure retaining systems and components, which meets the requirements of CSA Standard N285.0 – 08 and Update No. 1, and the DWMF Operating Licence. All pressure boundary requirements, including approval of any deviations from those requirements,

are under jurisdiction of the CNSC, and required authorizations are granted by the Technical Standards and Safety Authority (TSSA) on behalf of CNSC staff.

76. OPG noted that they had established a formal agreement with the TSSA in April 2010. This contract is for a period of three years and will ensure that the TSSA will be used to perform pressure boundary related activities, such as registration, repairs, replacements and modifications. OPG representatives added that TSSA and OPG Nuclear Oversight would be used to perform independent evaluations and assess NWMD's compliance with the new governance framework, which would be fully implemented by February 2013.
77. CNSC staff informed the Commission that, in 2009, they had assessed OPG's programs in relation to the new pressure boundary inspection requirements and found them to meet expectations. CNSC staff added that the DWMF licence had been amended by the Commission in 2010 to update licence conditions related to Pressure Boundary Program requirements, and to accommodate OPG's transition to the 2008 edition of Canadian Standards CSA N285.0: "*General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants*".
78. CNSC staff further informed the Commission that they were satisfied with improvements and implementation of the OPG's Pressure Boundary Program and that they would continue to review OPG's updates on the status of implementation through desk top reviews and compliance promotion meetings.
79. The Commission asked for the reason for existence of the pressure boundary program in DWMF. OPG representatives responded that there are some systems that do have pressure boundary requirements, such as in the fire protection area, and that although this standard is applicable to CANDU reactors and nuclear power plants, some of the elements of the standard do apply to these DWMF systems.

Package Certification

80. CNSC staff reported that the old design of DSCs, with impact limiters, remain a Type B CNSC certified transportation package in accordance with the *Packaging and Transport of Nuclear Substances Regulations*, and that OPG had demonstrated that the design changes for the modified DSCs had been conducted in accordance with their Conduct of Engineering Program.

Conclusion on Physical Design

81. On the basis of the information presented, the Commission concludes that the design of the DWMF is adequate for the operation period included in the proposed licence.

Fitness for Service

82. Fitness for service covers activities that are performed to ensure the systems, components and structures at DWMF continue to effectively fulfill their intended purpose. The activities include the following:
- Equipment fitness for service/equipment performance;
 - Maintenance;
 - Structural integrity; and
 - Ageing management.

CNSC staff reported that they had reviewed the activities of OPG included in this safety and control area, and rated the performance as satisfactory.

Equipment Fitness for Service and Equipment Performance

83. OPG informed the Commission that the equipment fitness for service is supported by corrective and preventative maintenance, and that all maintenance activities at DWMF are governed by NWMD's Conduct of Operations and Maintenance Program. OPG representatives added that equipment fitness for service is also supported by an Ageing Management Program, which consists of two components; the aging management of the loaded DSC's, and the equipment Aging Management Program that is part of the Conduct of Engineering Program.
84. OPG representatives stated that they had produced system health reports for the facility's critical systems, which summarize the status of key parameters and assess the overall condition of the systems based on the system performance monitoring. These reports have shown that the performance of the critical DWMF systems and associated equipment have met the functional requirements throughout the current licence period.
85. CNSC staff informed the Commission that OPG continues to assess the performance of critical system components on an annual basis and submit system health reports. These reports assist OPG in determining the need for improvements and in ensuring long term reliability.
86. In their intervention, Bruce Power presented their experience in managing nuclear waste, and handling and transporting DSCs. The Bruce Power representative noted that the technology was not new, but safe and proven through their over 16 years of day-to-day operation. The Commission asked if the same technology is used in DWMF. OPG representatives responded that the technology was the same.
87. The Commission enquired if any of the DSCs experienced a malfunction or failure of any kind. Both OPG and Bruce Power representatives responded that neither of them ever experienced problems and had no incidents involving DSCs.
88. The Commission further enquired about heat development and pressure increase within

DSCs during the storage. OPG representatives responded that a significant amount of heat had already dissipated during the cooling period of ten years and added that the DSCs had been designed taking into account residual heat and pressure.

Maintenance

89. OPG representatives informed the Commission that the major upgrades implemented to improve system health included a replacement of x-ray based non-destructive examination of DSC lid-to-base welds by the Phased Array Ultrasonic Testing process (PAUT), a replacement of the smoke beam detectors in the storage area with a linear heat detection system, and the installation of an after treatment device on the DSC transporter vehicle to provide cleaner exhaust emissions.
90. OPG representatives further informed the Commission about their preparations to introduce video inspections of the underside of the base plate of selected DSCs, and noted that selected DSCs would represent a baseline population to be periodically re-inspected to monitor their condition. OPG representatives added that a DSC containing corrosion monitoring sensors was fabricated and delivered to the DWMF, and will be used to assess the condition of the inner steel liner that is part of a dry storage container loaded with used fuel.
91. CNSC staff informed the Commission that, during the licence period, OPG had conducted routine and preventative maintenance activities at the DWMF, and that all planned maintenance activities were scheduled and tracked. CNSC staff conducted routine inspections and confirmed that equipment was maintained, tested and regularly inspected by OPG.
92. The Commission asked about the safety of DSCs currently used at Darlington site. OPG representatives responded that the dry storage containers have been used for over 16 years and that they are rigorously tested and processed during each phase from its original design through fabrication to licensing under oversight by the CNSC. The containers go through a rigorous process to secure the contents, they are leak tested, welded, secured, and are part of an ageing management program to validate their robustness. OPG representatives added that DSCs are designed for a minimum life span of 50 years, but are expected to last for at least 100 years with continued monitoring and through application of the ageing management plans.
93. The Commission enquired on the possibility of repacking the content of DSCs at the end of their life, or upon deterioration. OPG representatives responded that they have initiated a study with the intention to develop a process for safe removal and repacking of the DSC content if needed.
94. The Commission further enquired on testing of the DSCs and potential leakage of material or radiation. OPG representatives responded DSCs are prepared for use by thorough cleaning and drying prior to be transported to OPG's dry storage facility.

After filling with an inert gas to avoid corrosion and welding the lid to the base, DSCs are vacuum tested. OPG representatives added that, although these are not pressure vessels, this rigorous testing process is commensurate with the pressure boundary requirements. The testing and ongoing studies include corrosion, the welds, the exterior, as well as the interior, which was fully instrumented to start to investigate corrosion from the inside of the DSC. The study aims at verifying that a DSC would exceed a 100-year lifetime.

95. The Commission further enquired on the function of drain ports and safeguard tubes. OPG representatives explained that drain ports serve to evacuate water that comes with wet fuel elements when they are transferred into a DSC from the storage bay. These ports could also be used for additional interior testing or for refilling a DSC with helium. With respect to safeguard tubes, OPG representatives responded that, because of non-proliferation requirements, these containers are fully instrumented for review by the IAEA which keeps the facility under constant surveillance to assure the safeguard in the long-term care and control of these containers.
96. The Commission asked about the extent of concrete ageing and its impact to DSCs. OPG representatives responded that DSCs are constructed of 20 inches of concrete bounded by steel, covered with an epoxy high quality painting, and added that the DSCs are regularly monitored and inspected as part of OPG's aging management. One of the concerns is corrosion due to the presence of chlorides in air, so that OPG has chloride monitoring in the facilities. This monitoring has indicated that OPG's waste management facilities are safe.

Environmental Qualification

97. OPG representatives informed the Commission that no gaps were identified during walk-downs of the significant systems and structures performed to verify the capability at the DWMF to mitigate conditions that result beyond design basis events. These walk-downs had been performed in response to the Fukushima event.

Structural Integrity and Ageing Management

98. OPG representatives informed the Commission that the Aging Management Program is a subset of life or life-cycle management programs that involve the integration of ageing management and economic or business planning. The equipment can prematurely age due to degradation mechanisms in the operating environment such as heat, cold, radiation or moisture. OPG representatives noted that radiation levels are low at DWMF and do not contribute significantly to a degradation mechanism. Good equipment selection and adequate building design eliminate heat, cold and moisture as degradation mechanisms, so that the major aging management concern for equipment is obsolescence of parts, especially for electronics. As equipment begins to approach obsolescence, plans are made through the business planning cycle to replace the

equipment with new or updated equipment.

99. CNSC staff informed the Commission that OPG continues to assess the integrity of structures, components and equipment within the DWMF, and had implemented a biennial DSC base inspection program. CNSC staff added that aging management activities for the DSCs, performed by OPG, includes monitoring of the protective coatings on the lid-to-base structural welds, the vent seal weld and the drain seal weld.
100. CNSC staff reported that OPG had provided reports on DSC base plate inspections in February 2010 and February 2012. CNSC staff reviewed the information and concurred with OPG's conclusion that there was little or no change in the condition of the base plates between these inspections (3-6 years). CNSC staff also reported that they had observed DSC base plate inspection activities and procedure during routine compliance inspections at OPG's Pickering Waste Management Facility.
101. CNSC staff added that DSCs at the DWMF would be inspected twice in 2013, and that internal corrosion monitoring sensors have been developed and would be used by OPG to assess the condition of the inner steel liner of loaded DSCs.
102. The Commission sought more information on OPG's long-term plan for improvements in their waste management facilities. OPG representatives responded that they have two separate longer term plans: one for the low and intermediate waste, and the other for the high level waste including the spent fuel. The first one is related to a geological repository and an associated environmental assessment. The other one is related to a project led by the Nuclear Waste Management Organisation (NWMO) where OPG is engaged in a long-term adaptive phase management project and plan with a timelines having a proposed date in service around 2035.

Conclusion on Fitness for Service

103. 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 DWMF is fit for service.

Radiation Protection

104. As part of its evaluation of the adequacy of the provisions for protecting the health and safety of persons, the Commission considered the past performance of the DWMF in the area of radiation protection. The Commission also considered DWMF's program to ensure that both radiation doses to persons and contamination are monitored, controlled, and kept as low as reasonably achievable (ALARA).
105. This SCA includes the following specific areas:
 - Application of ALARA;

- Personnel Dosimetry;
- Contamination Control; and
- Worker Dose Control.

CNSC staff reviewed the performance trend for this SCA and rated it as satisfactory.

106. OPG informed the Commission that their radioactive contamination controls are in place and that radiological performance at the DWMF undergoes routine surveillance and monitoring to ensure compliance with OPG's Radiation Protection Program and applicable regulations.
107. OPG representatives added that key indicators used to measure the effectiveness of the Radiation Protection Program at OPG's nuclear waste facilities include monitoring results of collective dose and annual maximum individual doses, dose to the public, and contamination control.

Application of ALARA

108. OPG informed the Commission that DWMF's occupational radiation exposure continues to be in full compliance with regulatory requirements. OPG representatives added that collective exposure is monitored and ALARA targets are set annually and reviewed by senior management.
109. CNSC staff reported that they had reviewed OPG's ALARA assessment for the DWMF in 2009 and recommended that OPG update the facility's ALARA targets annually. As a result, OPG currently performs assessments of dose targets annually, and periodically performs detailed ALARA assessments. CNSC staff's review of the submitted ALARA targets for 2010 and 2011 as well as ALARA assessment in 2011 shows that doses to workers are maintained ALARA in all areas of operations at the DWMF.

Personnel Dosimetry

110. CNSC staff informed the Commission that OPG operates a CNSC-licensed external and internal dosimetry services licensed separately from the DWMF. These services monitor, assess, record and report doses of ionizing radiation received by employees, visitors and contractors as a result of OPG activities, where the main radiation hazard is gamma radiation from the spent nuclear fuel stored in DSCs.

Contamination Control

111. OPG representatives reported that their contamination control activities include workplace inspections, review of routine survey results, review of worker dose results

on a quarterly basis along with monitoring of environmental impacts, and compliance inspections by CNSC staff themselves. There were no identified losses of contamination control in excess of Action Levels or Regulatory Limits during the licensing period.

112. OPG representatives informed the Commission about their initiative to review their alpha radiation contamination monitoring and control program, and stated that results of alpha hazard characterization surveys demonstrate that the majority of work related to used fuel dry storage activities at DWMF is considered to be the lowest level of probability for alpha contamination.
113. CNSC staff informed the Commission that OPG has a program to monitor for loose surface contamination within the DWMF, and that, to date, no loose contamination has been detected within the DWMF or on DSCs within the facility. CNSC staff added that they had confirmed, through their own sampling and routine compliance inspections, that there was no loose contamination. CNSC staff added that airborne contamination is also monitored and that a potential for this type of contamination is minimal.
114. CNSC staff further informed the Commission that the optimal control of potential radioactive contamination is provided through an approved radiological zoning plan for the DWMF, with a Zone 1 area, which is defined as an area in which no contamination is expected and includes offices and lunch room of the amenities area and the security screening area at the entrance, and a Zone 2 area for the rest of the facility, which is defined as an area that is normally free of contamination but may be subject to cross-contamination due to movements of personnel and equipment.

Worker Dose Control

115. OPG representatives reported that, during the current licence period, doses to the workers remained significantly lower than the regulatory limit of 50 mSv/y (millisievert per year), and the five-year regulatory limit of 100 mSv. OPG representatives said that there were no recordable doses attributed to internal uptakes as measured by whole body counting or by urine bioassay.
116. CNSC staff reported that workers involved in radiological activities at the DWMF are deemed Nuclear Energy Workers (NEWs). CNSC staff noted that their review of the worker dose over the current licensing period indicates that radiation doses are being adequately controlled, that there were no action level exceedances and that none of the workers at the DWMF had received a radiation dose in excess of regulatory limits.
117. CNSC staff further reported that OPG's Radiation Protection Program includes gamma radiation monitoring and routine radiological surveys, and that dose measurements are displayed to inform workers of any potential radiological hazard. CNSC staff stated that they had verified that the posted dose values were accurate. CNSC staff added that OPG estimates doses to non-NEWs based on measured gamma radiation levels within

the facility, and submits the results to CNSC staff. A review of OPG's monitoring data indicated that the highest potential estimated radiation doses to non-NEWs at the DWMF perimeter fence were about ten times smaller than the regulatory dose limit of 1 mSv/y. The observed minor annual increase in maximum dose is directly attributable to the increase in stored DSCs and resulting radioactive inventory in the facility.

Conclusion on Radiation Protection

118. The Commission is of the opinion that, given the mitigation measures and safety programs that are in place or will be in place to control hazards, OPG will provide adequate protection to the health and safety of persons, the environment and national security.

Conventional Health and Safety

119. Conventional health and safety covers the implementation of a program to manage workplace safety hazards. The conventional health and safety program is mandated by provincial statutes for all employers and employees to minimize risk to the health and safety of workers posed by conventional (non-radiological) hazards in the workplace. This program includes compliance with the applicable Labour Codes and conventional safety training. CNSC staff assessed this safety and control area and rated it as fully satisfactory.
120. OPG informed the Commission that all conventional health and safety hazards were being managed effectively by the implementation and continuous improvement of the NWMD health and safety management system.
121. OPG further informed the Commission that the NWMD's Conventional Safety Program was currently transitioning towards OPG Nuclear governance defined in Conventional Safety. The requirements of the *Occupational Health and Safety Act of Ontario* are the responsibility of the Darlington NGS Joint Health and Safety Committee, which meets once a month and inspects the DWMF once every two months.
122. OPG representatives added that they monitor all injury rates, accident severity rate and the maximum reasonable potential for harm, and noted that DWMF had not incurred any medically treated injuries or loss time accidents, or an accident causing a permanent total or partial disability since it began operating in 2007.
123. CNSC staff reported that OPG's nuclear waste management facilities are regulated by the *Occupational Health and Safety Act of Ontario*, the *Ontario Labour Relations and Employment Statute Law Amendment Act* and the *Ontario Labour Relations Act*. CNSC staff noted that the conventional hazards at the facility are mainly associated with the control and safe handling of hazardous materials and heavy equipment.

124. CNSC staff further reported that they make their observations on safety practices, general housekeeping and the controls employed to address conventional hazards during routine compliance inspections at the DWMF, and noted that the provincial Ministry of Labour had conducted independent inspections. CNSC staff stated that they had confirmed with the Ministry of Labour that there were no lost time accidents and that there are no outstanding issues at the facility.
125. CNSC staff noted that they had participated in OPG's pre-job work briefings related to the work being conducted at the facility at the time of inspection and any associated hazards.
126. The Commission is of the opinion that the health and safety of workers and the public was adequately protected during the operation of the facility for the current licence period, and that the health and safety of persons will also be adequately protected during the continued operation of the facility.

Environmental Protection

127. Environmental Protection covers OPG's programs to identify, control and monitor all releases of nuclear substances and to minimize the effects on the environment which may result from the licensed activities. It includes the following:
 - Effluent and emissions control;
 - Environmental monitoring;
 - Estimated doses to the public; and
 - Environmental management system.

CNSC staff had reviewed this safety and control area and rated it as satisfactory.

Effluent and Emissions Control

128. CNSC staff informed the Commission that the monitoring of site-wide activities and ventilation exhaust lines, and review of the monitoring results, have shown that gaseous and aqueous releases of nuclear substances as a result of activities in the processing and storage buildings indicates that these releases have remained below regulatory limits throughout the licence period.
129. T. Seitz, in his intervention, expressed concerns related to continuous accumulation and associated storage and dispersion issues of tritium produced during operation of power reactors, and pointed to a disproportionately large amount of stored used fuel in Canada compared to the USA, which has only twice as much of stored high-level nuclear waste with several times higher number of operating nuclear reactors. The Commission asked OPG about their approach to the problem of accumulating tritium. OPG representatives responded that the releases of tritium from the site are very low

and every pathway outside of the plant is monitored. Heavy water is contained and OPG uses their de-tritiated facility to capture tritium as an oxide, which is stored onsite.

130. The Commission asked if the onsite storage capacity for tritium was adequate in case that the power plant's life is extended for another 30 years. The Commission also enquired about long-term plans for tritium storage and plans to take tritium into the projected deep geological repository. OPG representatives responded that, for the short and medium term, the capacity for tritium storage is adequate. With respect to long-term storage, OPG representatives said that the deep geological repository was not established for the purpose of handling tritium waste, taking into account its half-life and total decay of the order of one hundred years.
131. The Commission further asked OPG to comment on the issue of the amount of stored high-level nuclear waste in Canada and its comparison with the USA. OPG representatives responded that the volume of the stored waste from CANDU reactors is larger due to the fact that this type of reactor uses natural uranium for the fuel, with uranium concentration much lower than in the case of enriched uranium fuel.

Environmental Monitoring

132. OPG informed the Commission that the environmental management system implemented at the DWMF site includes monitoring, assessment and control of the environmental risks associated with the licensed activities, and ensures that potential adverse impact on the natural environment follows ALARA principles.
133. OPG further informed the Commission that radiological monitoring has been in place since the start of DWMF operation and that the associated programs are designed to monitor releases of radionuclides by sampling and analyzing the liquid effluent discharges, by monitoring the airborne emissions, and by measuring the average ambient radiation dose rates at the perimeter of the DWMF. These monitoring activities encompass waterborne releases from yard and facility drainage systems, and airborne emissions.
134. CNSC staff informed the Commission that OPG operates under a Certificate of Approval (C of A) for Industrial Sewage issued by the Ontario Ministry of the Environment, and noted that OPG did not report any exceedance of the limits under the C of A during the licence period.
135. CNSC staff further informed the Commission that they had reviewed OPG's quarterly environmental monitoring results, which show that releases of nuclear substances to air and water have remained below licence limits during the current licence period.
136. With respect to the EA conducted for the operating licence for the DWMF, CNSC staff reported that OPG had submitted the EA follow-up program monitoring results and

requested closure of the follow-up program. After evaluating the submitted results, CNSC staff concluded that OPG had adequately completed the program and considered the follow-up monitoring program closed.

Estimated Dose to the Public

137. OPG informed the Commission that there are 12 environmental thermoluminescent dosimeters mounted on the perimeter fence of the DWMF, which are changed and analyzed quarterly, and results are included in the quarterly reports submitted to the CNSC. OPG representatives noted that the DWMF's contribution to public dose is incorporated into the Darlington NGS Radiological Environmental Monitoring Program, as the DWMF is situated adjacent to the Darlington NGS. The public dose contributed by the whole Darlington site is well below the regulatory limit of 1 mSv/y, of which DWMF represents a small portion .
138. CNSC staff reported that their review of OPG's radiological environmental monitoring results indicated that releases of nuclear substances to air and water discharges from the DWMF, for the period of 2007-2011, had remained within licence limits, and that the maximum doses to the public had remained well below the regulatory dose limit of 1 mSv/y during the current licence period.

Environmental Management System

139. OPG representatives informed the Commission about the updates they had made to address new requirements in the 2010 edition of CSA N288.4 *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*, and said that the completion of all phases will take place over the next three years with the first annual Environmental Monitoring Program report scheduled for 2014.
140. CNSC staff reported that they had assessed the Environment, Safety and Health and Safety Management program at the DWMF, which had been implemented by OPG. CNSC staff is of the opinion that this program meets the requirements of the CNSC's document S-296: *Environmental Protection Policies, Programs and Procedures at Class I Nuclear Facilities and Uranium Mines and Mills*. CNSC staff added that OPG's environmental management system had been re-certified for ISO 14001 in 2009.
141. CNSC staff further reported that OPG had revised its programs to comply with the CSA standard N288.4: *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* to include radioactive and hazardous substances, physical stressors, potential biological effects, and pathways for both human and non-human biota, and that full implementation of this CSA standard is expected by December 31, 2015.

142. CNSC staff also reported that OPG would be transitioning to a new corporate nuclear program from the current Environmental Health and Safety Management, and complete its full implementation by February 28, 2013.

Conclusion on Environmental Protection

143. Based on the above information, the Commission is satisfied that, given the mitigation measures and safety programs that are in place to control hazards, OPG will provide adequate protection to the health and safety of persons and the environment.

Emergency Management and Fire Protection

144. Emergency management and fire protection covers the provisions for preparedness and response capabilities which exist for emergencies and for non-routine conditions at the DWMF. This includes nuclear emergency management, conventional emergency response, and fire protection and response. CNSC staff has reviewed this safety and control area and rated OPG's performance as satisfactory.

Nuclear Emergency Management

145. OPG representatives presented the Consolidated Nuclear Emergency Plan that is used to manage the Emergency Response and Fire Protection at the DWMF and explained that the approach to emergency response is based on the principle that each emergency will be managed as close as possible to the incident area. They added that the initial emergency response and medical aid for DWMF rests with the Municipality of Clarington, with the support from the Darlington NGS Emergency Response Team.
146. OPG representatives informed the Commission about spill drills that were conducted at the DWMF in conjunction with Darlington NGS, and stated that, during the last one conducted in August 2012, there were no adverse conditions identified relating to the DWMF.
147. As a result of post-Fukushima event activities, OPG decided to develop an emergency preparedness procedure to improve the post-event worker response, and to partner with other operators and with the community to enhance emergency response capability to establish an off-site Regional Emergency Response Centre. OPG noted that they were also purchasing additional emergency communication systems.
148. CNSC staff informed the Commission that the emergency response for the DWMF is provided by the Clarington Municipal Emergency Services, since the facility is outside of the Darlington NGS "protected area", and that a Memorandum of Understanding exists between Clarington Fire Services and the DWMF since January 1, 2007.

149. CNSC staff further informed the Commission that they were satisfied with the outcome of their Type II augmented inspection of the DWMF conducted on November 22, 2011 to verify the adequacy of the emergency preparedness program. CNSC staff noted that the program was compliant with the applicable sections of CNSC Regulatory Document G-225 *Emergency Planning at Class I Nuclear Facilities and Uranium Mines*. No actions or recommendations resulted from this inspection.
150. The Commission asked OPG to comment on concerns expressed by Sierra Club, according to which OPG does not consider nuclear accidents involving criticality, which may result in an acute release of radioactivity into the environment. OPG representatives stated that, with average concentration of 0.7 % typical for natural uranium used to make fuel elements for CANDU reactors, it is not physically possible to reach critical mass needed for a chain reaction during the storage of used fuel in their spent fuel pool or irradiated fuel bay.

Conventional Emergency Response

151. CNSC staff reported that emergency, medical and fire responses for the DWMF are provided by the Municipality of Clarington with support from the Darlington NGS. In order to independently confirm agency responsibilities in relation to the facility, CNSC staff contacted the Municipal Fire Department and the local Emergency Medical Services (EMS). Through these contacts, CNSC staff had been informed that all equipment issues have been resolved with OPG and that there were no concerns or issues regarding an emergency response to the facility. CNSC staff added that EMS staff participates in Darlington NGS site drills, and noted that EMS respond to the Darlington Site for medical emergencies approximately 12 times a year.

Fire Protection

152. OPG informed the Commission that they have a fire protection procedure in place and that the DWMF is equipped with fire detection and protection systems in accordance with the National Fire Code of Canada and the National Building Code of Canada. OPG representatives added that the initial fire response for the DWMF rests with the Municipality of Clarington with the support from the Darlington NGS Emergency Response Team. They explained that a Memorandum of Understanding between the Municipality of Clarington and OPG exists that applies to the provision of fire protection services, including coordinated emergency response. In the event of a major off-site incident, OPG is to assist Clarington, if requested.
153. OPG further informed the Commission that inspections, drills and testing of the fire detection and protection system are performed in accordance with the National Fire Code of Canada. OPG representatives said that a non-OPG company annually inspects safety of the fire detection and protection system.

154. CNSC staff confirmed that the DWMF has a Fire Protection Program in place to minimize both the probability of occurrence and the consequences of fire at the facility. The program complies with the requirements of the “*National Building Code of Canada*” and the “*National Fire Code of Canada*”.
155. CNSC staff reported that they had performed compliance inspections and concluded that the overall physical condition and operation of the facility is satisfactory with respect to fire protection.
156. CNSC staff further reported that OPG had reported three unplanned events at the DWMF during the licence period in the area of fire protection, and stated that OPG staff took the appropriate actions following the events, notified the CNSC as required and conducted the appropriate follow-up investigations.
157. The Commission asked about fire resistance of DSCs. OPG representatives responded that DSCs are impervious to fire, based on their design and testing results.

Conclusion on Emergency Management and Fire Protection

158. Based on the above information, the Commission concludes that the fire protection measures and emergency management preparedness programs in place, and that will be in place, at the facility are adequate to protect the health and safety of persons and the environment.

Waste Management

159. Waste management covers the licensee’s site-wide waste management program. CNSC staff evaluated OPG’s performance related to waste minimization, segregation, characterization, and storage, and rated it as satisfactory.
160. OPG informed the Commission that their waste management program covers the management of the waste generated during the operations of DWMF up to the point where the waste is removed from the facility to a separate waste management facility.
161. OPG representatives noted that some radioactive waste is generated at DWMF and processed through the waste management program at the Darlington NGS. They added that non-radioactive wastes are minimized through re-use and separation at source using designated collection/sorting points throughout the DWMF, and are sent for recycling or to a conventional landfill.
162. CNSC staff reported that they had conducted routine compliance inspections to observe OPG’s minimization of radioactive waste by segregating “likely-clean” material at the DWMF. CNSC staff noted that very little waste was generated during operations, and that they were satisfied that OPG’s DWMF activities meet CNSC Policy P-290

Managing Radioactive Waste.

163. With respect to waste processing and storage, CNSC staff reported that all waste resulting from the operation of the DWMF is monitored for radioactive contamination prior to leaving the facility. Any contaminated waste is transferred to the Darlington NGS and managed through their waste storage and processing program. CNSC staff added that they had collected samples and performed direct measurements to confirm OPG's finding that there was no radioactive contamination at the DWMF.
164. In their intervention, Northwatch expressed concerns regarding continuous production of nuclear waste, inadequacy of a long-term waste management plan and risks associated with transportation of spent fuel and other radioactive waste from nuclear power plants to long-term storage facilities, such as deep geological repositories. The Commission enquired about potential transportation problems stemming from the weight of storage containers. OPG representatives noted that transportation of spent fuel to its final repository falls under the Nuclear Waste Management Organization (NWMO) mandate, which is currently conducting a study related to this issue for OPG and other CANDU users. NWMO representatives explained the transportation procedure and said that there would be either shipping of the used fuel from the nuclear stations in the dry storage containers to the Adaptive Phase Management Facility for long-term management of used nuclear fuel, or there would be a transfer of the used fuel bundles at the reactor site into transportation-specific containers or casks. These activities would be licensed by the CNSC.
165. Asked by the Commission to provide more details on their study, NWMO representatives responded that the NWMO has done a number of transportation studies as part of their long-term plans for a nuclear fuel waste repository. CNSC staff commented that the long-term management plans for the used fuel were out of the scope of the environmental assessment for the refurbishment and extended operation. CNSC staff further explained that any plans by the NWMO to move forward with a project related to a long-term nuclear waste repository would require a licence from the CNSC and would trigger a separate environmental assessment. However, CNSC staff pointed out that licensing of every facility contains a specific safety case for the waste management related to the operations of that facility.
166. Responding to the Commission's question whether transportation conditions had been taken into account in designing the containers, OPG stated that these containers were certified by CNSC and approved for road transportation. CNSC staff confirmed that the containers meet international standards for transportation.
167. Responding to the remark by Northwatch that one type of container has been approved and a cask of similar characteristics is in use at Darlington site, CNSC staff stated that any modification made to containers to improve safety of operation has been reviewed and approved by the CNSC prior to implementation and that there is no component of the facility that would be allowed to operate without an approval by CNSC.

168. The Commission sought more information on OPG's efforts to minimize the amount of radioactive waste through improvements to be implemented during the refurbishment. OPG representatives responded that, while there were some unique aspects to refurbishment, overall waste volume reduction was a specific focus of OPG so that they have undertaken successful pilot studies to develop alternative processing techniques for re-sorting and reduction of waste that had been stored for a number of years in their storage facilities.
169. Based on the above information and considerations, the Commission is satisfied that OPG is safely managing waste at the DWMF.

Security

170. OPG informed the Commission that OPG's security program meets industry best practices and all regulatory requirements, and ensures the security of DWMF's assets through physical and administrative security measures.
171. CNSC staff reported that they have assessed the following specific areas of this SCA:
- Facilities and Equipment;
 - Access Control;
 - Training, Exercises and Drills; and
 - Nuclear Response Force.

CNSC staff rated the performance of OPG in this SCA as fully satisfactory.

172. CNSC staff further reported that DWMF is a Class 1B nuclear facility for the purpose of waste management, storing Category II nuclear material as defined in the *Nuclear Security Regulations*⁸ and that OPG has a security program in place for the DWMF in accordance with CNSC requirements. CNSC staff added that OPG had provided a transportation security plan which meets the requirements of Section 5 of the NSR and Regulatory Document G-208, *Transportation Security Plans for Category I, II or III Nuclear Material*.
173. CNSC staff informed the Commission that they had inspected DWMF security in 2011 and that they had rated OPG's security program as fully satisfactory for this inspection. CNSC staff added that DWMF had no reportable security-related events in the last year.
174. With respect to the facilities and equipment, CNSC staff reported that OPG has demonstrated compliance in this program area through the provision of adequate infrastructure, physical delay barriers, procedures, systems, devices and security personnel to meet its security program requirements. OPG has also preventative and

⁸ S.O.R./2000-209

corrective maintenance programs in place for critical security systems and devices.

175. CNSC staff stated that OPG complies with requirements regarding access control through the provision of an effective program to control access to facilities, nuclear material and prescribed/classified information.
176. CNSC staff added that OPG validates its security procedures and regulatory compliance, and identifies areas for improvement by implementing training, exercises and drills.

The implementation is conducted through a Drill, Tabletop and Exercise Program dedicated to Nuclear Security Officers assigned to DWMF. CNSC staff said that OPG maintains a Nuclear Response Force at the Darlington site and has a written arrangement with the Durham Regional Police Service if additional response force services are required.

177. The Commission is satisfied that OPG's performance with respect to maintaining security at the facility has been adequate.

Safeguards

178. The CNSC's regulatory mandate includes ensuring conformity with measures required to implement Canada's international obligations under the Treaty on the Non-Proliferation of Nuclear Weapons. Pursuant to the Treaty, Canada has entered into safeguards agreements with the IAEA. The objective of these agreements is for the IAEA to provide credible assurance on an annual basis to Canada and to the international community that all declared nuclear material is in peaceful use and that there is no undeclared nuclear material or activities in this country.
179. OPG informed the Commission that they had adopted the integrated safeguards protocol in accordance with the IAEA requirements for their DWMF operations. OPG representatives reported about the self-assessment conducted in 2011 and resulting enhancements implemented to improve the performance in this safety and control area. They said that DWMF is currently in compliance with RD-336: *Accounting and Reporting of Nuclear Material* and that they were upgrading OPG's Nuclear Fuel Location and Storage History software program, which is IAEA/CNSC approved and used by OPG for fuel accounting.
180. OPG representatives added that a Safeguards action group within the NWMD meets twice yearly to review ongoing performance and develop and monitor plans to address emerging issues.
181. CNSC staff informed the Commission that their assessment of this SCA included nuclear material accountancy and control, access and assistance to the IAEA, operational and design information, and safeguards equipment, containment and

surveillance. CNSC staff rated OPG's performance in this SCA as satisfactory.

182. CNSC staff reported that OPG maintains a safeguards program and had modified its nuclear material accounting system to implement accounting and reporting requirements stipulated by RD-336, *Accounting and Reporting of Nuclear Material*. CNSC staff added that the IAEA and CNSC have performed a number of inspections during the licence period, and that OPG had provided the requested documents and assistance in all cases. CNSC staff noted that there were no reportable events or action notices issued as a result of these inspections.
183. 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 DWMF that are necessary for maintaining national security and measures necessary for implementing international agreements to which Canada has agreed

Packaging and Transport

184. Packaging and transport covers the safe packaging and transport of nuclear substances to and from the DWMF. The DWMF must adhere to the *Packaging and Transport of Nuclear Substances Regulations*⁹ and Transport Canada's *Transportation of Dangerous Goods Regulations*¹⁰ for all shipments leaving the site. The *Packaging and Transport of Nuclear Substances Regulations* apply to the packaging and transport of nuclear substances, including the design, production, use, inspection, maintenance and repair of packages, and the preparation, consigning, handling, loading, carriage and unloading of packages containing nuclear substances. CNSC staff evaluated OPG's performance in this SCA and rated it as satisfactory.
185. OPG informed the Commission that there was no off-site transportation of used fuel to or from the DWMF, and noted that they are designing a new type of containers designated for fuel channel component waste produced by the planned retubing of the Darlington reactors, and that they intend to apply to the CNSC for the certification of these containers during the next licence period.
186. OPG representatives reported that there were six minor motor vehicle collisions during the past 40 years involving OPG radioactive shipments from all locations, and that there had been no releases of radioactive material to the environment, and no serious injuries as a result of these collisions.
187. CNSC staff reported that they had assessed on-site transport of spent nuclear fuel on the Darlington NGS site and observed that this activity had been performed in accordance with OPG programs and procedures. CNSC staff added that there have been no reportable events related to the on-site transport of spent nuclear fuel.

⁹ SOR/2000-208

¹⁰ SOR/2001-286

188. CNSC staff informed the Commission that, for on-site shipments between the Darlington NGS and the DWMF, OPG is not required to comply with the CNSC's *Packaging and Transport of Nuclear Substances Regulations*. Since there are no specific rules for on-site packaging and transport, OPG provides an equivalent degree of safety to workers, the general public and the environment as would have been achieved for off-site transportation.
189. In her intervention, B. J. Moore expressed concerns with respect to transporting radioactive spent fuel rods on narrow highways with increased risk of vehicle accidents. The Commission asked OPG about using highways to transport reactor fuel rods. OPG representatives responded that there is very limited number of transfers of spent fuel, typically once or twice a year to AECL Chalk River, and noted that these transfers are done consistently with all the requirements and transportation safety measures that are required. OPG representatives added that the record shows that for more than 40 years, shipments were done with no incidents resulting in a release to the environment.
190. The Commission asked about the level of safety measures applied for the on-site transport. CNSC staff responded that OPG provides an equivalent degree of safety, and that safety measures have been respected the same way as if the package is going outside of the facility. There are no licence requirements, since a package does not go on public roads, but the safety of the workers is the same as the safety for the public.
191. Base on the above information, the Commission is satisfied that OPG is meeting regulatory requirements regarding packaging and transport.

Aboriginal Consultation

192. The common law Duty to Consult with Aboriginal communities and organizations applies when the Crown contemplates actions that may adversely affect established or potential Aboriginal or treaty rights.
193. OPG informed the Commission that they have a board-level policy regarding First Nation and Métis, and active community relations program that focuses on community relations and outreach, supporting the communities, employment and business contracting opportunities, and settlement of past grievances. OPG continues to engage in active dialogue with First Nations and Métis people on a number of issues and operational decisions related to OPG's nuclear operations. For that purpose, an up-to-date stakeholder list is maintained and used to electronically share quarterly waste management performance reports, announcements and changes in operations interest to the communities.
194. CNSC staff informed the Commission that, since the DWMF licence renewal has linkages to the EA for the Darlington Refurbishment and Continued Operation, the

Aboriginal consultation for the DWMF is being conducted in coordination with the EA and OPG's 22-month Power Reactor Operating Licence application.

195. CNSC staff explained that the identified Aboriginal groups and organizations were mailed information regarding OPG's applications, including a timeline of coordinated activities, instructions on how to receive announcements, contact information, and an overview of the CNSC public hearings process. CNSC staff provided information concerning the CNSC's Participant Funding Program, noting that the Williams Treaties First Nations applied for and were granted funding under the program.
196. CNSC staff stated that, during their consultations with Aboriginal groups, participants did not identify adverse impacts to established or potential Aboriginal and treaty rights. CNSC staff further noted that it would continue to engage with and provide all the identified Aboriginal groups with project information.
197. The Williams Treaties First Nations, in their intervention, provided information about their participation in the review of OPG's licence renewal application, noting that they had received participant funding from the CNSC. The Commission enquired about the level of consultation held to-date. The Williams Treaties First Nations stated that they felt that the consultation activities with CNSC staff and OPG for the current licensing application and concurrent refurbishment environmental assessment had begun to be more meaningful and noted that they wanted them to continue. The Williams Treaties First Nations noted that they would be active in the future CNSC licensing processes for the Darlington NGS.
198. The Mississaugas of the New Credit First Nation, in their intervention, expressed the desire to further build its relationship with both the CNSC and OPG and to be engaged in meaningful consultation on future licence applications. The Commission asked about the existing communications between the Mississaugas of the New Credit First Nation and OPG. An OPG representative responded that OPG has met with the Mississaugas of New Credit First Nation a number of times and provided information regarding its projects. The OPG representative noted OPG's commitment to continue to develop their relationship.
199. The Commission enquired about the CNSC's consultation with the Mississaugas of New Credit First Nation. CNSC staff responded that it had interacted with them and provided information on OPG's activities, as well as on the CNSC's Participant Funding Program. The Commission asked the Mississaugas of New Credit First Nation why they did not apply for participant funding. The Mississaugas of New Credit First Nation explained that it has a limited ability to go through all of the paperwork in its office and that it had been occupied with other matters. CNSC staff noted that there would be further opportunities for participation in future hearing processes related to the Darlington NGS, and stated that it would continue to engage Aboriginal groups on these matters. CNSC staff further stated that it would continue to look for ways to improve its consultation activities.

200. The Commission asked if the CNSC has a straightforward way of informing Aboriginal groups and members of the public of its upcoming hearings and the deadlines associated with participation in these hearings, including funding. CNSC staff responded that there is information on the CNSC Web site and noted that all interested parties can subscribe to receive electronic notices from the CNSC. CNSC staff noted that it would follow-up with the Mississaugas of New Credit First Nation on this matter.
201. The Commission acknowledges the efforts made in relation to the CNSC's obligations regarding Aboriginal consultation and the Legal Duty to Consult. The Commission is satisfied that the proposed licence renewal will not cause any adverse impacts to any potential or established Aboriginal or treaty rights and that the consultation activities undertaken for this licence renewal were adequate, given that there are no changes to the licensed activities at the DWMF and Darlington NGS¹¹.

Public Information Program

202. A public information program is a regulatory requirement for licence applicants and licensed operators of Class I nuclear facilities licensed as Class IB facility. Paragraph 3(j) of the *Class I Nuclear Facilities Regulations*¹² requires that licence applications include “*the proposed program to inform persons living in the vicinity of the site of the general nature and characteristics of the anticipated effects on the environment and the health and safety of persons that may result from the activity to be licensed.*”
203. OPG informed the Commission that their external communication and associated community stakeholder activities are governed by their standard “External Communications”, and stated that OPG follows a Public Interest Notification protocol to notify in a timely manner key community stakeholders about its on-going facility activities, public and environmental impact, transportation program and to consult with key stakeholders and the public on future planned activities. OPG representatives stated that OPG was reviewing its public information and disclosure policies, and was revising them as needed to ensure compliance with the requirements by the end of 2012.
204. OPG further informed the Commission that they develop yearly plans for community engagement and consultation regarding OPG's business strategy to build community awareness and support of OPG and site operations. They added that the plan for this year included public information regarding this hearing process that combines three approval considerations: Darlington NGS Licence Renewal, DWMF Licence Renewal and the approval of Refurbishment EA for Darlington Nuclear and Continued Operations.

¹¹ Rio Tinto Alcan v. Carrier Sekani Tribal Council, 2010 SCC 43, [2010] 2 S.C.R. 650 at paras 45 and 49.

¹² SOR/2000-204

205. OPG representatives said that they regularly provide milestones and updates to key stakeholders through presentations at the Darlington Site Planning Committee and the Durham Nuclear Health Committee. OPG also communicates with the public through project presentations, station tours, open house and informal meetings, and educational community program supported by OPG's Corporate Citizenship Program. In addition, information related to nuclear waste management is highlighted in bulletins distributed quarterly to 110 000 residents and businesses in the area, in Quarterly Performance Reports distributed to key stakeholders and available on the OPG web site, and through activities of the Darlington Nuclear Public Information Centre. They added that OPG considers creating a community advisory committee to engage community leaders and business community in two-way communications.
206. CNSC staff reported that OPG has a public information program that includes a range of activities from briefings to local community committees, engagement of local community at festivals and events, distribution of newsletters, a detailed website and facility tours to municipal and local officials.
207. CNSC staff further reported that OPG has a number of communication protocols and policies in place and is currently reviewing its public disclosure policy to reflect the new draft requirements of a Public Disclosure Protocol, as detailed in recently published CNSC Regulatory Document RD/GD-99.3 *Requirements and Guidance for Public Information and Disclosure*.
208. 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.

Decommissioning Plans and Financial Guarantee

209. 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 DWMF 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.
210. OPG informed the Commission that OPG's management system for decommissioning was defined under its Decommissioning Charter, and the objective of the decommissioning planning was to demonstrate the technical and financial feasibility of decommissioning DWMF in a manner that will ensure the health, safety and security of workers, the public and the environment. OPG stated that the decommissioning activities have to conform to the requirements of CSA Standard N294-09: *Decommissioning of Facilities Containing Nuclear Substances*, CNSC Guides G-206 *Financial Guarantees for the Decommissioning of Licensed Activities* and CNSC G-219 *Decommissioning Planning for Licensed Activities*.

211. OPG representatives explained that the scope of the DWMF Preliminary Decommissioning Plan (PDP) includes the DSC Processing Building, DSC Storage Buildings #1, the planned DSC Storage Building #2, Refurbishment Waste Storage Building and the surrounding site within the licensed area. The PDP was submitted and accepted by the CNSC in 2007 and updated in 2012. It has been accepted by the Commission, with OPG's proposed revision to its consolidated financial guarantee, in October 2012.
212. CNSC staff reported that OPG maintains a consolidated financial guarantee for decommissioning its Ontario owned facilities including the following: Bruce "A" and "B" NGSs, Darlington NGS, Pickering "A" and "B" NGSs, DWMF, PWMF and the WWMF. The financial guarantee that was accepted by the Commission for these facilities includes the following components:
- segregated funds established pursuant to the Ontario Nuclear Funds Agreement (ONFA) between OPG and the Province of Ontario (the "ONFA Funds");
 - the trust fund for the management of spent fuel established pursuant to the *Nuclear Fuel Waste Act* (the "NFWA Trust"); and
 - the Provincial Guarantee pursuant to the Provincial Guarantee Agreement between the CNSC and the Province of Ontario.

The consolidated financial guarantee for decommissioning of OPG's Ontario facilities totals the amount of CAD 14.2 billion, with a supplemental provincial guarantee of CAD 1.5 billion.

213. Some intervenors, including individuals, the Green Party of Ontario, and FullCircle Energy Solutions Inc., Trillium Power Wind Corporation and Solsmart Energy Solutions Inc., expressed concerns regarding the future costs of decommissioning and waste storage, suggesting that the burden would be borne by future generations. The Commission sought confirmation that the decommissioning funds would also include the long-term storage of wastes. OPG stated that this was the case and that it would fund the full costs associated with decommissioning.
214. Some intervenors, including individuals and the Canadian Coalition for Nuclear Responsibility, were of the view that the costs associated with decommissioning had been underestimated. The Commission enquired about this matter. CNSC staff responded that the decommissioning costs are based on actual decommissioning projects, including international ones.
215. Based on this information, the Commission considers that the preliminary decommissioning plans and related financial guarantee are acceptable for the purpose of the current application for licence renewal.

Nuclear Liability Insurance and Cost Recovery

216. CNSC staff informed the Commission that a Class I licensed nuclear facility is subject to the requirements of Part 2 of the *CNSC Cost Recovery Fees Regulations*¹³, and reported that OPG has consistently paid their cost recovery fees in full.
217. The *Nuclear Liability Act*¹⁴ requires the DWMF to have coverage for nuclear liability insurance. OPG informed the Commission that the company maintains the required nuclear liability insurance for DWMF.
218. The Commission is satisfied that OPG has the coverage required under the *Nuclear Liability Act*.

Licence Length and Conditions

219. OPG has applied to renew the operating licence for DWMF for a period of ten years. OPG has also requested the Commission's approval for the expansion of this facility to accommodate waste from the reactors and used fuel from continued, post-refurbishment operation.
220. CNSC staff supported this request and recommended that the Commission renew the current Waste Management Operating Licence, and authorize the construction and operation of two additional storage buildings.
221. OPG informed the Commission on its intention to apply for consolidation of their three Class 1B nuclear waste facility licences into one Class 1B nuclear waste facility licence with the new licensing structure for the Pickering, Darlington and Western Waste Management Facilities.
222. Based on the above information and considerations, the Commission is satisfied that a 10-year licence with annual reporting is appropriate. The Commission authorizes the construction and operation of the two additional storage buildings. The Commission accepts the licence conditions and the delegation of authority as recommended by CNSC staff, and notes that it can bring any matter to the Commission as applicable.

CONCLUSION

223. The Commission has considered the information and submissions of CNSC staff, OPG 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.

¹³ S.O.R./2003-212

¹⁴ R.S.C., 1985, c. N-28.

224. 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. The Commission is satisfied that the environmental assessment required for the construction and operation of two additional storage buildings was included in the environmental assessment completed for the Darlington NGS Refurbishment and Continued Operation Project.
225. The Commission is satisfied that OPG meets the requirements of subsection 24(4) of the *Nuclear Safety and Control Act*. That is, the Commission is of the opinion that OPG is qualified to carry on the activity that the proposed licence will authorize and that 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.
226. Therefore, the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews Ontario Power Generation's Waste Management Operating Licence WFOL-W4-355.00/2013 for its Darlington Waste Management Facility (DWMF) located in Darlington, Ontario. The licence, WFOL-W4-355.00/2023, will be valid from March 13, 2013 to April 30, 2023. This decision includes the authorization to construct and operate two additional waste storage buildings after the completion and approval of the EA.
227. The Commission includes in the licence the conditions as recommended by CNSC staff and set out in the draft licence attached to CMD 12-H14.
228. The Commission also accepts CNSC staff's recommendation regarding the delegation of authority in the Licence Conditions Handbook (LCH). The Commission notes that CNSC staff can bring any matter to the Commission as applicable. The Commission directs CNSC staff to inform the Commission on an annual basis of any changes made to the LCH.
229. With this decision, the Commission expects that CNSC will provide its next consolidated report on the performance of the waste management facilities in 2014, insofar as it does not include waste management facilities in the Nuclear Cycle and Facilities Regulation Annual Report. CNSC staff shall present this report at a public proceeding of the Commission.



MAR 13 2013

Michael Binder
President,
Canadian Nuclear Safety Commission

Date

Appendix A – Intervenors

Intervenors	Document Number
Sierra Club Ontario, represented by C. Elwell; K. Jackson and B. Cheng	CMD 12-H13.2
Tim Seitz	CMD 12-H13.3
Canadian Environmental Law Association, represented by T. A. McClenaghan	CMD 12-H13.4
Canadian Association of Nuclear Host Communities, represented by L. Thompson, Mayor of the Municipality of Port Hope	CMD 12-H13.5
Canadian Association of Physicians for the Environment, represented by Dr C. Vakil	CMD 12-H13.6 CMD 12-H13.6A
Laura Moyihan	CMD 12-H13.7 CMD 12-H13.7A
Durham Nuclear Health Committee	CMD 12-H13.8
Environmental Earth Angels	CMD 12-H13.9
Marilyn McKim	CMD 12-H13.10
Don and Heather Ross	CMD 12-H13.11
Whitby Chamber of Commerce	CMD 12-H13.12
Carlene Jimenez	CMD 12-H13.13
County Sustainability Group	CMD 12-H13.14
Emilio Antonio Aljure	CMD 12-H13.15
AECL'S Port Hope Area Initiative Management Office	CMD 12-H13.16
Rick Norlock, MP, Northumberland-Quinte West	CMD 12-H13.17
Julie Lamb	CMD 12-H13.18
Green Party of Saskatchewan	CMD 12-H13.19
Darlene Buckingham	CMD 12-H13.20
Brenda Thompson	CMD 12-H13.21
Timothy Law	CMD 12-H13.22
Ajax-Pickering Board of trade	CMD 12-H13.23
Municipality of Kincardine, represented by Mayor L. Kraemer	CMD 12-H13.24 CMD 12-H13.24A
The Firehouse Youth Centre	CMD 12-H13.25
Pickering Nuclear Community Advisory Council, represented by J. Vincett, J. Dike, D. Shier, P. Mattson, J. Sarley, J. Earley	CMD 12-H13.26
Michelle Xuereb	CMD 12-H13.27
Joanna Bruszewski and her grandchildren	CMD 12-H13.28
Big Brothers Big Sisters of Clarington	CMD 12-H13.29
Municipality of Clarington Represented by Mayor A. Foster and G. Weir	CMD 12-H13.30 CMD 12-H13.30A
Ysabeault d'Valar-Alba	CMD 12-H13.31
Monica Whalley	CMD 12-H13.32 CMD 12-H13.32A
Dan Rudka	CMD 12-H13.33
Jessica Rowland	CMD 12-H13.34

Jill Lennox	CMD 12-H13.35
Jack Murphy	CMD 12-H13.36
Carrie Lester	CMD 12-H13.37
The Valleys 2000 (Bowmanville) Inc.	CMD 12-H13.38
Nadine Hawkins	CMD 12-H13.39
Melita Fernandes	CMD 12-H13.40
Mike Darmon	CMD 12-H13.41
William and Edith Shore	CMD 12-H13.42
Karen Lock	CMD 12-H13.43
James M. Ker	CMD 12-H13.44
Harry Blundell	CMD 12-H13.45
Lilly Noble	CMD 12-H13.46
Frank Farrell	CMD 12-H13.47
Barbara J. Moore	CMD 12-H13.48
Lorraine Roulston	CMD 12-H13.49
Eryl Court	CMD 12-H13.50
Linda and Gord Hicks and Family	CMD 12-H13.51
Shane Mulligan	CMD 12-H13.52
Tony McQuail	CMD 12-H13.53
Dan Holtl	CMD 12-H13.54
Tania Gill	CMD 12-H13.55
Renee Cotton	CMD 12-H13.56
Andrea Peloso	CMD 12-H13.57
Clarington Board of Trade and Office of Economic Development, represented by S. Hall	CMD 12-H13.58
Bruce Power, represented by F. Saunders	CMD 12-H13.59 CMD 12-H13.59A
University of Ontario Institute of Technology, represented by M. Owen, G. Bereznai	CMD 12-H13.60
Provincial Council of Women of Ontario, represented by G. Janes	CMD 12-H13.61
Citizens for a Safe Environment and The Committee for Safe Sewage, represented by K. Buck and D. Done	CMD 12-H13.62
Chaitanya Kalevar	CMD 12-H13.63
Raymond Leistner	CMD 12-H13.64
Jo Hayward-Haines	CMD 12-H13.65
Eclipsall Energy Corporation, represented by D. Archer	CMD 12-H13.66
Lake Ontario Waterkeeper, represented by J.Bull; E. Rotenberg	CMD 12-H13.67
Andrei Neacsu	CMD 12-H13.68
Jen Mooney	CMD 12-H13.69
Mary McGillis	CMD 12-H13.70
Rabeya Alam	CMD 12-H13.71
Paul Courey	CMD 12-H13.72
Karen Kwok	CMD 12-H13.73
Erika Tran	CMD 12-H13.74
Port Hope and District Chamber of Commerce	CMD 12-H13.75

Don Chisholm	CMD 12-H13.76
Community Living Oshawa-Clarington	CMD 12-H13.77
Norm and Donna Boychuk	CMD 12-H13.78
Power Workers' Union, represented by B. Walker	CMD 12-H13.79 CMD 12-H13.79A
Canadian Nuclear Workers Council, represented by D. Shier, J. Usher and C. Leavitt	CMD 12-H13.80 CMD 12-H13.80A
Women in Nuclear-Canada, represented by C. Cottrill and J. Donegan	CMD 12-H13.81
Deborah Cherry	CMD 12-H13.82 CMD 12-H13.82A
Organization of CANDU Industries, represented by R. Oberth	CMD 12-H13.83 CMD 12-H13.83A
Robert C. Azzopardi	CMD 12-H13.84
Bhavnita Shah	CMD 12-H13.85
Candu Energy, represented by F. Yee and B. Pilkington	CMD 12-H13.86
Mark Reid	CMD 12-H13.87
The Regional Municipality of Durham, represented by G. Cubitt	CMD 12-H13.88
Ontario Ministry of Labour, represented by W. Ng	CMD 12-H13.89
Durham College	CMD 12-H13.90
Jenny Carter	CMD 12-H13.91
Braven R. Corby	CMD 12-H13.92
Michelle Bode-Simeunovich	CMD 12-H13.93
Robin Penney	CMD 12-H13.94
Peter Tabuns, MPP, Toronto-Danforth	CMD 12-H13.95
Rotary Club of Courtice	CMD 12-H13.96
Rick Maltese	CMD 12-H13.97
Don Weitz	CMD 12-H13.98
Marc Green	CMD 12-H13.99
St. Marys Cement (Canada)	CMD 12-H13.100
Rhea Baluyut	CMD 12-H13.101 CMD 12-H13.101A
Jennifer Deguire	CMD 12-H13.102
John O'Toole, MPP, Durham	CMD 12-H13.103
Marina Moudrak	CMD 12-H13.104 CMD 12-H13.104A
Ontario Clean Air Alliance	CMD 12-H13.105
Michael O'Morrow	CMD 12-H13.106
Kimberly L. Townley-Smith	CMD 12-H13.107
Fred Twilley	CMD 12-H13.108 CMD 12-H13.108A
FullCircle Energy Solutions Inc., represented by C. Young	CMD 12-H13.109 CMD 12-H13.109A
Families Against Radiation Exposure, represented by D. Kelly	CMD 12-H13.110
Hamish Wilson	CMD 12-H13.111

Paul Gasztold	CMD 12-H13.112
Jurgen Schmutz	CMD 12-H13.113
Harold Fassnacht	CMD 12-H13.114
Kelly Carmichael	CMD 12-H13.115
Alison J. Petten	CMD 12-H13.116
Robert Hunter	CMD 12-H13.117
Glen and Margaret Woolner	CMD 12-H13.118
Debra Reed	CMD 12-H13.119
Canadian Unitarians for Social Justice	CMD 12-H13.120
Genevieve Delmas Patterson	CMD 12-H13.121
Environmental Coalition of Prince Edward Island	CMD 12-H13.122
Greater Oshawa Chamber of Commerce	CMD 12-H13.123
Blake Reid	CMD 12-H13.124
Eva Torn Thomas	CMD 12-H13.125
Sheila-Marie Richardson	CMD 12-H13.126
Louisette Lanteigne	CMD 12-H13.127
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