Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

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ORIGINAL/ORIGINAL

CMD: 23-H9

Date signed/Signé le : 27 OCTOBER 2022

A Licence Renewal

Ontario Power Generation Inc.

Darlington Waste Management Facility

Application to Renew the Class IB Waste Facility Operating licence for Ontario Power Generation in Darlington, Ontario

Commission Public Hearing

Scheduled for:

January 25-26, 2023

Submitted by:

CNSC Staff

Renouvellement d’un permis

Ontario Power Generation Inc.

Installation de gestion des déchets de Darlington

Demande de renouvellement du permis d’installation de déchets de catégorie IB pour Ontario Power Generation à Darlington (Ontario)

Audience publique de la Commission

Prévue pour :

janvier 25-26, 2023

Soumis par :

Le personnel de la CCSN

e-Doc 6811210 (WORD)
e-Doc 6895999 (PDF)

Summary

This Commission Member Document (CMD) presents information about the following matters of regulatory interest with respect to Ontario Power Generation, herein known as OPG to:

- Renew the Class IB waste facility operating licence WFOL-W4-255.00/2033 to operate the Darlington Waste Management Facility (DWMF) for a period of 10 years.

CNSC staff recommend the Commission take the following actions:

- Renew the waste facility operating licence to authorize OPG to operate the facility until April 30, 2033.
- Authorize the delegation of authority as set out in section 5.6 of this CMD.

The following items are attached:

- The proposed Waste Facility operating Licence (WFOL) WFOL-W4-355.00/2033
- Draft Licence Conditions Handbook (LCH).
- The current Waste Facility Operating Licence WFOL-W4-355.00/2023.

Résumé

Le présent CMD fournit de l'information sur les questions d'ordre réglementaire suivantes concernant Ontario Power Generation, ci-après appelée OPG:

- Renouveler le permis d'exploitation de l'installation de déchets de catégorie IB WFOL-W4-255.00/2033 pour opérer l'installation de gestion des déchets de Darlington pour une période de 10 ans.

La Commission pourrait considérer prendre les mesures suivantes :

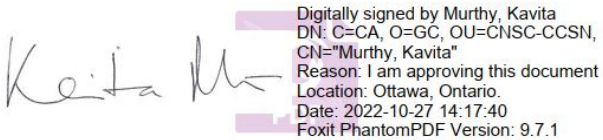
- Renouveler le permis d'exploitation de l'installation de gestion des déchets de Darlington jusqu'au 30 avril 2033.
- Déléguer les pouvoirs tel qu'il est établi à la section 5.6 du présent CMD.

Les pièces suivantes sont jointes :

- Le permis d'exploitation d'une installation de déchets proposé (WFOL) WFOL-W4-355.00/2033
- Le Manuel des conditions de permis (MCP) associé.
- Le permis d'exploitation actuel de l'installation de déchets, WFOL-W4-355.00/2023.

Signed/Signé le

27 October 2022



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EXECUTIVE SUMMARY

Ontario Power Generation (OPG) Inc. is the owner and licensed operator of the Class 1B Darlington Waste Management Facility (DWMF). This facility is located in the Municipality of Clarington, which is within the traditional territory of the Wendat, Anishinabek Nation, and the territory covered by the Williams Treaties with the Michi Saagiig and Chippewa Nations.

The facility provides for the safe processing and storage of used fuel generated by reactor operation at the Darlington Nuclear Generating Station, and storage of intermediate-level radioactive waste from the Darlington Refurbishment Project.

Pursuant to section 24 of the *Nuclear Safety and Control Act* (NSCA), the Commission issued an operating licence to OPG in 2013 for 10 years. It will expire on April 30, 2023.

On December 16, 2021, OPG submitted an application to renew the operating licence for a 10-year period. OPG is also requesting to carry over, into the new licence term, the future construction of 2 additional storage structures for used fuel dry storage containers.

In 2021, OPG renamed its Nuclear Waste Management division to Nuclear Sustainability Services. As a result, the title of the Darlington Waste Management Facility will be replaced with the title Nuclear Sustainability Services – Darlington. OPG is requesting the title change be reflected in the licence.

The purpose of this CMD is to outline the results of CNSC staff's assessment of the licence application and supporting documentation, including recommendations and conclusions, to inform the Commission's decision on OPG's request to renew is operating licence.

The public, Indigenous nations and communities, and stakeholders were invited to participate in the relicensing process. The CNSC Participant Funding Program provided up to $75,000 in funding to enable participation.

This CMD has 2 parts. Part 1 presents CNSC staff's assessment of OPG's licence application, past performance in all safety and control areas and future safety improvement commitments. CNSC staff conclude that OPG has met regulatory requirements and that its regulatory performance throughout the licensing period was satisfactory.

CNSC staff recommend the Commission take the following actions:

1. Conclude that pursuant to paragraphs 24(4)(a) and (b) of the *Nuclear Safety and Control Act* (NSCA) in that the licensee:
    i. Is qualified to carry on the activity that the licence will authorize the licensee to carry on; and
    ii. Will, in carrying on that activity, 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.

2. Renew the proposed 10-year waste facility operating licence until April 30, 2033, with the updated Licence Condition 15, and
3. Delegate the authority to CNSC staff as set out in section 5.6 of this CMD.

Part 2 of this CMD provides licensing-related documentation pertaining to this hearing, including proposed licence changes, the proposed licence and the current licence. A draft licence conditions handbook is also included for information purposes only.

Referenced documents in this CMD are available to the public upon request, subject to confidentiality considerations.

PART ONE

This CMD is presented in two parts.

Part One includes:

1. an overview of the matter being presented;
2. overall conclusions and overall recommendations;
3. general discussion pertaining to the safety and control areas (SCAs) that are relevant to this submission;
4. discussion about other matters of regulatory interest; and
5. addenda material that complements items 1 through 4.

Part Two provides all available information pertaining directly to the current and proposed licence.

1. OVERVIEW

1.1 Background

Ontario Power Generation (OPG) is the owner and operator of the Darlington Nuclear Waste Management Facility (DWMF) under a Class IB nuclear facility licence, WFOL-W4-355.01/2023.

At the DWMF, OPG receives, processes and stores dry storage containers (DSCs) containing used nuclear fuel (high-level radioactive waste) generated at the Darlington Nuclear Generating Station (DNGS). Intermediate level radioactive waste generated from the refurbishment of the DNGS is also stored.

DWMF Location and Layout

DWMF is located on the site of the DNGS on the north shore of Lake Ontario in the Municipality of Clarington, which is located within the traditional territory of the Wendat, Anishinabek Nation, and the territory covered by the Williams Treaties with the Michi Saagiig and Chippewa Nations.

The DWMF consists of the:

- DSC Processing building
- Used Fuel Dry Storage Building #1 (UFDSB#1)
- Used Fuel Dry Storage Building #2 (UFDSB#2)
- Retube Waste Storage Building (RWSB) for the storage of intermediate level waste from the Darlington Refurbishment Project.

An aerial image of the DWMF buildings is provided in figure 1.

The waste facility operating licence currently authorizes OPG to construct two additional UFDSBs, which would allow for an additional storage capacity of 1,000 DSCs. The Figure 1 aerial image of the DWMF buildings also includes the proposed locations for UFDSB #3 and #4.

With the exception of the RWSB, the DWMF is contained within its own protected area, which is separate from the protected area of the DNGS but within the boundary of the Darlington site. The RWSB is also located within the boundary of the Darlington site but not within a protected area.

Figure 1: Darlington Waste Management Facility (DWMF)
Source: Ontario Power Generation

DWMF Licensing History

In 2007, OPG received a waste facility operating licence for the DWMF, which consisted of UFDSB#1. The first DSC transfer with used fuel from DNGS was received in 2008.

In 2013, following a public hearing held on December 3-6, 2012, the Commission renewed the DWMF waste facility operating licence for a 10-year period, valid from March 13, 2013 to April 30, 2023. This authorization included the site preparation and construction for three additional UFDSBs and one RWSB. Licence conditions were placed in the licence to verify that the additional UFDSBs and RWSB met regulatory requirements and remained within the licensing basis prior to construction and operation.

On March 30, 2016, the Commission amended the DWMF operating licence to remove the licence condition on Environmental Assessment Follow-up Programs, because the condition had been fulfilled; modify the operational performance

reporting transmittal period to align the reporting timeline with all other OPG Class I nuclear facilities; and update the format of the licence to align with the CNSC standardized licence conditions.

On November 10, 2016 [5], CNSC staff authorized OPG to operate UFDSB#2 after construction and commissioning activities were completed by OPG in accordance with the licence.

On November 21, 2017 [7], CNSC staff authorized OPG to operate the RWSB after construction and commissioning activities were completed by OPG in accordance with the licence.

DWMF Operations

DNGS used nuclear fuel is transferred in DSCs to the DWMF DSC Processing Building. The DSCs are then processed which includes welding and painting of the DSC. OPG targets to process around 60 DSCs per year.

The processed DSCs are then transferred and stored in UFDSB #1 and #2. The UFDSB's have a current nominal capacity of 1000 DSCs, which is sufficient to store DSCs until approximately 2026.

The RWSB is designed to provide interim storage for irradiated reactor components from the Darlington Refurbishment Project. The RWSB is an above ground concrete warehouse type building that has reinforced concrete floors and overlapping concrete wall panels. Retube waste is stored at the RWSB in Retube Waste Container (RWC) with Darlington Storage Overpack (DSO). The RWSB has a nominal capacity of 490 containers, which is sufficient for storage of the retube waste from all four Darlington units.

1.2 Highlights

DWMF's Licence Renewal Application Requests

On December 16, 2021, OPG submitted an application for the renewal of its Class 1B Waste Facility Operating Licence for the DWMF [1]. In its renewal application, OPG is requesting:

1. A ten-year licence term to operate the waste management facility, in order to continue operations beyond April 30, 2023.
2. The title of the DWMF in the licence be replaced with the title Nuclear Sustainability Services –Darlington.
3. Change the name of the DSC's storage buildings from UFDSB to Used Fuel Dry Storage Structures (UFDSS). This change will be reflected in the new licence.

4. Carry-over into the new licence term, the future construction of two additional storage structures for used fuel DSCs. The storage structures #3 and #4 will have a larger total capacity (an increase from 1,000 DSCs to 1,200 DSCs) and will have a modified design.

Beside the name change, there are no changes requested to the activities authorized by the CNSC licence.

Name Change of the Facility

In 2021, OPG renamed its Nuclear Waste Management division to Nuclear Sustainability Services. Therefore, OPG has requested that the title Darlington Waste Management Facility be changed to Nuclear Sustainability Services-Darlington in section IV of the licence.

CNSC staff accept the licensee's chosen name for the facility and wish to stress that the name of a facility has no impact on regulatory activities. Regulatory effort is driven by the licensed activities carried out at the facility, and in this case, OPG does not propose to alter the licensed activities.

Further details on CNSC staff's assessment are provided in section 5.7 of this CMD.

Name Change of Used Fuel Dry Storage Buildings to Storage Structures

In the licence application, OPG has requested that the name of the two future DSC storage buildings be changed from UFDSBs to UFDSSs. This change is reflected in section IV) **LICENSED ACTIVITIES** of the proposed licence (see attachment of this CMD).

CNSC staff agree that the change to the name UFDSS for the two future storage structures is an acceptable term. Further details on CNSC staff's assessment are provided in section 5.8 of this CMD.

Additional Used Fuel Dry Storage Structures

In its licence application, OPG requested a change to the storage capacity and design for the future UFDSS#3 and #4.

OPG is currently authorized to construct two additional UFDSB with a storage capacity of 500 DSCs each, for a total increase of 1000 DSCs. In its application, OPG stated that current plans included the construction of two additional UFDSS for a total increase of 1200 DSCs. OPG's application stated that based on the annual processing rates and with consideration of the Darlington Refurbishment Project, the construction of UFDSS #3 and #4 with a capacity to store 1,200 DSCs, will enable adequate DSC storage capacity until 2043.

Furthermore, OPG stated in its application that UFDSS#3 and #4 will incorporate changes to the design of the structures. For example, the revised design may be a non-shielded structure on a concrete slab capable of supporting the distributed weight of the DSCs.

CNSC staff have assessed OPG's request for changes in the design. CNSC staff propose to retain the existing licence condition 15.2 and modify licence condition 15.1 to include the submission of a preliminary safety analysis report and require formal acceptance from the Commission or a person authorized by the Commission.

Further details on CNSC staff's assessment are provided in section 5.9 of this CMD.

CNSC Staff Assessment of DWMF's Licence Application

This CMD provides the results of CNSC staff's assessment of OPG's application, including conclusions and recommendations, to inform the Commission's decision on the licence application to renew the operating licence for the DWMF.

This CMD includes information on CNSC staff review of all safety and control areas (SCAs) with focused highlights on:

1. Programs and processes that constitute the licensing basis
2. Performance assessments in all safety and control areas (SCAs) during the current licensing period
3. Engagement with the public and Indigenous Nations and communities

1.3 Overall Conclusions

CNSC staff assessment determined that OPG's application meets regulatory requirements and establishes an adequate licensing basis for continued operation. CNSC staff's assessment is documented in Addendum B.2 of this CMD.

On an ongoing basis CNSC staff have reviewed OPG's performance over the previous licence period and reported results to the Commission in public meetings through the annual Regulatory Oversight Reports. CNSC staff's assessments of performance and compliance are based on desktop reviews of OPG's submissions, including quarterly and annual compliance reports and event reviews, and the results of CNSC inspections. CNSC staff have determined that OPG's performance during the licensing term was satisfactory and consistently met regulatory requirements.

Based on CNSC staff's assessments of OPG's past performance at the facility and of the licence application, CNSC staff determined that OPG remains qualified of performing the activities authorized by the licence.

1.4 Overall Recommendations

CNSC staff recommend the following:

1. Conclude, pursuant to paragraphs 24(4)(a) and (b) of the *Nuclear Safety and Control Act* in that the licensee:

   a) Is qualified to carry on the activity that the licence will authorize the licensee to carry on; and

   b) Will, in carrying on that activity, 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.

2. Renew the proposed 10-year waste facility operating licence until April 30, 2033, with the updated Licence Condition 15, and

3. Delegate the authority to CNSC staff as set out in section 5.6 of this CMD.

2. ENVIRONMENTAL PROTECTION REVIEW

2.1 Environmental Protection Review

CNSC staff reviewed the licence application to determine which type of environmental review was required to be conducted, if applicable. CNSC staff determined that the Impact Assessment Act (IAA) does not apply because the proposed activities are not captured in the IAA's Physical Activities Regulations nor are they considered a project on federal lands.

CNSC staff conduct environmental protection reviews (EPRs) for all licence applications with potential environmental interactions, in accordance with CNSC's mandate under the NSCA and its associated Regulations. The EPRs informs the Commission's decision on whether the proposal provides adequate protection of the environment and the health of people.

An EPR report is available for the facility. CNSC staff's assessment included a review of the licence application and supporting documents, including the environmental risk assessment, annual compliance monitoring reports, preliminary decommissioning plan, and past environmental performance. The EPR report, which contains the results of this assessment, including a summary of past environmental assessments for the facility, is available here on the CNSC website.

CNSC staff's assessment found that the potential risks from radiological and hazardous releases to the atmospheric, aquatic, terrestrial, and human environments from DWMF are negligible. Furthermore, human health is not impacted by operations at DWMF and is indistinguishable from health outcomes found in the general public. CNSC staff have also found that OPG continues to implement and maintain effective environmental protection measures to adequately protect the environment and health of persons.

CNSC staff will continue to verify and ensure that, through ongoing licensing and compliance activities and reviews, the environment and the health of persons are protected and will continue to be protected over the proposed licence period.

2.2 Other Matters of Regulatory Interest

The following table identifies other matters that are relevant to this CMD.

OTHER MATTERS OF REGULATORY INTEREST	
Area	**Relevant to this CMD?**
Cost Recovery	Yes
Financial Guarantees	Yes
Improvement Plans and Significant Future Activities	No
Licensee Public Information Program	Yes
Nuclear Liability Insurance	Yes

The relevant "other matters" of regulatory interest are discussed in section 5.

2.3 Regulatory and Technical Basis

The regulatory and technical bases for the matters discussed in this CMD are provided in Addendum B1 to this document.

For a waste management facility, the key requirements come directly from the NSCA and its Regulations. The actual citations are placed into Addendum B3.

3. GENERAL ASSESSMENT OF SCAS

The specific areas that comprise the SCAs for this facility or activity type are identified in section C.2. If specific areas are not listed for a given SCA in section 3, then a decision has been made to encompass them in an overall approach to that SCA.

3.1 Management System

The management system SCA covers the framework that establishes the processes and programs required to ensure an organization achieves its safety objectives, continuously monitors its performance against these objectives, and fosters a healthy safety culture.

This CMD covers the following specific areas of the Management System SCA:

- Management System
- Performance Assessment, Improvement and Management Review
- Change Management
- Records Management
- Problem Identification and Operating Experience
- Safety Culture
- Business Continuity

3.1.1 Trends

The following table indicates the overall rating trends for the Management System over the current licensing period:

TRENDS FOR MANAGEMENT SYSTEM								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments								
OPG has implemented a management system that meets the requirements of (CSA) standard N286-12, *Management System Requirements for Nuclear Facilities*. Over the licence period, CNSC staff have verified that OPG has maintained its management system at DWMF through compliance verification activities. DWMF received a "satisfactory" (SA) rating for this SCA throughout the licence period.								

3.1.2 Discussion

Management System

CNSC staff confirmed that OPG has implemented and continues to maintain its nuclear management system, Charter N-CHAR-AS-0002, which applies to DWMF and complies with the requirements of Canadian Standards Association (CSA) standard N286-12, *Management System Requirements for Nuclear Facilities*.

The program W-PROG-WM-0001, *Nuclear Waste Management* describes the organizational responsibilities, interfaces, and key elements for the management of radioactive wastes and prescribes controls and responsibilities to ensure waste management activities are carried out in a safe and effective manner by qualified personnel.

Performance Assessment, Improvements and Management Review

During CNSC Type II inspections, CNSC staff verify that OPG conducts assessments and program review as per OPG governance documents. OPG's audit frequency of the waste management program was every two years up to December 2020 and then was changed to every three years. The audit frequency is based on risk and varies from 1 to 5 years. The methodology that was used to develop the plan for the 2019-2023 coverage cycle is documented in OPG's documentation. CNSC staff agree with the new frequency. CNSC staff confirm that OPG conducted internal assessments on the effectiveness of the waste management program. OPG conducted audits in July 2018 and in October 2020. The next audit is planned in 2023.

Change Management

OPG has processes in place for the control of changes to the organization, documentation and Structure, Systems and Components (SSC). Changes to the organizational structure and the roles and responsibilities of the persons responsible for the management and control of the licensed activities are reported to the CNSC through OPG's submission of Person's Authorized letters throughout the year. OPG's quarterly reports submitted to CNSC include changes to the licensed documents and SSC.

In 2021, OPG reported a change to the organization within OPG responsible of the program W-PROG-WM-0001, *Nuclear Waste Management.* The ownership of this program was transferred from the nuclear organization to an interfacing one, but the Chief Nuclear Officer is still accountable for the effectiveness of the waste program.

Over the current licence period, OPG updated the program W-PROG-WM-0001, *Nuclear Waste Management* in accordance with the 3-year review cycle period for OPG programs and implementing documents. CNSC staff reviewed the changes to this program and licensing documents and verified compliance with the regulatory requirements.

Records Management

The specific area (SpA) Records Management includes the control and management of documents. OPG provides records and documents that support its licensed activities to CNSC staff on request and in accordance with the LCH and REGDOC 3.1.2 *Reporting Requirements, volume 1: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*. CNSC staff review the control of documents and records during the CNSC inspections.

Problem Identification and Operating Experience

OPG has licensed processes for documenting and addressing problems and for sharing the information. In accordance with the REGDOC 3.1.2, *Reporting Requirements, volume 1: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*, OPG submits reports on specified types of events to the CNSC. From 2013 to 2021, thirty-three events were reported. CNSC staff reviewed those event reports and ensured that corrective actions were taken and that causes were addressed, and that lessons learned were shared by OPG internally and externally if applicable.

Safety Culture

OPG's governance clearly identifies the importance of nuclear safety and states that "*nuclear safety shall be the overriding priority in all activities*" (N-POL-001, *Nuclear Safety Policy*). The framework, guiding principles, and accountabilities for nuclear safety oversight are governed by N-STD-AS-0023, *Nuclear Safety Oversight* which summarizes the licensee's internal and external processes used for oversight and assessment. OPG governance requires nuclear safety culture self-assessments to be conducted at the facility at least every five years. Safety culture self-assessments include multiple measures of employees' perceptions, attitudes, and behaviors gathered through surveys, documentation reviews, focus groups and observations, and interviews.

OPG has set up a Nuclear Safety Culture Monitoring Panel for the three OPG waste management facilities (DWMF, Pickering Waste Management Facility and Western Waste Management Facility), to monitor safety culture trends in a timely and ongoing basis between major self-assessments. The panel is composed of managers from these three facilities. The panel meets regularly, gathers information from a variety of sources, and integrates this information to identify trends and areas for attention regarding safety culture. Numerous sources provide information about the health of the safety culture at a facility including the following: station condition records, self-assessment and benchmarking activities, operating experience, employee concerns, and industry assessments.

OPG's most recent safety culture self-assessment was completed in 2018. The assessment included written surveys, interviews and field observations. As per OPG's Nuclear Safety Culture Assessment procedure, the facility's nuclear safety culture commenced in 2022 and will be finalized in 2023.

During the current licence period, the CNSC published REGDOC-2.1.2, *Safety Culture*. At the request of CNSC staff, OPG performed a gap analysis and confirmed completed implementation in 2019.

CNSC staff will monitor OPG's performance in this area through the conduct of regular compliance verification activities.

Business Continuity

The facility has contingency plans in place to maintain or restore critical safety and business functions in the event of disabling circumstances. N-REP-08115.21-10053, *Business Impact Analysis for Nuclear Waste Management* provides a list of business /operating risks; a list of key processes, key staff and vital records, along with their corresponding criticality category (which is equivalent to their recovery priority) and the response strategies for the critical categories processes affected by risks, the business impact analysis also includes key suppliers and key locations. In 2021, OPG continued taking the necessary steps to mitigate the impact of COVID-19.

3.1.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.1.3.1 Past Performance

During the past ten years, the facility has maintained W-PROG-WM-0001, *Nuclear Waste Management* and this program was monitored by the OPG Nuclear Oversight group, which is an independent entity within OPG.

CSNC staff conducted a Type II inspection at the facility in May 2017, which was focused on the management system SCA. CNSC staff raised two action notices and a directive for non-compliance findings. CNSC staff were satisfied with OPG's corrective actions to address the non-compliance findings and all enforcement actions associated with this inspection were closed in November 2019. The next inspection focused management system inspection is scheduled for end of 2022.

On the basis of CNSC staff's oversight over the licence period, CNSC staff concludes that OPG's performance over the past ten years in the Management System SCA was satisfactory.

3.1.3.2 Regulatory Focus

CNSC staff will continue to verify that the facility's management system meets the requirements of the CSA Standard N286-12, through the performance of desktop reviews and inspections.

3.1.3.3 Proposed Improvements

OPG has tools in place for seeking opportunities to improve its program W-PROG-WM-0001, *Nuclear Waste Management* in conducting self and independent assessments and in implementing preventive actions.

3.1.4 Conclusion

Based on CNSC staff assessments of OPG's licence application, supporting documentation and past performance, CNSC staff conclude that the implementation of OPG's management system at this facility continues to meet regulatory requirements.

3.1.5 Recommendation

Two licence conditions are included in both the current and proposed licence for this SCA. Licence condition 1.1 requires OPG to implement and maintain a management system. Licence condition 1.2 requires OPG to ensure that every contractor working at the facility complies with this licence. Compliance verification criteria for these licence conditions are included in the draft LCH in part 2 of this CMD.

3.2 Human Performance Management

The SCA human performance management covers activities that enable effective human performance through the development and implementation of processes that ensure a sufficient number of licensee personnel are in all relevant job areas and have the necessary knowledge, skills, procedures and tools in place to safely carry out their duties.

This CMD covers the following specific areas of the Human Performance Management SCA:

- Human Performance Program
- Personnel Training
- Fitness for Duty

3.2.1 Trends

The following table indicates the overall rating trends for the Human Performance Management over the current licensing period:

TRENDS FOR HUMAN PERFORMANCE MANAGEMENT								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments								
OPG has implemented a human performance management program in accordance with regulatory requirements. Over this licence period, CNSC staff have verified that OPG has maintained its human performance program through compliance verification activities. DWMF received a SA rating for this SCA throughout the licence period.								

3.2.2 Discussion

Paragraphs 12(1)(*a*) and (*b*) of the *General Nuclear Safety and Control Regulations* (GNSCR) require that a licensee shall ensure the presence of a sufficient number of qualified workers to carry on the licensed activity safely and in accordance with the NSCA, the regulations made under the NSCA and the licence; and shall train the workers to carry on the licensed activity in accordance with the NSCA, the regulations made under the NSCA and the licence.

Paragraphs 6(*m*) and 6(*n*) of the *Class I Nuclear Facilities Regulations* (CINFR) require that licence applications include the proposed responsibilities of workers, and qualification requirements and training program for workers, including the procedures for the requalification of workers; and the results that have been achieved in implementing the program for recruiting, training and qualifying workers in respect of the operation and maintenance of the nuclear facility.

Paragraph 14(2)(e) of the CINFR requires every licensee to keep a record of the status of each worker's qualifications, requalification and training, including the results of all tests and examinations completed in accordance with the licence.

OPG is also required to implement and maintain training programs for workers at DWMF in accordance with the requirements set out in REGDOC-2.2.2 *Personnel Training*.

Human Performance Program

OPG's program document N-PROG-AS-0002, *Human Performance* establishes a framework for the various elements of the management of human performance across OPG, including this facility. Numerous supporting documents provide the means by which human performance is integrated within day-to-day operations and is addressed as a core business activity. The program provides guidance to reduce the probability and consequences of human error associated with the human-system interface required to operate, maintain, and support a nuclear facility.

The goal of OPG's human performance program is to continually reduce the frequency and severity of events through the systematic reduction of human error and the management of defences in pursuit of zero events of consequence. OPG's program focuses on a proactive approach to the identification of error precursors, flawed defences, and latent organizational weaknesses. Human performance initiatives in the areas of procedural use and adherence; pre-job briefing and post job debriefing; observation and coaching; conservative decision making; self-checking; and, situational awareness, all support workers in the safe completion of work tasks. When conditions are identified which do not support safe worker performance, or events occur, investigations are conducted by OPG through established event analysis techniques and actions are taken to correct any deficiencies.

OPG revised its Human Performance program documentation to incorporate enhancements, and to reflect organizational changes as well as changes to other governance. CNSC staff reviewed and are satisfied with OPG's revision.

Personnel Training

OPG has a well-documented and robust training system as described in its program document N-PROG-TR-0005, *Training* and its associated procedural document N-PROC-TR-0008, *Systematic Approach to Training* (SAT).

During routine compliance inspections over the current licence period, CNSC staff verified that OPG developed, implemented, and continually improved the SAT-based training system for workers at this facility. CNSC staff further verified that OPG's training program complies with the requirements of CNSC regulatory document REGDOC-2.2.2, *Personnel Training*.

CNSC staff concluded that OPG continued to implement its Human Performance Program in accordance with regulatory requirements.

Fitness for Duty

CNSC staff confirmed that OPG has in place, measures to address fitness for duty requirements. OPG implements corporate level programs on various fitness for duty aspects, such as N-PROC-OP-0047, *Hours of Work Limits and Managing Worker Fatigue,* to manage worker fatigue that include limits on hours of work. CNSC REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue* specifies requirements and guidance for managing worker fatigue and has been implemented at the facility.

REGDOC-2.2.4, *Fitness for Duty, Volume II: Managing Alcohol and Drug Use*, Version 3 sets out requirements and guidance for managing fitness for duty of workers occupying safety-sensitive and safety-critical positions in relation to alcohol and drug use. OPG provided implementation plans early in 2018, which were accepted by CNSC staff. In late 2018, OPG requested an amendment to include oral fluid testing to supplement the urinalysis testing required by the regulatory document. CNSC staff reviewed, and the Commission accepted the request and began work in 2019 to revise REGDOC-2.2.4 Volume II. The amendment was presented to the Commission on November 5, 2020 and approved for publication and use.

The new version (version 3) was published on January 22, 2021. OPG confirmed that they had implemented version 3 as planned by July 2021 at the facility, with the exception of random testing, which they committed to implement by January 22, 2022. On January 21, 2022, the Federal Court granted an injunction putting on hold the implementation of pre-placement and random alcohol and drug testing pending the decision of the Federal Court's judicial review scheduled for late 2022.

3.2.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.2.3.1 Past Performance

Regulatory oversight activities conducted by CNSC staff during the licence term included two onsite training-focused inspections, and desktop reviews of quarterly compliance reports and revisions to OPG's relevant program documentation for this SCA.

CNSC staff conducted onsite training-focused inspections in 2015 and 2016 covering the specific area of personnel training. CNSC staff found three non-compliances and OPG implemented corrective actions to address all of the identified non-compliances by 2017. CNSC staff confirm that all enforcement actions have been closed.

In 2018, CNSC staff conducted a general inspection of OPG's Human Performance Program, OPG-DWMF-2018-01 [2] and observed that the facility workers were well organized and understood how to carry out their tasks safely.

As a result of the activities described above, CNSC staff conclude that OPG's performance for this area meets regulatory requirements.

3.2.3.2 Regulatory Focus

CNSC staff will continue to monitor OPG's performance in the Human Performance Management SCA through regulatory oversight activities including inspections, desktop reviews of quarterly and annual compliance reports, and desktop reviews of revisions to relevant program documentation pertaining to this SCA.

3.2.3.3 Proposed Improvements

OPG has implemented REGDOC 2.2.4 *Fitness for Duty Volume II: Managing Alcohol and Drug Use,* with the exception of pre-placement and random alcohol drug testing. OPG has committed to providing further details on the implementation of the remaining portions of REGDOC 2.2.4 Vol II.

3.2.4 Conclusion

Based on CNSC staff assessments of OPG's licence application, supporting documentation and past performance, CNSC staff conclude that OPG continues to implement and maintain a human performance and training program in accordance with regulatory requirements.

3.2.5 Recommendation

Two licence conditions are included in both the current and proposed licence for this SCA. Licence condition 2.1 requires OPG to implement and maintain a human performance program. Licence condition 2.2 requires OPG to implement and maintain a training program. Compliance verification criteria for these licence conditions are included in the draft LCH in part 2 of this CMD.

3.3 Operating Performance

The operating performance SCA includes an overall review of the conduct of licensed activities and the activities that enable effective operating performance.

The specific areas that comprise this SCA at the facility include:

- Conduct of licensed activity
- Procedures
- Reporting and trending

3.3.1 Trends

The following table indicates the overall rating trends for the Operating Performance over the current licensing period:

TRENDS FOR OPERATING PERFORMANCE								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
FS	FS	FS	FS	FS	SA*	SA	SA	SA
Comments								
OPG has implemented and maintained an operating program in accordance with CNSC requirements during this licence period. This facility received a SA rating for this SCA throughout the licence period.								

*The change in rating from 2017 to 2018 was due to CNSC staff's refinement of its Criteria for "fully satisfactory" ratings and not due to a decline in performance.

3.3.2 Discussion

OPG is required by its licence to implement and maintain an operating program, which includes a set of operating limits, and to maintain a program for reporting to the Commission or an authorized person. CNSC staff verify that OPG has policies, programs, methods and procedures in place for the safe operation and maintenance of its licensed nuclear facility. The occupational and industrial safety aspects of the facility's operations are regulated under the *Occupational Health and Safety Act of Ontario* and the *Labour Relations Act*. REGDOC-3.1.2, Reporting Requirements, Volume I: Non-Power Reactor Class I Facilities and Uranium Mines and Mills, is also applicable providing requirements for reporting on Operating performance.

Verification of the licensee's compliance with the requirements of this SCA are included as part of CNSC's compliance activities ranging from desktop reviews of annual reports, reviews of event reports, related corrective actions and inspections. CNSC staff confirmed through these compliance verification activities that OPG has implemented and maintained an effective operating program in order to ensure licensed activities are conducted safely and in compliance with regulatory requirements.

The operating limits and conditions for the WMF facility are contained in the safety report [8].

OPG provides a summary of compliance against these operating limits and conditions as part of their annual reports to the CNSC. CNSC staff reviewed this information and confirmed that the facility has operated within the operating limits and conditions for the facility.

Conduct of Licensed Activity

Used Fuel Dry Storage Buildings

At the beginning of the licence period, the facility consisted of UFDSB #1 that contained 227 DSCs.

In 2014, OPG submitted a construction notification [3] for UFDSB #2 which included an Environmental Management Plan, a Construction Verification Plan, Project Design Requirements, and a list of proposed changes to the safety report. CNSC staff reviewed the documents and confirmed that the design and location of the new building remained within the safety and design basis of the facility. As required by the licence, after construction and commissioning of the UFDSB#2, OPG submitted a commissioning report [4] in 2016. CNSC staff assessed the commissioning report and concluded that OPG had provided adequate information for CNSC staff to authorize building operations [5]. The Director General, Directorate of Nuclear Cycle and Facilities Regulation, the delegate authority as authorized by the Commission in licence condition 15.2, accepted the commissioning report, and authorized operations to begin at UFDSB#2. The UFDSB#2 facility started operations in 2016.

UFDSB#1 and UFDSB#2 are single-story concrete structures that can each store 500 DSCs. The DSC is a freestanding reinforced concrete container, with an inner carbon-steel liner and an outer carbon-steel shell, with the space between the inner and outer shells filled with high-density concrete as shown in figure 2. Each DSC contains 384 used fuel bundles.

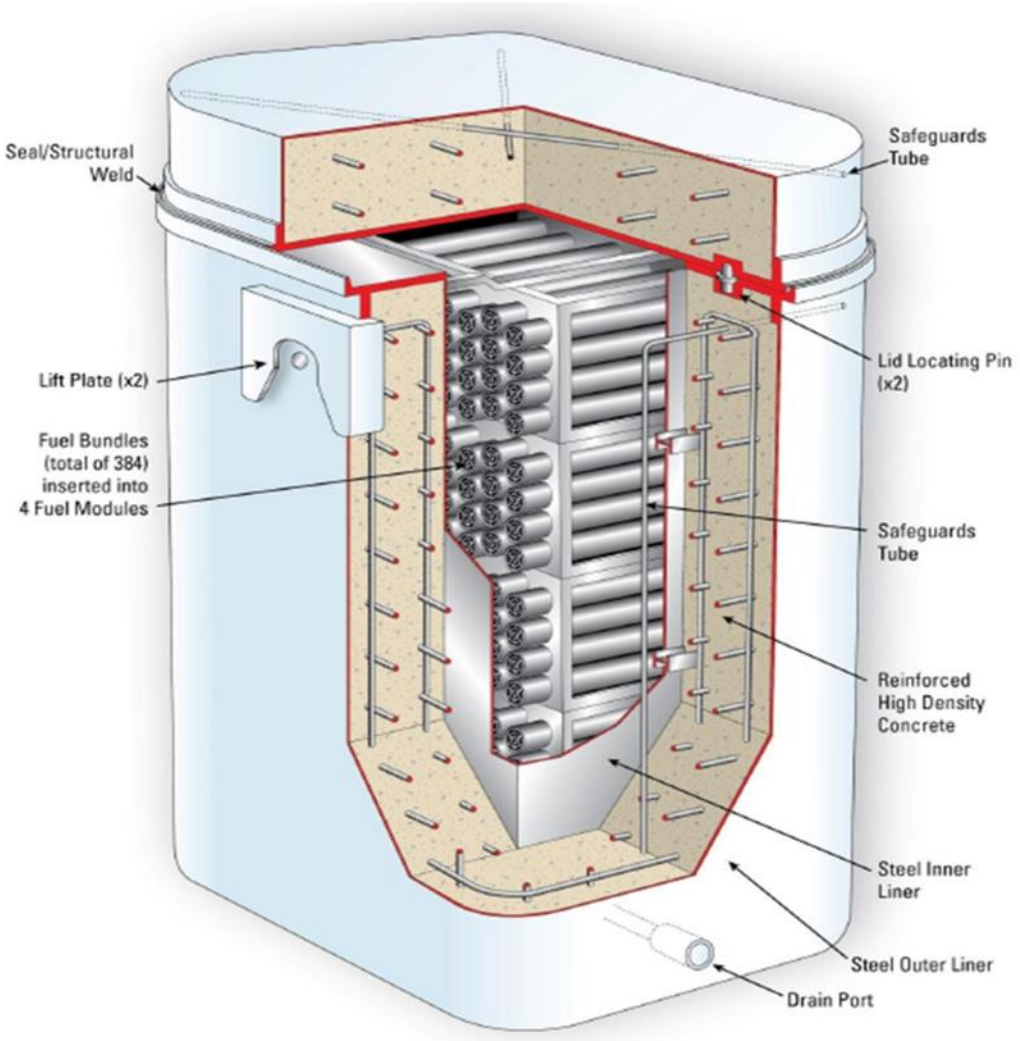

Figure 2: Dry Storage Container
Source: Ontario Power Generation

The following table outlines the total number of DSCs placed into storage during the licence period.

Table 1: Number of DSCs Received at the waste facility during licensing period

Year	Number of DSCs
2013	60
2014	60
2015	63
2016	65
2017	63
2018	57
2019	59
2020	59
2021	58
2022[1]	9
Total	**553**

At the end of 2021, there were 408 DSCs in storage at UFDSB#1 and 372 DSCs in storage at UFDSB#2, totaling 780 DSCs in storage at the facility.

Retube Waste Storage Building

In 2014, OPG submitted to CNSC staff a construction notification [6] for the RWSB, which included an Environmental Management Plan, a Construction Verification Plan and the Project Design Requirements. In 2015, CNSC staff reviewed the documents and confirmed that the design and location of the new building remained within the safety and design basis of the facility. Before operation of the building be authorized, OPG submitted eight commissioning reports for the various components of RWSB. CNSC staff assessed the commissioning reports and concluded that OPG had provided adequate information for CNSC staff to authorize building operations [7]. The Director, Waste and Decommissioning Division, the delegated authority as authorized by the Commission in licence condition 15.2, accepted the commissioning reports in 2017 and authorized operations to begin at the RWSB. Operation commenced in 2017.

RWSB stores intermediate level waste (ILW) waste in Retube Waste Containers (RWCs) with Darlington Storage Overpacks (DSOs) as shown in figure 3.

[1] For the period of January 1 - March 31, 2022.

Figure 3: Darlington Storage Overpack with Retube Waste Container inside
Source: Ontario Power Generation

The following table outlines the number of RWC/DSOs placed into storage at the RWSB since its start of operations in 2017 to 2021.

Table 2: Number of RWC/DSOs Placed into storage at RWSB from 2017 to 2021

Year	RWC/DSOs
2017	29
2018	64
2019	0
2020	0
2021	92
2022[2]	0
Total	**185**

[2] For the period of January 1 - March 31, 2022.

Procedures

OPG has a process in place to ensure that procedures are developed and changes to them are managed consistently to support the safe operations and maintenance of the facility.

CNSC staff review procedural-level documents as part of ongoing compliance verification activities to ensure proper maintenance of procedures to reflect actual practices as well as procedural adherence by OPG personnel. The current (and proposed) LCH identifies licensing basis program documentation and stipulates requirements for providing change notification, which triggers reviews by CNSC staff to ensure changes continue to align with regulatory requirements and the facility licensing basis.

CNSC staff was satisfied with the quality of the OPG procedures and found that they met the applicable regulatory requirements.

Reporting and Trending

OPG's documents N-PROG-RA-0002, Conduct *of Regulatory Affairs* and N-PROC-RA-0020, *Preliminary Event Notification* ensure that events are reported in accordance with regulatory requirements. CNSC staff have reviewed these documents and consider them acceptable.

In February 2018, CNSC staff requested OPG to submit an implementation plan for REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Facilities and Uranium Mines and Mills*. OPG completed the implementation of REGDOC-3.1.2 in February 2019. CNSC staff concluded that OPG is currently meeting the requirements of REGDOC-3.1.2.

There were a total of 33 reportable events during the current licensing period. Table 4 provides a breakdown of the events reported during the current licence period.

Table 3: Number of reportable events by year from 2013 - 2022

Year	Number of Events Reported	Applicable SCA
2013	2	Security, Emergency Management and Fire Protection
2014	2	Security
2015	6	Emergency Management and Fire Protection (5), Fitness for Service (1)
2016	5	Security (1), Emergency Management and Fire Protection (4)
2017	2	Emergency Management and Fire Protection
2018	5	Safeguards and Non-proliferation (2), Security (3)

Year	Number of Events Reported	Applicable SCA
2019	4	Safeguards and Non-proliferation (2), Emergency Management and Fire Protection (1), Physical Design (1)
2020	3	Safeguards and Non-proliferation (1), Emergency Management and Fire Protection (1), Fitness for Service (1)
2021	3	Radiation Protection (2), Safeguards and Non-proliferation (1)
2022[3]	1	Emergency Management and Fire Protection

For all reportable events, CNSC staff confirm that OPG followed up with corrective actions and root cause analyses, when appropriate. CNSC staff note that there were no adverse effects on the health and safety of persons or the environment as a result of these reportable events. CNSC staff are satisfied with OPG's actions with respect to reportable events and all events are considered closed. For the current licensing period, none of the events reported by OPG were significant enough to warrant reporting to the Commission as an Event Initial Report, but all were reported to the Commission through CNSC staff's annual Regulatory Oversight Reports.

As per licence condition 3.2, OPG is required to submit quarterly and annual reports summarizing its operations. CNSC staff conclude that OPG submitted satisfactory quarterly and annual reports during the licence period as required.

3.3.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.3.3.1 Past Performance

CNSC staff have assessed the Operating Performance SCA for this facility. During the current licensing period, OPG met the regulatory requirements for the Operating Performance SCA.

Over the current licensing period, CNSC staff have conducted 22 Type II inspections at the facility. For a comprehensive list of the inspections, refer to Addendum D.

[3] For the period of January 1 - March 31, 2022.

Non-compliances identified during inspections were addressed by OPG in a timely manner and in accordance with corrective action plans that were reviewed and accepted by CNSC staff. The safety significance of the non-compliances were low. The notices of non-compliances are all closed with the exception of one issued during the 2022 Radiation Protection inspection. OPG is currently addressing that non-compliance.

3.3.3.2 Regulatory Focus

CNSC staff will continue to monitor OPG's performance in this SCA through regulatory oversight activities including inspections and desktop reviews of relevant program documentation. CNSC staff will focus on procedural adherence and maintenance of the operating limits and safety envelope with compliance verification focus on the safe conduct of licensed activities.

3.3.3.3 Proposed Improvements

OPG is planning the following proposed improvements with respect to operating performance for the next licensing period:

- Development and procurement of a next generation DSC welding machine, to assist with efficiencies and overcome obsolescence challenges of the current machines. This welding machine is anticipated to be available in 2024.
- Procurement of two new DSC Transporters has been initiated, which will ensure continued reliability for transportation of DSCs between DNGS and the facility.
- Actions are underway to look for efficiencies to reduce the number of RWC/DSOs needed per unit for the Darlington Refurbishment Project. It is estimated that a reduction of approximately five (5) RWC/DSOs per unit may be possible.

3.3.4 Conclusion

Based on CNSC staff assessments of OPG's application, supporting documents and past performance, CNSC staff conclude that OPG continues to implement and maintain an effective operating program in accordance with regulatory requirements.

3.3.5 Recommendation

Two licence conditions are included in both the current and proposed licence for this SCA. Licence condition 3.1 requires the licensee to implement and maintain an operating program, which includes a set of operating limits. Licence condition 3.2 requires the licensee to implement and maintain a program for reporting to the Commission or a person authorized by the Commission. Compliance verification criteria for both licence conditions are included in the draft LCH.

3.4 Safety Analysis

The Safety Analysis SCA covers the maintenance of the safety analysis that supports the overall safety case for the facility. 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 preventative measures and strategies in reducing the effects of such hazards.

The specific areas that comprise this SCA at the facility are:

- Deterministic safety analysis
- Hazard analysis

The specific areas are addressed all together in section 3.4.2

3.4.1 Trends

The following table indicates the overall rating trends for the Safety Analysis over the current licensing period:

TRENDS FOR SAFETY ANALYSIS								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
FS	FS	FS	FS	FS	SA*	SA	SA	SA
Comments								
OPG's safety analysis report (SAR) effectively identifies facility hazards and SSCs relied upon for safety to control or mitigate these hazards. This facility received a SA rating or above for this SCA throughout the licence period.								

*The change in rating from 2017 to 2018 was due to CNSC staff's refinement of its Criteria for "fully satisfactory" ratings and not due to a decline in performance.

3.4.2 Discussion

Paragraph 3 (1) (i) of the GNSCR requires that a description and the results of any test, analysis or calculation performed to substantiate the information included in the application. Paragraph 5(f) of the CINFR requires that an application to construct a Class I nuclear facility include a preliminary SAR. Paragraph 6(a) of the CINFR requires that an application for a licence to operate include a description of the structures at the nuclear facility, including their design and their design operating conditions. Paragraph 6(b) of the CINFR requires that an application for a licence to operate include a description of the systems and equipment at the nuclear facility, including their design and their design operating conditions. Paragraph 6(c) requires that an application for a licence to operate include a final SAR. The safety analysis report is to confirm that the consequences of a range of events are acceptable. It includes an integrated assessment of the facility to demonstrate, among other things, adequate safety for external events such as fires, floods, and tornados, and adequate protective features to ensure the effects of an event do not impair safety related SSCs.

The OPG licence renewal application's supporting documentation included the SAR for the facility. The SAR [8] provides a description of the facility and building layouts, processes, operating limits, and scenarios based on hazards and postulated initiating events. In addition, the SAR provides an assessment of potential consequences and demonstrate the safety case through defence in depth.

CNSC staff evaluated the information provided in the SAR for this facility and determined that the licensee has adequately assessed the hazards associated with licensed activities and demonstrated an adequate level of protection over a broad range of operating conditions. This SCA is usually verified only through document review, and criteria incorporated in other inspections e.g., physical design.

The CNSC requires, in the facility LCH, that OPG reviews, revises as necessary, and submits its SAR at a minimum of once every 5 years. The previous safety report was updated in 2016 (Revision 003). In November 2021, OPG submitted Revision 004 of the document.

CNSC staff conclude based on its review of the submitted application and supporting documents that the radiological and non-radiological risks associated with OPG's operations at the facility are low. OPG remains in compliance with regulatory requirements for the Safety Analysis SCA.

3.4.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.4.3.1 Past Performance

OPG has performed several safety assessments to ensure the safety of its operations as part of the continued improvement of safety analysis.

Hazard analysis and selection of credible accident conditions has been performed using probabilistic approaches. Demonstration of safety in credible scenarios was performed using deterministic approaches. Both – probabilistic and deterministic – approaches were established and maintained by OPG in a consistent manner during the past licensing periods.

3.4.3.2 Regulatory Focus

CNSC staff continue to monitor OPG's performance in this area through regulatory oversight activities including on-site inspections and desktop reviews of OPG compliance reporting and revisions to relevant program documentation pertaining to this SCA.

Furthermore, CNSC staff activities over the next licence period for UFDSS#3 and #4 will include the following:

- Technical Assessment of the preliminary safety analysis, project design requirements and construction verification plan
- Technical Assessment of the commissioning reports

3.4.3.3 Proposed Improvements

REGDOC-2.4.4, *Safety Analysis for Class IB Nuclear Facilities* was approved by the Commission in June 2022. A formal gap analysis of the safety analysis program and safety analysis is expected with respect to requirements for conduct of safety analysis, periodic reviews, clear regulatory expectations on SAR documentation and application of the graded approach.

3.4.4 Conclusion

OPG has a process in place to identify and evaluate potential safety hazards associated with the operation of the facility. Based on CNSC staff assessments of OPG's application, supporting documents and past performance, CNSC staff conclude that OPG continues to implement and maintain an effective safety analysis program in accordance with regulatory requirements.

3.4.5 Recommendation

The current and proposed licence condition 4.1 requires OPG to implement and maintain a safety analysis program. Compliance verification criteria for this licence condition are included in the draft LCH.

3.5 Physical Design

The SCA physical design relates to activities that impact the ability of structures, systems and components to meet and maintain their design basis given new information arising over time and taking changes in the external environment into account.

The specific areas that comprise this SCA at the facility include:

- Design governance
- Facility design
- Structure design
- System design
- Component design

3.5.1 Trends

The following table indicates the overall rating trends for the Physical Design over the current licensing period:

TRENDS FOR PHYSICAL DESIGN								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments								
OPG has implemented a Design Program and a Pressure Boundary Program that meets regulatory requirements. Over the licence period, CNSC staff have verified that OPG has maintained its Program through compliance verification activities. This facility received a SA rating for this SCA throughout the licence period.								

3.5.2 Discussion

The licensee is required to implement and maintain a design program and a pressure boundary Program such that the design of facilities and any subsequent changes remain within the licensing basis.

Design Governance

Management of the design basis is governed by the OPG standard, N-STD-MP-0028. The conduct of engineering program is supported by the design management program, the engineering change control program, the configuration management program and the pressure boundary program.

Over the current licensing period, OPG has maintained an effective design program, implementing design modifications to the facility in accordance with established engineering control process to maintain the design basis and licensing basis.

Facility, Structure, System and Component Design

A description of the facility's various systems and components is documented in the SAR. The SAR also outlines general design aspects such as safety objectives of the facility design, design principles, defence in depth, and measures to ensure conformance with design criteria (e.g., design and change control processes and third-party reviews).

Over the licensing period, two major changes to the facility design requiring CNSC staff authorization were proposed:

- The construction and commissioning of UFDSB#2
- The construction and commissioning of RWSB

On March 14, 2014, OPG submitted a construction verification plan and project design requirements for the construction of UFDSB#2. CNSC staff assessed the documents and concluded that the design and location of the new building remained within the commission-approved safety case and design basis of the facility. On March 2016, OPG submitted the commissioning report for UFDSB#2. In November 2016, CNSC staff authorized the operation of UFDSB#2 after confirming that the commissioning results indicated that the installation met the functional, performance and safety requirements of the UFDSB#2 design and regulatory requirements.

On November 7, 2014, OPG submitted a construction verification plan and project design requirements for the RWSB. CNSC staff assessed the documents and concluded that the design and location of the new buildings remained within the commission-approved safety case and design basis of the facility. In August 2017, OPG submitted the commissioning reports for the RWSB. In November 2017, CNSC staff authorized the operation of RWSB after confirming that the commissioning results indicated that the installation met the functional, performance and safety requirements of the RWSB design and regulatory requirements.

OPG maintains a Fire Hazard Assessment (FHA) and updates the assessment periodically to reflect changes and modifications in the facility. In 2019, OPG submitted an FHA to demonstrate compliance with the requirements of CSA N393-13 and best industry practices. The objective of the FHA is to identify the current fire hazards, evaluate the impact of fires involving these hazards on the facility, and assess the adequacy of the fire protection measures in place to mitigate these hazards. The FHA concluded that that the performance goals, objectives and criteria of CSA N393-13 have been satisfied for this facility. CNSC reviewed OPG's FHA and found it acceptable and meet regulatory requirements.

OPG conducted a Code Compliance Review (CCR) of the facility in May 2016. The objective of the CCR is to confirm the state of compliance of the facility with the requirements of applicable fire and life safety codes and standards. OPG's CCR concluded that the waste management facility is in compliance with the requirements of CSA N393-13, *Fire Protection for facilities that process, store and handle nuclear substances*. CNSC staff reviewed OPG's CCR and found that it meets regulatory requirements and is therefore acceptable.

OPG has a pressure boundary program, N-MAN-01913.11-10000, that complies with the requirements of CSA N285.0 (2008 and Updates No.1 and No. 2), General Requirements for pressure-retaining systems and components in CANDU nuclear power plants, B51 (2009 and Update No. 1), Boiler, pressure vessel and pressure piping code as well as various other standards. OPG has a formal service agreement with the Technical Standards and Safety Authority as the Authorized Inspection Agency (AIA). CNSC staff verified that OPG continues to implement a comprehensive pressure boundary program and maintains a formal agreement with an AIA.

3.5.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.5.3.1 Past Performance

CNSC staff found that OPG has implemented and maintains an effective design program and a comprehensive pressure boundary program that meets regulatory requirements. CNSC staff rated OPG's overall performance for the Physical Design SCA as satisfactory during the current licence period. Regulatory oversight activities conducted by CNSC staff included desktop reviews of quarterly compliance reports and of revisions to OPG's relevant program documentation for this SCA.

3.5.3.2 Regulatory Focus

CNSC staff continue to monitor OPG's performance in this SCA through regulatory oversight activities including onsite inspections and desktop reviews of relevant program documentation.

Furthermore, CNSC staff activities over the next licence period for the UFDSS#3 and #4 will include the following:

- Technical Assessment of the preliminary safety analysis, project design requirements and construction verification plan
- Technical Assessment of the commissioning reports

3.5.3.3 Proposed Improvements

The *National Fire Code of Canada* (NFCC) 2020 and the *National Building Code of Canada* (NBCC) 2020 were published in March 2022 and will apply to this facility's operations. CSA N393:22 *Fire protection for facilities that process, handle, or store nuclear substances*, published in September 2022 will also apply. CNSC staff have requested that OPG develop an implementation plan to align the fire protection program with the requirements set in the 2020 published version of the NFCC, the 2022 version of N393 and to ensure that the new storage structures and modifications to the existing buildings meet the requirements set in the 2020 published version of the NBCC.

3.5.4 Conclusion

Based on CNSC staff assessments of OPG's application, supporting documents and past performance, CNSC staff conclude that OPG continues to implement and maintain a physical design program in accordance with regulatory requirements.

3.5.5 Recommendation

Two licence conditions are included in both the current and proposed licence for this SCA. Licence condition 5.1 requires the licensee to implement and maintain a design program. Licence condition 5.2 requires the licensee to implement and maintain a pressure boundary program and have in place a formal agreement with an Authorized Inspection Agency. Compliance verification criteria for both licence conditions are included in the draft LCH.

3.6 Fitness for Service

The SCA fitness for service covers activities that impact the physical condition of structures, systems and components to ensure that they remain effective over time. This area includes an integrated set of programs that ensure all equipment is available to perform its intended design function when called upon to do so. The specific areas that comprise this SCA at the facility include:

- Equipment fitness for service
- Maintenance
- Structural integrity
- Aging Management
- Chemistry control
- Periodic inspection and testing

The specific areas are addressed together in section 3.6.2.

3.6.1 Trends

The following table indicates the overall rating trends for the Fitness for Service over the current licensing period:

TRENDS FOR FITNESS FOR SERVICE								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments								
OPG has implemented a Fitness for Service program that meets regulatory requirements. Over the licence period, CNSC staff have verified that OPG has maintained its Fitness for Service Program through compliance verification activities. The facility received a SA rating for this SCA throughout the licence period.								

3.6.2 Discussion

Paragraph 6(d) of the CINFR requires that an application to operate a Class I nuclear facility contain the proposed measures, policies, methods, and procedures for operating and maintaining the nuclear facility. Further requirements under this SCA are provided under the NBCC and the NFCC. Specific aspects of CSA N286-12 and CSA N393-13 are also applicable for this SCA.

System and component performance monitoring is carried out in accordance with OPG's equipment reliability program, N-PROG-MA-0026, to trend system performance and initiate investigations or maintenance activities, including monitoring of:

- process parameters;
- maintenance backlogs;
- station condition records; and,
- inspection results.

The nuclear waste management program governs preventative maintenance activities, and OPG's enterprise management software "Asset Suite" is used for scheduling and tracking preventative and corrective maintenance tasks.

OPG has processes in place to assess and monitor the physical condition of DSCs, and civil structures including the inspection of DSC seal welds after fuel loading, inspecting loaded DSCs for aging related degradation, and the inspection of storage facilities. OPG has implemented an integrated Aging Management program, N-PROG-MP-0008. Specific aging management plans have been implemented to address plausible aging mechanisms for DSCs, and an inspection program has been developed for the welding bay walls. As part of their Aging Management strategy, OPG performed an Ageing Management inspection at the facility in 2021, in which 157 DSCs were inspected with a focus on life limiting components. Subsequently, OPG submitted the DSC aging management inspection report for CNSC staff review in May 2022. Based on submitted information, CNSC staff has not identified any concerns regarding the performance or structural integrity of DSC components.

OPG's fire protection systems are tested according to an established schedule in accordance with the NBCC and the NFCC.

CNSC staff verified that OPG's fitness for service programs complies with the requirements of REGDOC-2.6.3, *Aging Management*.

3.6.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.6.3.1 Past Performance

CNSC staff found that OPG has implemented and maintains an effective fitness for service programs that meets regulatory requirements. CNSC staff rated OPG's overall performance for the Fitness for Service SCA as satisfactory during the current licence period.

CNSC staff reviewed quarterly and annual reports regarding maintenance and chemistry control. No concerns were raised, and there were no events related to maintenance and chemistry control.

DSC aging management activities have been carried out in accordance with the licensee's program and there has been no degradation of DSCs that impact safe storage of used fuel. Generally, observed degradation has been characterized as minor damage to painted surfaces and minor surface corrosion that is easily repaired by repainting surfaces, when required.

Flaws have been occasionally detected in the lid to base seal welds after filling DSCs, but the findings are dispositioned appropriately to ensure the flaws do not impact safe storage of the used fuel and the findings are reported to CNSC staff. When applicable, the licensee has investigated means to update welding equipment and improve welding practices. CNSC staff has confirmed that the licensee has the necessary processes in place to track and monitor DSCs with seal weld flaws.

In 2014, a focused Fitness for Service inspection was conducted. One recommendation was identified. In 2016, a general type II compliance inspection with an emphasis on aging management and periodic inspection reports was conducted. Two action notices were identified for fitness for service and were considered of low safety significance. OPG has implemented appropriate corrective actions to the satisfaction of CNSC staff, and therefore all enforcement actions have been closed.

3.6.3.2 Regulatory Focus

CNSC staff continue to monitor the licensee's performance in this SCA through regulatory oversight activities including inspections and desktop reviews of relevant program documentation.

Furthermore, CNSC staff activities over the next licence period for the UFDSS#3 and #4 will include the following:

- Technical Assessment of the preliminary safety analysis, project design requirements and construction verification plan
- Technical Assessment of the commissioning reports

3.6.3.3 Proposed Improvements

OPG has planned the following proposed improvements to address aging and obsolescence and to ensure ongoing Fitness for Service of critical SSCs through the next licence period:

- LiftKing transporter LT1024 was refurbished and commissioned in June 2022. The DSC transporter is expected to be in service until December 2051.
- Periodic roof replacement will be undertaken at the facility starting with the DSC Processing Building and UFDSB #1.
- All six air conditioning units are scheduled to be replaced in 2023.
- New generation welding machines are expected to be commissioned starting 2024.

- A new project has been initiated to replace of the current Phased Array Ultrasonic Testing system by 2025.

3.6.4 Conclusion

Based on CNSC staff assessments of OPG's application, supporting documents and past performance, CNSC staff conclude that OPG continues to implement and maintain effective fitness for service programs in accordance with regulatory requirements and appropriate processes are in place to ensure maintenance programs are updated if/when necessary.

3.6.5 Recommendation

The current and proposed licence condition 6.1 requires OPG to implement and maintain a fitness for service programs. Compliance verification criteria for this licence condition are included in the draft LCH.

3.7 Radiation Protection

The radiation protection SCA covers the implementation of a radiation protection program in accordance with the *Radiation Protection Regulations*. The program must ensure that contamination levels and radiation doses received by individuals are monitored, controlled, and maintained as low as reasonably achievable (ALARA).

The specific areas that comprise this SCA at the facility include:

- Application of ALARA
- Worker dose control
- Radiation protection program performance
- Radiological hazard control

3.7.1 Trends

The following table indicates the overall rating trends for the Radiation Protection over the current licensing period:

TRENDS FOR RADIATION PROTECTION								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments								
OPG has implemented and maintained an effective radiation protection program, as required by the *Radiation Protection Regulations*. Over the current licensing period, no worker received a radiation dose in excess of regulatory dose limits as a result of the licensed activities conducted at the Waste Management Facility. OPG continues to perform satisfactorily in this SCA. Overall, CNSC staff conclude that OPG's performance in the radiation protection program meets regulatory requirements.								

3.7.2 Discussion

The *Radiation Protection Regulations* require licensees to implement a radiation protection (RP) program. As part of that program, licensees must keep effective and equivalent doses received by, and committed to, persons ALARA, taking into account social and economic factors. This is achieved through the implementation of management control over work practices, personnel qualification and training, control of occupational and public exposures to radiation, and planning for unusual situations. The *Radiation Protection Regulations* also prescribe dose limits for Nuclear Energy Workers (NEWs) and persons who are not NEWs.

CNSC staff confirmed that OPG has implemented and continues to maintain an RP program that ensures contamination levels and radiation doses received by individuals are monitored, controlled, and maintained ALARA. CNSC staff conducted general compliance verification inspections regularly as well as an RP focused Type II inspection in 2022. Details of CNSC staff's assessment of the Radiation Protection SCA are presented in the following sub-sections.

Application of ALARA

During an RP focused Type II inspection and during desktop reviews, CNSC staff confirmed that OPG develops annual and quarterly ALARA dose targets for this facility. The target values are based on the planned processing of DSCs for the year and include all key work activities associated with transporting used fuel from the irradiated fuel bays to final sealing in the processing building and then storage at the waste facility. The target values are also informed by historical trends collected from the start of the facility's operation in 2008. OPG's ALARA dose targets and performance against those targets are reported to CNSC staff on a quarterly basis. CNSC staff's review of these submissions confirmed that OPG is committed to ensuring that doses to workers are maintained ALARA in all areas of operations at this facility.

Radiological work activities performed is predominantly a repetitive process involving key work activities mentioned in the previous paragraph. Accordingly, OPG has been able to define the radiological hazards and establish procedures that manage personnel exposures to levels that are ALARA. In addition, OPG staff periodically monitor and track various ALARA performance metrics that have challenging monthly and yearly target values.

Table 4 illustrates the collective doses for the facility from 2013-2021. Annual collective dose is mainly determined by the number of DSCs loaded in the year, and due to the repetitive nature of well-described radiological work the variation between years is small.

Table 4: Annual collective dose for DWMF, 2013-2021 (person-mSv)

ANNUAL COLLECTIVE DOSES TO WORKERS									
Dose Statistic	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Collective Dose[1]	12.9	15.0	8.8	5.1	6.9	4.7	6.5	5.2	6.4
Total Persons Monitored[1,2]	44	44	40	35	37	42	42	42	39
DSCs loaded[1]	60	60	63	65	63	57	59	59	58

1. As reported by OPG to CNSC staff in Quarterly Operations Reports

2. As reported by OPG to CNSC staff for the CNSC's annual Regulatory Oversight Reports

As part of the CNSC staff's regulatory oversight, a Type II inspection focusing on radiation protection was conducted for this facility in 2022. While CNSC staff verified that OPG used ALARA initiatives, work planning, and dose monitoring and control to achieve ALARA targets, there was one finding related to the Application of ALARA. CNSC staff issued a notice of non-compliance (NNC) with program requirements regarding performance monitoring of collective dose against target values at the facility. The safety significance of this NNC was considered to be low, and an enforcement item was raised for OPG to formalize their process for approving ALARA collective dose targets and to maintain records that demonstrate performance monitoring. OPG is currently addressing this finding. CNSC staff will assess the adequacy of OPG's corrective actions and monitor the implementation through ongoing compliance verification activities.

CNSC staff are satisfied with OPG's efforts in applying the ALARA principle to keep doses to workers ALARA over the current licensing period. CNSC staff conclude that OPG meets regulatory requirements in this specific area.

Worker dose control

OPG has designated all workers at the facility as Nuclear Energy Workers (NEWs).

Table 5 lists the non-zero average effective doses and the maximum individual effective doses received by a NEW at the facility from 2013 to 2021. This data shows that the annual non-zero average effective doses ranged from 0.3 mSv to 0.5 mSv, and the maximum individual effective dose ranged from 0.6 mSv to 1.7 mSv. The largest maximum individual annual effective dose (1.7 mSv) during this period was received in 2014 and 2015.

Table 5: Average and maximum effective doses for the waste facility workers, 2013-2021 (mSv)

AVERAGE AND MAXIMUM EFFECTIVE DOSES TO WORKERS										
Dose Statistic	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**Regulatory Limit**
Total Persons Monitored[1]	44	44	40	35	37	42	42	42	39	N/A
Average Effective Dose[1,2] (mSv)	0.5	0.5	0.5	0.4	0.5	0.3	0.3	0.3	0.3	
Maximum Individual Effective Dose[1,2] (mSv)	1.6	1.7	1.7	0.7	1.1	0.7	0.8	0.8	0.6	50 mSv/year

1. As reported by OPG to CNSC staff for the CNSC's annual Regulatory Oversight Reports
2. Arithmetic average dose values are based on the non-zero results only

As mentioned in the previous sub-section, radiological work activities performed are predominantly a repetitive process, which has enabled OPG to establish consistent performance with respect to worker dose control.

CNSC staff's review of the worker dose information over the current licensing period found that no worker received a radiation dose in excess of the dose limits defined in the *Radiation Protection Regulations*.

As the facility resides within the Darlington Nuclear site, it is possible for non-NEWs to pass near to the facility, approaching as close as the perimeter fence that surrounds the DSC processing building and UFDSB #1 and #2, and as close as the exterior wall of the Retube Waste Processing Building. To assess the dose received by non-NEWs, OPG installed Thermoluminescent Dosimeters (TLD) at 12 locations along the facility's perimeter fence and at 10 locations around the Retube Waste Storage Building. These TLDs record exposures on a quarterly basis and OPG uses the results to calculate potential dose rates to confirm they do not exceed an upper-bound value of 0.5 µGy/h. This target value is conservatively based on an annual occupancy of 2,000 hrs at any one of the perimeter locations by a non-NEW who has a 1 mSv/y regulatory dose limit. These dose rate results are reported to CNSC staff quarterly.

A review of OPG's "perimeter TLD" monitoring data indicates that the highest estimated radiation dose rates along the facility perimeter fence and the RWSB exterior walls, for the period 2016 to 2021, were approximately 0.15 µGy/h and 0.10 µGy/h, respectively (note that the RWSB was commissioned in November 2017 and commenced receipt of waste containers in 2018). OPG reported the dose rates in Gy because that is the unit used to monitor dose in air. Sv refers to dose in tissue. Arguably, the dose recorded by the TLD is associated with gamma radiation, which has a 1:1 conversion from Gy:Sv.

OPG's estimated dose rates are well below the target value and are indicative that non-NEW doses received from being in close proximity to the facility should remain well below the regulatory dose limit of 1 mSv/year. From 2016-2021, no measurable dose was assigned to a non-NEW at this facility.

Table 6 provides the equivalent dose to the skin for NEWs, during the period 2013-2021. The maximum annual equivalent dose to the skin received during this period was 2.09 mSv (approximately 0.4% of the annual 500 mSv regulatory dose limit), which was incurred by a DSC Transporter driver who had a personal contamination event in July 2020.

Table 6: Equivalent dose to the skin for the waste facility workers, 2013-2021 (mSv)

EQUIVALENT DOSE TO SKIN FOR WORKERS										
Dose Statistic	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**Regulatory Limit**
Maximum Skin Dose* (mSv)	1.6	1.7	1.7	0.7	1.1	0.7	0.8	2.09	0.6	500 mSv/y

1. As reported by OPG to CNSC staff for the CNSC's annual Regulatory Oversight Reports

There have been no action level exceedances during the current licensing period at the facility.

CNSC staff are satisfied with OPG's efforts during the current licensing period to control the effective and equivalent doses to workers at the facility. CNSC staff conclude that OPG meets regulatory requirements in this specific area.

Radiation protection program performance

Radiation protection program performance was assessed during the current licensing period through various CNSC staff compliance verification activities, including technical assessments of quarterly operations reports. In addition, in 2022, CNSC staff conducted Type-II inspection focused on radiation protection.

CNSC staff's review of the quarterly reports submitted by OPG for this facility during the current licensing period found that the reported information met the regulatory requirements specified in REGDOC-3.1.2, and no adverse trends were noted.

The CNSC staff Type-II inspection conducted in 2022 identified two findings being non-compliant.

Both non-compliant findings identified during the Type-II inspection were associated with the performance of self assessments. In the first finding, CNSC staff found that OPG was non-compliant with their program requirements to conduct a focused self-assessment prior to the inspection. In the second finding, CNSC staff found that OPG was not performing self-assessments to determine the adequacy of the implementation of the radiation protection program within the facility. Self-assessments are a key component of OPG's management system and are essential to driving improvement in the radiation protection program. Because self-assessments do not directly affect worker doses or contamination control, CNSC staff considered these two findings to be of low safety significance. Notwithstanding, NNC were raised for OPG to ensure self-assessments are conducted per procedure requirements. OPG has addressed these findings.

CNSC staff are satisfied with the performance of OPG's radiation protection program at the facility over the current licensing period. CNSC staff conclude that OPG meets regulatory requirements in this specific area.

Radiological hazard control

When possible, OPG eliminates radiation hazards within the facility. OPG employs various measures to monitor and control all remaining radiological hazards. An overriding administrative measure is the use of radiation zone control. This measure is complimented by surface and airborne contamination monitoring, as well as by radiological dose rate surveys. Signage is used to identify the locations and magnitude of hazards that exist within the facility. If practicable, temporary shielding is erected to reduce the magnitude of radiation fields in the facility. Strategic placement of DSCs that emit lower radiation fields are employed as a means of shielding DSCs that emit higher fields. OPG makes use of temporary contamination control areas when performing radiological work, and access to radiologically controlled areas is limited to authorized personnel. Radiologically controlled areas are posted with the required radiation warning signage, routine monitoring for contamination is performed, and monitoring of personnel and material prior to leaving contaminated or potentially contaminated areas is mandatory.

There have been no radiation protection action level exceedances during the period 2013-2021 at the facility.

During the Type-II inspection conducted in 2022, CNSC staff identified one non-compliant finding related to radiological hazard control. That finding resulted in a NNC to OPG for being non-compliant with their procedures concerning the retention of manufacturer's certificates for the radiation sources used to calibrate radiation protection monitors (whole body monitors, and small article monitors). Radiation protection monitors are essential for verifying that workers and their belongings have not been contaminated with radioactive material, and that loose contamination is not migrating outside of contamination control areas. Consequently, CNSC staff expect there to be verifiable records associated with the sources used to ensure these monitors function properly. Because there was no evidence that the radiation monitors were improperly calibrated or not functioning properly, CNSC staff consider this finding to be of low safety significance. Enforcement items were raised for OPG to obtain and retain the certificates for the licensed sources used at the facility. OPG is currently addressing this finding.

CNSC staff will assess the adequacy of OPG's corrective actions and monitor the implementation through ongoing compliance verification activities.

CNSC staff are satisfied with OPG's efforts to monitor and control the radiological hazards over the current licensing period. CNSC staff conclude that OPG meets regulatory requirements in this specific area.

3.7.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.7.3.1 Past Performance

CNSC staff have assessed OPG's program under the Radiation Protection SCA. During the current licensing period, OPG met the regulatory requirements for the Radiation Protection SCA.

3.7.3.2 Regulatory Focus

CNSC staff will continue to verify OPG's performance and compliance in all aspects of the Radiation Protection SCA, including maintaining RP instruments and equipment, mitigating and controlling contamination, and verifying that the protection of workers is optimized and that worker doses are kept ALARA.

Furthermore, CNSC staff activities over the next licence period for the new storage structures will include the following:

- Technical Assessment of the preliminary safety analysis, project design requirements and construction verification plan
- Technical Assessment of the commissioning reports

3.7.3.3 Proposed Improvements

OPG is not planning any substantive changes to its radiation protection program for the next licensing period.

Based on the effective implementation of the current program, this is acceptable to CNSC staff.

3.7.4 Conclusion

Based on CNSC staff assessments of OPG's application, supporting documents and past performance, CNSC staff conclude that OPG continues to implement and maintain an effective radiation protection program in accordance with regulatory requirements that maintains worker doses ALARA, prevents dose from exceeding regulatory limits and ensures adequate contamination control.

3.7.5 Recommendation

The current and proposed licence condition 7.1 requires OPG to implement and maintain a radiation protection program, which includes a set of action levels. Compliance verification criteria for this licence condition are included in the draft LCH.

3.8 Conventional Health and Safety

The conventional health and safety SCA covers the implementation of a program to manage workplace safety hazards and to protect workers.

The specific areas that comprise this SCA at the facility include:

- Performance
- Practices
- Awareness

3.8.1 Trends

The following table indicates the overall rating trends for the Conventional Health and Safety over the current licensing period:

TRENDS FOR CONVENTIONAL HEALTH AND SAFETY								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
FS	FS	FS	FS	FS	SA*	SA	SA	SA
Comments								
OPG has implemented a conventional health and safety program that meets regulatory requirements. Over the licence period, CNSC staff have verified that OPG has maintained its conventional health and safety program through compliance verification activities. The facility received a SA or above rating for this SCA throughout the licence period. OPG has continued to demonstrate its ability to keep the workers safe from occupational injuries.								

*The change in rating from 2017 to 2018 was due to CNSC staff's refinement of its Criteria for "fully satisfactory" ratings and not due to a decline in performance.

3.8.2 Discussion

The Conventional health and safety program at OPG falls under the dual regulatory oversight of the CNSC and the Ontario Ministry of Labour. OPG submits event reports to both regulators, in accordance with their respective reporting requirements. CNSC staff monitor compliance with regulatory reporting requirements through various means including desktop reviews and inspections.

OPG is obligated under its licence to implement and maintain a conventional health and safety program. The facility's activities must comply with the Occupational Health and Safety Act of Ontario and the Labour Relations Act. OPG's occupational health and safety program applies to all work performed by OPG employees and contractors. Paragraph 12(1)(c) of the GNSCR also requires OPG to take all reasonable precautions to protect the health and safety of persons.

The risks from conventional hazards at the facility are mainly associated with the control and safe handling of hazardous materials and heavy equipment. The hazardous materials are typical of industrial facilities and include compressed gases for welding and emission monitors. Other hazardous substances include maintenance consumables such as welding rods, abrasives and lubricants, adhesives and paints, and janitorial and cleaning supplies.

During most inspections, CNSC inspectors verify OPG's conventional health and safety program at the facility, to observe workers' compliance with requirements related to workplace safety, proper use of personal protective equipment, use of signage and barriers along with the general housekeeping of the facility.

Based on the above, CNSC staff concluded that OPG's conventional health and safety SCA met all applicable regulatory requirements and CNSC expectations.

Performance

Licensees are required to report to the CNSC as set out under paragraph 29(1)(h) of the GNSCR. These reports include serious illnesses or injuries incurred or possibly incurred as a result of a licensed activity.

OPG maintains an Employee Health and Safety Policy and Environment Health and Safety (EHS) Management system as part of this SCA. CNSC staff reviewed these documents and consider them acceptable. The EHS Management system incorporates various elements, such as accident reporting and investigation, hazard prevention, health and safety committees, training, and health and safety risk assessments.

OPG sets annual health and safety targets that are measured and evaluated throughout the year to ensure the effectiveness of OPG's health and safety systems. A corrective action process is in place to ensure incident causes, non-compliances or improvement opportunities related to health and safety are addressed effectively.

The key performance indicators typically reported to the Commission for conventional health and safety are the number of lost-time injuries (LTI) that occur per year, LTI severity and LTI frequency. An LTI is defined as an injury that takes place at work, and results in the worker being unable to return to work and carry on their duties for a period of time. The LTI frequency and LTI severity are both based on 100 full time workers (100 FTE = 200,000 hours worked).

The facility has worked without a lost-time injury for its entire operational period of 14 years and therefore, the LTI severity and frequency rate have also been zero throughout this period.

Practices

OPG's activities and operations must comply with the *Occupational Health and Safety Act of Ontario* and the *Labour Relations Act*. This means that OPG is required to report to the Ministry of Labour on incidents resulting in an injury. The facility is part of OPG's Joint Health and Safety Committee for the Darlington NGS site and includes management and employee representatives. OPG's Joint Health and Safety Committee inspects the workplace and meets monthly to resolve and track any issues related to health and safety. CNSC staff review health and safety documentation to verify that any identified issues related to health and safety are promptly resolved.

Awareness

Licensees are responsible for ensuring that workers have the knowledge to identify workplace hazards and take the necessary precautions to protect against these hazards. This is accomplished through training and ongoing internal communications with workers.

During routine onsite inspections, CNSC staff verified that workers are trained to identify hazards at the facility. CNSC staff confirmed that OPG has effectively implemented their conventional health and safety programs to keep workers safe.

CNSC staff confirmed that OPG has health and safety programs that promote conventional health and safety through the provision of information, training, instructions and supervision.

During the COVID-19 pandemic, OPG has implemented mitigation steps as part of its plans to combat the spread of the COVID-19 virus. This includes:

- Detailed and on-going employee communications to increase awareness of COVID-19, minimize potential risks, and ensure safe and reliable operations.
- Initial shutdown of the facility during the onset of the COVID-19 pandemic.
- After the shutdown, implementing a 1 week on, 1 week off schedule for personnel working at the facilities – this helps to minimize the total number of personnel at the facility at a given time.
- Utilization of health and safety measure such as masks, hand sanitization stations and sanitation of work areas.
- Development of a protocol for visitors (i.e., questionnaire required for all visitors).
- Continuous evolution of enhanced personal protective equipment as information becomes available (such as a transition to triple layer masks).
- OPG screens all workers into the facility for COVID-19 symptoms, recent travel, and orders to self-isolate where appropriate. Thermal imaging is conduced on all personnel entering the protected area

3.8.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.8.3.1 Past Performance

CNSC inspectors routinely verify OPG's conventional health and safety program during general compliance inspections. CNSC staff issued one low safety significance notice of non-compliance for conventional health and safety during the licensing period. This enforcement action has been closed to CNSC staff's satisfaction.

CNSC staff are satisfied with OPG's past performance in the conventional health and safety SCA and that OPG continues to meet regulatory requirements.

3.8.3.2 Regulatory Focus

CNSC staff will continue to monitor OPG's performance in this SCA through regulatory oversight activities including inspections and desktop reviews of relevant program documentation.

3.8.3.3 Proposed Improvements

OPG has the following proposed improvements with respect to the conventional health and safety SCA:

- Implementation of Fail-Safe Culture Change initiatives to build defenses into the planning of work, such as creating a learning organization, recognizing workers are the solutions, avoiding blaming the worker, and other key Fail-Safe concepts (Implementation time frame is Q1 2022 – Q2 2023).
- Implementation of a "Total Health Initiative" supporting employees and their families in their efforts to achieve an optimal level of health and functioning, primarily through health education, health promotion, disease and injury prevention, and crisis intervention. There is a continued focus on mental health and Musculoskeletal Disorder prevention with campaigns to raise awareness in these areas (Implementation time frame is ongoing throughout 2022 and 2023).

3.8.4 Conclusion

Based on CNSC staff assessments of OPG's application, supporting documents and past performance, CNSC staff conclude that OPG continues to implement and maintain an effective conventional health and safety program in accordance with regulatory requirements and CNSC expectations.

3.8.5 Recommendation

The current and proposed licence condition 8.1 requires the licensee to implement and maintain a conventional health and safety program. Compliance verification criteria for this licence condition are included in the draft LCH.

3.9 Environmental Protection

The environmental protection SCA covers programs that identify, control and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities.

The specific areas that comprise this SCA at the facility include:

- Effluent and emissions control (releases)
- Environmental management system (EMS)
- Protection of people
- Assessment and monitoring
- Environmental risk assessment

3.9.1 Trends

The following table indicates the overall rating trends for the Environmental Protection over the current licensing period:

TRENDS FOR ENVIRONMENTAL PROTECTION								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments								
OPG has implemented and maintained an effective environmental protection program in compliance with regulatory requirement and CNSC expectations. OPG continues to perform satisfactorily in this SCA. Radiological releases at this facility remained well below regulatory limits. Overall, CNSC staff conclude that OPG's performance in the environmental protection program meets regulatory requirements.								

3.9.2 Discussion

Effluent and Emissions Control

OPG continues to implement and maintain an effluent and emissions monitoring program at the facility as required by the CINFR. OPG's effluent and emissions monitoring program defines the methods and procedures for controlling and monitoring radioactive and hazardous substances, identifies and monitors discharge pathways for releases to the environment, and maintains releases below regulatory limits and action levels.

Radiological Releases

Radiological releases to air from the facility are well below the licence limit and the action level. The facility has a dedicated monitored active ventilation system in case of airborne particulates releases during the welding and vacuum drying of the DSCs. Particulates releases to air at the facility from 2013 to 2021 remained well below the licence limit and the action level.

Table 7: Annual airborne releases from DWMF compared with applicable licence release limits

Source	Year	Gross beta-gamma (Bq)	Licence limits (Bq)
Stack	2013	52,000*	6.70×10^{11}
	2014	48,620*	6.70×10^{11}
	2015	65,094*	6.70×10^{11}
	2016	2849	6.70×10^{11}
	2017	16983	6.70×10^{11}
	2018	12739	6.70×10^{11}
	2019	2812	6.06×10^{11}
	2020	5069	6.06×10^{11}
	2021	2516	$6.06\ 10^{11}$

*The data for airborne releases prior to 2016 are higher due to higher laboratory detection limits during that time.

There are no liquid emissions from the facility operations. The DSCs are fully drained, and vacuum dried after loading at the NGS and the elastomeric lid seals and drain plugs are present during transfer.

Stormwater and foundation drainage associated with the facility, is currently sampled weekly for tritium and gross gamma. The results are provided to CNSC staff on a quarterly basis (see table 8 below).

Table 8: Weekly average stormwater releases from the waste facility compared with applicable weekly administrative levels

Source	Year	Tritium (Bq/L) (Weekly average)	Tritium Weekly Administrative Levels (Bq/L)	Gross Gamma (Bq/L) (Weekly average)	Gross Gamma Weekly Administrative Levels (Bq/L)
Stormwater	2013	405	1850	7.91	37
	2014	1159	1850	7.70	37
	2015	593	1850	7.33	37
	2016	652	1850	8.55	37
	2017	543	1850	7.92	37
	2018	474	1850	7.41	37
	2019	493	1850	7.47	37
	2020	443	1850	7.60	37
	2021	536	1850	7.48	37

Stormwater and foundation drainage are primarily influenced by air emissions from the adjacent NGS (tritium in precipitation). Therefore, the numbers presented in table 8 are not directly linked to the facility operations.

OPG recently completed an assessment to demonstrate that routine monitoring is not required for radionuclides in stormwater and foundation drainage. CNSC staff reviewed and accepted OPG's assessment. OPG discontinued reporting stormwater monitoring results as of the first quarter of 2022.

Environmental Management System (EMS)

OPG has established and implemented an EMS in accordance with CNSC REGDOC-2.9.1 - *Environmental Protection Policies, Programs and Procedures* and is registered to the CSA ISO 14001 *Standard, Environmental Management Systems – Requirements with Guidance for Use*.

OPG's environmental management and its supporting governing documents establish the provision of the protection of the environment at the Darlington Site and continual improvement of environmental performance as required by CNSC REGDOC-2.9.1.

Assessment and Monitoring

OPG's environmental monitoring program is designed to measure environmental radioactivity and radiation in the vicinity of the Darlington site which includes the waste facility. Based on this program, environmental samples from different pathways of the food chain are collected from various offsite locations and analyzed. Data from the program are also used to assess public doses resulting from the routine operation of the Darlington Site, and to verify predictions made in environmental risk assessments.

Review of OPG's results of the environmental monitoring programs reports for the period of 2013-2021 shows that the concentration of radionuclides in the environment resulted in dose to the public that are well below regulatory limits. See table 9 below.

The Darlington Site is going to complete the implementation of N288.7-15 Groundwater Protection Programs at Class 1 Nuclear Facilities and Uranium Mines and Mills by December 31, 2022 [9].

CNSC's Independent Environmental Monitoring Program

The CNSC has implemented its Independent Environmental Monitoring Program (IEMP) as an additional verification that Indigenous Nations and communities, the public, and the environment around licensed nuclear facilities are protected. It is separate from, but complementary to, the CNSC's ongoing compliance verification program. The IEMP involves taking samples from public areas around the facilities and analyzing the amount of radiological and hazardous substances in those samples. CNSC staff collect the samples and send them to the CNSC's laboratory in Ottawa for testing and analysis.

IEMP at the Darlington Nuclear (DN) site

CNSC staff conducted IEMP sampling around the DN site in 2021, 2017, 2015 and 2014. For the 2021 sampling campaign, Indigenous Nations and communities were contacted and engaged by CNSC staff ahead of the development of the site-specific sampling plan but did not provide specific sampling media or parameters to be used. However, Curve Lake First Nation had the opportunity to observe the 2021 IEMP sampling campaign for the DN site. The sampling campaign focused on radiological and hazardous contaminants and took into consideration OPG's site wide EMP and the CNSC's regulatory knowledge of the site.

The levels of radioactive substances (including gross alpha, gross beta, and tritium) and hazardous substances (including iron, aluminum, and zinc) in all samples measured during the 2021 IEMP sampling campaign were below available guidelines and similar to the range of results from the 2017, 2015 and 2014 IEMP sampling campaigns at the DN site. Results for all campaigns are published on the CNSC's IEMP webpage.

The CNSC's IEMP results in 2021 are consistent with the results submitted by OPG, supporting the CNSC's assessment that the licensee's EP program is effective. The results add to the body of evidence that people and the environment in the vicinity of the DN site are protected and that there are no anticipated health impacts.

Protection of People

This specific area within the EP SCA is related to ensuring that members of the public are not exposed to "unreasonable" risk with respect to radiological and hazardous substances discharged from the facility.

Hazardous substances

Hazardous substances releases at the facility are very low. DSC paint touch-up operations involve minimal paint quantities. Residual paint aerosols from the paint bays are removed through filters before exhausting to the active ventilation system and exhausted through a High Efficiency Particulate Air filter. Thus, the hazardous substance releases at the facility including the emissions from welding are very low.

Maximum Effective Dose to a Member of the Public

Radiological emissions from the facility are a small fraction of the overall emissions from the Darlington Nuclear site thus its dose to the public contribution from the waste facility operation is small. The following table provides the doses to the public from the Darlington Site over the current licensing period:

Table 9: Dose to the public due to the concentration of radionuclides in the environment

DOSE TO A MEMBER OF THE PUBLIC[1]										
Dose Statistic	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**Regulatory Limit**
Maximum Effective Dose (mSv)	0,0006	0,0006	0,0005	0,0006	0,0007	0,0008	0,0004	0,0004	0,0006	1 mSv/year

1. OPG does not calculate individual public dose for DMWF. It calculates an annual site public dose which is reported annually in OPG's Annual Environmental Monitoring report (www.opg.com)

Environmental Risk Assessment (ERA)

An ERA of nuclear facilities is a systematic process used by licensees to identify, quantify, and characterize the risk posed by contaminants and physical stressors in the environment on human and other biological receptors, including the magnitude and extent of the potential effects associated with a facility. The ERA serves as the basis for the development of site-specific EP control measures and EMPs. The results of these programs, in turn, inform and refine future revisions of the ERA.

OPG Darlington's ERA is a site wide ERA encompassing DNGS and the waste facility and shall be compliant with CSA N288.6 *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills*.

In 2021, OPG submitted the *2020 Environmental Risk Assessment for the Darlington Nuclear Site* in accordance with the requirements set out in CSA N288.6-12, which stipulates that licensees must review and revise their ERA every 5 years. The DN site-wide ERA included an ecological risk assessment and a human health risk assessment for radiological and hazardous contaminants and physical stressors.

CNSC staff provided comments on the submission and OPG subsequently submitted a revised ERA to the CNSC in February 2021. CNSC staff reviewed OPG's revised ERA and found it to be compliant with CSA N288.6-12, and that no new risks have emerged since the previous ERA.

Environmental protection review (EPR) report

The CNSC conducted an EPR specific to the facility to assess OPG's environmental protection and environmental compliance activities conducted under the NSCA. CNSC staff's technical review of OPG's environmental protection activities has found that human health and the environment around the facility are protected. The EPR report for the facility is available on the CNSC website.

3.9.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.9.3.1 Past Performance

Performance levels for this SCA have been consistent from year to year, with 'Satisfactory' ratings given throughout the licence period. Satisfactory ratings indicate that the licensee has implemented effective safety and control measures and is in compliance with regulatory requirements and CNSC expectations. OPG has continued to implement effective environmental protection programs and associated environmental management system in accordance with CNSC requirements.

3.9.3.2 Regulatory Focus

CNSC staff will continue to monitor OPG's performance in this SCA through regulatory oversight activities including inspections and desktop reviews of relevant program documentation.

Furthermore, CNSC staff activities over the next licence period for the UFDSS#3 and #4 will include the following:

- Technical Assessment of the environmental management plan, preliminary safety analysis, project design requirements and construction verification plan
- Technical Assessment of the commissioning reports

3.9.3.3 Proposed Improvements

REGDOC-2.9.1, *Environmental Principles, Assessments and Protection Measures*, Version 1.2 (2020) was published in September 2020. CSA N288.1-20, *Guidelines for modelling radionuclide environmental transport, fate and exposure associated with the normal operation of nuclear facilities* was published in March 2020. CSA N288.8-17, *Establishing and Implementing Action Levels to Control Releases to the Environment from Nuclear Facilities* was published in February 2017 and reaffirmed in 2022.These three documents will apply to the facility operations. CNSC staff have requested that OPG conduct a gap analysis and implementation plan to align the environmental protection program with the requirements in the recent versions of REGDOC-2.9.1, CSA N288.1 and CSA N288.8.

3.9.4 Conclusion

Based on CNSC staff assessments of OPG's licence application, supporting documentation and past performance, CNSC staff conclude that OPG continues to implement and maintain an environmental protection program in accordance with regulatory requirements.

3.9.5 Recommendation

The current and proposed licence condition 9.1 requires OPG to implement and maintain an environmental protection program, which includes a set of action levels. Compliance verification criteria for this licence condition are included in the draft LCH.

3.10 Emergency Management and Fire Protection

The SCA Emergency Management and Fire Protection Covers emergency plans and emergency preparedness programs that exist for emergencies and for non-routine conditions. This area also includes any results of participation in exercises. OPG's fire protection program aims to minimize both the probability of occurrence and the consequences of fire at the facility.

The specific areas that comprise this SCA at the facility include:

- Nuclear emergency preparedness and response
- Fire emergency preparedness and response
- Conventional emergency preparedness and response
- Fire Protection Program

3.10.1 Trends

The following table indicates the overall rating trends for the Emergency Management and Fire Protection over the current licensing period:

TRENDS FOR EMERGENCY MANAGEMENT AND FIRE PROTECTION								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments								
OPG has implemented an emergency management program that meets the requirements of REGDOC-*2.10.1: Nuclear emergency preparedness and response, version 2*. OPG has implemented a fire protection program that meets the requirements of CSA N393-13, *Fire Protection for Facilities that Process, Handle, or Store Radioactive Substances*. Over the licence period, CNSC staff have verified that OPG has maintained its emergency preparedness and fire protection program through compliance verification activities. OPG received a SA rating for this SCA throughout the licence period.								

3.10.2 Discussion

The emergency management and fire protection SCA covers the provisions for a licensee to have in place an emergency preparedness plan and response capability which can mitigate the effects of accidental releases of radiological and hazardous substances into the environment during emergency and non-routine conditions.

This SCA also includes implementation of a fire protection program (FPP) to prevent or minimize the risk that fire poses the health and safety of persons and to the environment, through appropriate fire protection system design, fire safe operation and fire prevention.

Emergency Preparedness and Response

OPG has a written agreement with the Municipality of Clarington to provide emergency response services with support from site personnel, within the Darlington site boundary but outside the DNGS protected area for fire, medical, rescue and HAZMAT events. Site support can include operations, security staff and Emergency Response Team (ERT) personnel.

OPG conducts regular training, drills and exercises involving the Clarington Municipal Fire Department to ensure their familiarity with the site, opportunities to train together, as well as to ensure compatibility of response resources between the onsite and offsite response organizations. This includes live fire training alongside the DNGS ERT at the Wesleyville Fire Training Academy.

CNSC staff verified that OPG has implemented and maintained an emergency preparedness program at the facility to address and respond to emergencies, both onsite and offsite, and events that can affect the facility throughout the current licence period. During the licence period, OPG became fully compliant with CNSC REGDOC-*2.10.1: Nuclear emergency preparedness and response, version 2 (2016).*

Fire Protection Program

OPG's FPP has been established to comply with the CSA N393-13, *Fire Protection for Facilities that Process, Handle, or Store Radioactive Substances* and aim to minimize both the probability of occurrence and the consequences of fire at the facility CNSC staff reviewed OPG's FPP and found it to meet regulatory requirements.

OPG has performed Third Party FPP Audit and the Annual Third-Party Plant Condition Inspections to meet the requirements of the requirements of CSA N393, NBCC-2015 and NFCC-2015. The results from the Third-Party Assessments did not identify any significant findings and concluded that the FPP has been implemented effectively and in accordance with CSA N393-13, NFCC-2015 and the NBCC-2015. CNSC staff performed desktop review of OPG's Third-Party Assessments and concluded that they are acceptable and meet regulatory requirements.

3.10.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.10.3.1 Past Performance

OPG continues to effectively implement an emergency preparedness program and FPP, which adequately protects workers, the public and the environment from emergency or non-routine conditions.

CNSC staff are satisfied with the emergency preparedness and fire protection measures taken by OPG during the current licensing period with respect to this SCA and concluded that they meet CNSC regulatory requirements.

CNSC staff monitor OPG's FPP performance through regulatory oversight activities including onsite inspections and desktop reviews of the facility compliance reporting and revisions to relevant program documentation pertaining to this SCA

In March 2018, CNSC staff conducted an inspection at the facility and found that OPG was not conducting the required annual fire drills to test fire response capability. As a result, CNSC staff inspected OPG's fire response drill at the waste facility which took place in September 2019 and identified a finding of medium safety significance.

The finding was a result of a personnel accounting issue during the fire drill, where one OPG staff member did not evacuate to one of the two assembly areas. The worker exited the facility and was only accounted for 30 minutes after the fire alarm had sounded. The missing worker was unaware of correct OPG emergency procedures for staff in the event of a fire alarm. OPG addressed this by updating their training and requiring that OPG staff complete the updated training. During the 2020 annual fire drill, CNSC staff further verified that that the corrective action was successful.

CNSC staff further noted 1 non-compliance with low safety significance during inspections at the facility in 2020. OPG immediately resolved the issue, and CNSC staff found the actions to be acceptable.

OPG has reported non compliances in accordance with regulatory requirements (e.g., fire dampers not annually inspected, Notification of Deferral of Weekly Fire Pump Test). The reported non-compliances were low safety significance in nature and are not considered to have a significant negative impact on protection from fire, nor are they considered to present an unreasonable risk to persons and the environment. The corrective actions from the compliance reporting indicated that OPG has a satisfactory FPP.

CNSC staff has reviewed OPG's Quarterly Reports regarding fire protection and did not identify any items of regulatory concern. Quarterly Reports were found to be acceptable and meet regulatory requirements.

CNSC staff has assessed OPG's documentations and analyses related to fire protection and conclude that OPG has an acceptable fire protection program that meets regulatory requirements. OPG has been implementing its fire protection program in accordance with CSA N393.

3.10.3.2 Regulatory Focus

CNSC staff will continue to monitor OPG's performance in the Emergency Management and Fire Protection SCA through regulatory oversight activities including onsite inspections, desktop reviews of quarterly and annual compliance reports, desktop reviews of third-party reports, and desktop reviews of revisions to relevant program documentation pertaining to this SCA.

CSA N393 requires the Fire protection assessment (FHA and CCR) to be updated or confirmed at least once every five years to reflect nuclear facility modifications, any significant changes in fire hazards, operating experience, and operational changes. CNSC staff will continue to monitor the maintenance of OPG's Fire Protection assessment.

Furthermore, CNSC staff activities over the next licence period for UFDSS#3 and #4 will include the following:

- Technical Assessment of the preliminary safety analysis, project design requirements and construction verification plan
- Technical Assessment of the commissioning reports

3.10.3.3 Proposed Improvements

The National Fire Code of Canada (NFCC) 2020 and the National Building Code of Canada (NBCC) 2020 were published in March 2022 and will apply to this facility's operations. CSA N393:22 Fire protection for facilities that process, handle, or store nuclear substances, published in September 2022 will also apply. CNSC staff have requested that OPG develop an implementation plan to align the fire protection program with the requirements set in the 2020 published version of the NFCC, the 2022 version of N393 and to ensure that the new storage structures and modifications to the existing buildings meet the requirements set in the 2020 published version of the NBCC.

3.10.4 Conclusion

OPG continues to improve its emergency preparedness and fire protection programs based on changes to regulatory requirements as well as lessons learned from exercises and drills.

Based on CNSC staff assessments of OPG's licence application, supporting documentation and past performance, CNSC staff conclude that OPG continues to implement and maintain an emergency preparedness and fire protection program in accordance with regulatory requirements.

3.10.5 Recommendation

Two licence conditions are included in both the current and proposed licence for this SCA. Licence condition 10.1 requires the licensee to implement and maintain an emergency preparedness program. Licence condition 10.2 requires the licensee to implement and maintain an FPP. Compliance verification criteria for these licence conditions are also provided in the draft LCH.

3.11 Waste Management

The waste management SCA covers internal waste-related programs that form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility. This area also covers the planning for decommissioning. The specific areas that comprise this SCA at the facility include:

- Waste characterization
- Waste minimization
- Waste management practices
- Decommissioning plans

3.11.1 Trends

The following table indicates the overall rating trends for the Waste Management over the current licensing period:

TRENDS FOR WASTE MANAGEMENT								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments								
OPG has implemented a waste management program and preliminary decommissioning plan that meets regulatory requirements. Over the licence period, CNSC staff have verified that OPG has maintained its waste management program and preliminary decommissioning plan through compliance verification activities. OPG received a SA rating for this SCA throughout the licence period.								

3.11.2 Discussion

OPG maintains a waste management program that is implemented at the facility and meets the requirements of the GNSCR, CSA Standard N292.0-19, *General principles for the management of radioactive waste and irradiated fuel*, and CSA Standard N292.3-14 *Management of low- and intermediate-level radioactive waste.*

In accordance with paragraph 3(k) of the CINFR, OPG is required to maintain a decommissioning plan throughout the life of the facility. OPG maintains a Preliminary Decommissioning Plan (PDP) for the DWMF as per CSA standard N294-19 *Decommissioning of Facilities Containing Nuclear Substances* and CNSC Regulatory Guide G-219, *Decommissioning Planning for Licensed Activities* (superseded by REGDOC-2.11.2, *Decommissioning*).

Waste Characterization, minimization and management practices

During the licensing period, OPG continued to employ effective programs for the waste characterization, minimization, and management practices at the facility.

Minimal low-level radioactive waste is generated during operations at the waste facility. OPG uses waste management procedures to ensure that the low-level radioactive waste generated at the facility is separated properly from clean waste. The low-level radioactive waste produced is sent to Darlington Nuclear Generating Station for segregation as necessary and eventually transported to Western Waste Management Facility for management. There are no intermediate or high-level radioactive wastes generated at the facility.

During this licensing period, CNSC staff observed OPG's minimization and characterization of low-level radioactive waste by segregating "likely-clean" and active waste throughout the facility via compliance inspections. CNSC staff determined that these activities were compliant with the waste minimization and characterization requirements of CSA N292.3 Management of Low and Intermediate-Level Radioactive Waste.

Decommissioning plans

In accordance with paragraph 3(k) of the CINFR, OPG is required to maintain decommissioning plans throughout the life of the facilities.

Planning for decommissioning is an ongoing process, taking place throughout each stage of the licensed facility lifecycle. The PDPs are updated and submitted to CNSC staff for review and acceptance at a minimum every five years or when required by the Commission. The PDPs provide the basis for periodic revision of the cost estimate for decommissioning and establishing the financial guarantee as discussed in section 5.2 of this CMD.

OPG chooses to hold a single consolidated Financial Guarantee covering all of its nuclear decommissioning liabilities, which is supported by decommissioning plans for each licensed site, including this facility. The PDP for the facility addresses the specific lifecycle stage, assumed decommissioning strategy and end state of the facility. The current PDP, submitted as part of the consolidated OPG submission package in 2017 covering the five-year review period from 2018 to 2022, meets the regulatory criteria set in CSA N294-09 Decommissioning of Facilities Containing Nuclear Substances and CNSC Regulatory Guide G-219, Decommissioning Planning for Licensed Activities (superseded by REGDOC-2.11.2, Decommissioning).

In 2022, OPG submitted the consolidated PDPs and financial guarantee package for the next review period from 2023 to 2027. CNSC staff reviewed OPG's PDP against regulatory criteria including CSA N294-19 *Decommissioning of Facilities Containing Nuclear Substances*, and generally found it to be acceptable however requested some clarifications from OPG and recommendations for future revisions. In addition, CNSC staff assessed the cost estimate associated with the PDP and found it to be acceptable and meets the criteria documented in CNSC regulatory guide *G-206, Financial Guarantees Guide for the Decommissioning of Licensed Activities*. OPG had begun the process of updating its cost estimate prior to the publishing of REGDOC-3.3.1 and therefore G-206 was used as guidance. CNSC staff's assessment of the most recent PDP, associated cost estimate, and financial guarantee were included in CMD 22-H104 [12].

OPG's decommissioning strategy for this facility is for prompt dismantling once regulatory approvals for decommissioning are obtained. This decommissioning strategy is based on the planned removal of used fuel and retube waste to their respective long-term waste disposal facilities prior to the start of decommissioning at the facility. Used fuel would be moved to the Adaptive Phased Management facility and retube waste would go to a long-term disposal facility for intermediate-level waste. Both facilities are assumed to become available prior to the start of the facility dismantling and demolition activities.
OPG expects little to no residual radioactivity to be present once all waste from operation is removed and therefore do not currently anticipate the need for any deferment of decommissioning activities.

Decommissioning of the waste facility is planned to occur concurrently with the decommissioning of the DNGS and the waste site will be restored to a similar state to that of the DNGS site, making it suitable for other OPG uses. By the end of decommissioning work, the facility would meet the site-specific release criteria as agreed with the CNSC for removal of regulatory control.

3.11.3 Summary

3.11.3.1 Past Performance

OPG's waste management program meets CNSC regulatory and performance objectives under the waste management SCA. CNSC staff monitored implementation of this program through regular compliance verification activities.

3.11.3.2 Regulatory Focus

CNSC staff will continue to monitor OPG's performance in this SCA through regulatory oversight activities including onsite inspections, desktop reviews of quarterly and annual compliance reports, and desktop reviews of revisions to relevant program documentation pertaining to this SCA.

3.11.3.3 Proposed Improvements

REGDOC-2.11.1, *Waste Management, Volume I: Management of Radioactive Waste*, REGDOC-2.11.2, *Decommissioning* and REGDOC 3.3.1, *Financial guarantees for decommissioning of nuclear facilities and termination of licensed activities* were published in January 2021 and will apply to the facility operations. CNSC staff have requested that OPG conduct a gap analysis and implementation plan to align the waste management and planning for decommissioning programs with the regulatory requirements set in the regulatory documents.

CSA N292.8-21, *Characterization of radioactive waste and irradiated fuel*, published in 2021, also applies to the facility's operations. CNSC staff have requested that OPG conduct a gap analysis and implementation plan to align the waste management program with the regulatory requirements of the latest version of the CSA standard.

3.11.4 Conclusion

Based on CNSC staff assessments of OPG's licence application and past performance, CNSC staff conclude that OPG continues to implement and maintains a waste management program in accordance with regulatory requirements. Additionally, CNSC staff conclude that the facility preliminary decommissioning plan meets regulatory requirements and provides a basis for a credible cost estimate for the future decommissioning of the nuclear facility covered under the OPG's consolidated financial guarantee.

3.11.5 Recommendation

Two licence conditions are included in both the current and proposed licence for this SCA. Licence condition 11.1 requires the licensee to implement and maintain a waste management program. Licence condition 11.2 requires the licensee to implement and maintain a preliminary decommissioning plan. Compliance verification criteria for both licence conditions are included in the draft LCH.

3.12 Security

The Security SCA Covers the programs required to implement and support the security requirements stipulated in the regulations, the licence, orders, or expectations for the facility or activity. The specific areas that comprise this SCA at the facility include:

- Facilities and Equipment
- Response Arrangements
- Security Practices
- Drills and Exercises

3.12.1 Trends

The following table indicates the overall rating trends for the Security over the current licensing period:

TRENDS FOR SECURITY								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
FS	FS	SA	SA	SA	SA	SA	SA	SA
Comments								
OPG has implemented and maintained a security program at the facility in accordance with regulatory requirements. Recent compliance ratings have identified that OPG satisfactorily has met regulatory requirements and expectations. Any past adverse findings have been addressed in a timely manner and to the satisfaction of CNSC staff. OPG's current compliance rating for the facility is Satisfactory.								

3.12.2 Discussion

The facility is a Class 1B nuclear facility, storing Category II nuclear material as defined in the *Nuclear Security Regulations* (NSR). The facility operating licence includes authorization to transport category II nuclear materials as defined in Section 1 of the NSR. OPG has provided a transportation security plan in support of the transportation activities which meets the requirements of Section 5 of the NSR and Regulatory Document REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material*, Version 2.1.

The site has physical protection systems and a security program that are equivalent to other high-security nuclear facilities. These physical protection measures meet the regulatory requirements.

The facility is inspected by CNSC staff on an eighteen (18) month cycle to verify compliance with regulatory requirements. Over the current licensing period, CNSC security inspections determined that OPG is implementing and maintaining a satisfactory security program that meets the requirements set out in Part 1 of the NSR.

OPG maintains a site security report that describes the facility security program. The most recent annual site security report was submitted in December 2021 and was assessed by CNSC staff as satisfactory.

An annual updated Threat and Risk Assessment was also submitted by the licensee in December 2021 and was assessed as satisfactory by CNSC staff.

Measures to effectively prevent theft or sabotage of nuclear material in use, storage or transport are in place at all high-security nuclear facilities, including this facility. Appropriate compensatory and corrective measures were taken by OPG in response to these events, which are now considered closed.

The evaluation of OPG's compliance with the Security SCA are based on findings made throughout the review period from inspections and desktop reviews as well as through performance testing. Based on the information assessed, CNSC staff concluded that the Security SCA at the facility met performance objectives and all applicable regulatory requirements throughout the review period.

Facilities and Equipment

OPG has demonstrated compliance in this specific area through the provision of adequate infrastructure, physical delay barriers, procedures, systems, devices and supporting security personnel to meet its security program requirements. In addition, the licensee has preventative and corrective maintenance programs in place for critical security systems and devices.

CNSC staff has assessed that the facility is equipped with satisfactory barriers at the protected area perimeter. Engineered barriers are utilized to minimize the risk of forced land vehicle penetration.

The facility is effectively equipped with intrusion detection systems that meet regulatory requirements. The lighting and alarm devices associated with the protected area barrier have also been rated as satisfactory by CNSC staff.

OPG utilizes concrete and steel-lined DSCs to store used fuel from the DNGS. These containers are very robust, weighing about 90 tons each when loaded. In combination with the physical barriers in place along the protected area perimeter, CNSC staff assess there is sufficient delay time for a response force to make an effective intervention in the event of an attempt of theft or sabotage of nuclear material at this location.

Security Practices

The licensee demonstrates compliance in this area through the provision of an effective program to control access to facilities, nuclear material and prescribed/classified information.

The facility is equipped with access control measures including a vehicle portal for screening vehicles entering the Protected Area for weapons, explosives and unauthorized persons. The vehicle portal is also the location where exiting vehicles are screened for nuclear material.

The facility has the necessary infrastructure and devices in place for controlling and screening pedestrians entering the Protected Area. Entry screening of personnel and hand-carried items for weapons and explosives is accomplished with the use of explosives substance detectors, X-ray imaging devices and metal detection devices. Pedestrians leaving the facility are subject to screening for the presence of nuclear material with the use of radiation portal monitors.

The licensee maintains a satisfactory security clearance program for access control to the facility.

Drills and Exercises

Training, exercises and drills are implemented by the licensee as a means of validating security procedures, regulatory compliance and identifying areas for improvement in all facets of security operations. The licensee provides trained and suitably equipped Nuclear Security Officers at the facility.

Response Arrangements

OPG has nuclear security officers to control access, respond to security incidents and perform routine patrols at the facility.

OPG maintains an armed 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.

Cyber Security

OPG’s nuclear cyber security program protects cyber assets that perform or impacts functions related to nuclear safety, nuclear security, emergency preparedness, and safeguard (also known as Cyber Essential Assets (CEAs)), from cyber-attack. The CEAs identified for the Nuclear Waste Management organization/facilities, including the waste management facility on the Darlington nuclear site, are protected under OPG’s nuclear cyber security program.

3.12.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.12.3.1 Past Performance

CNSC staff is satisfied that OPG continues to maintain a satisfactory security program and that meets regulatory requirements for security.

CNSC staff continues to conduct security compliance monitoring activities to verify that the security program and implementation meets regulatory requirements.

CNSC staff conducted four (4) Type II compliance inspections of the security program at the facility during the review period with the most recent being in February 2021. CNSC staff conducted desktop reviews of the annual site security report, annual threat and risk assessment and quarterly facility reports for security incidents during the review period. The results of this compliance activity confirmed that OPG continue to meet regulatory requirements, based on the inspection report issued to the licensee.

A Type II security compliance inspection was conducted in June 2022 (outside of the review period) with no notice of non-compliance.

There were three reportable security events for the facility of low security significance during the review period, one in 2020 and two in 2018. In all three cases, OPG implemented satisfactory compensatory and corrective measures in response to these events

3.12.3.2 Regulatory Focus

CNSC staff will continue to monitor OPG's performance in this SCA through regulatory oversight activities including onsite inspections, desktop reviews of quarterly and annual compliance reports, and desktop reviews of revisions to relevant program documentation pertaining to this SCA.

Furthermore, CNSC staff activities over the next licence period for UFDSS#3 and #4 will include the following:

- Technical assessment of the proposed security arrangements and measures for the two new storage structures or any potential modifications to the protected area associated with the two new storage structures,
- Technical assessment of the commissioning reports for the two storage structures

3.12.3.3 Proposed Improvements

REGDOC-2.12.1: *High Security Sites, Volume I: Nuclear Response Force, Version 2* was published in September 2018 and will apply to the facility operations.

CNSC staff have requested that OPG conduct a gap analysis and implementation plan to align the security program with the requirements in the regulatory document.

OPG is planning the following improvements to the existing security systems for the next licensing period:

- The facility integration into a Darlington site entry control system upgrade.
- Updates to the Darlington site security monitoring room infrastructure.
- Replacing existing intrusion detection and assessment systems with devices utilizing leading technology; and
- Upgrades to facility lighting.

3.12.4 Conclusion

Based on CNSC staff assessments of OPG's licence application, supporting documentation and past performance, CNSC staff conclude that OPG continues to implement and maintains a security program in accordance with regulatory requirements.

3.12.5 Recommendation

Two licence conditions are included in the current and proposed licence for this SCA. Licence condition 12.1 requires OPG to implement and maintain a security program. Licence condition 12.2 requires OPG to submit the proposed security arrangements and measures for the new used fuel dry storage structure, or any potential modifications to the protected area that may be associated with the new structures. Compliance verification criteria for these licence conditions are included in the draft LCH.

3.13 Safeguards and Non-Proliferation

The safeguards and non-proliferation SCA covers the programs and activities required for the successful implementation of the obligations arising from the Canada/International Atomic Energy Agency (IAEA) safeguards agreements as well as all other measures arising from the *Treaty on the Non-Proliferation of Nuclear Weapons.*

The specific areas that comprise this Safety and Control area are:

- Nuclear material accountancy and control
- Access and assistance to the IAEA
- Operational and design information
- Safeguards equipment, containment and surveillance

3.13.1 Trends

The following table indicates the overall rating trends for the Safeguards and Non-Proliferation over the current licensing period:

TRENDS FOR SAFEGUARDS AND NON-PROLIFERATION								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments								
OPG has implemented a safeguards program that meets applicable regulatory requirements for accountancy and control of nuclear material. Over the licence period, CNSC staff have verified that OPG has maintained its safeguards program through compliance verification activities. OPG received a SA rating for this SCA throughout the licence period.								

3.13.2 Discussion

In February 2018, the CNSC published REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy* superseding RD-336, *Safeguards and Nuclear Material Accountancy* and GD-336, the associated guidance document. REGDOC-2.13.1 sets out requirements and guidance for safeguards programs for applicants and licensees who possess nuclear material, carry out specified types of R&D work related to the nuclear fuel cycle, or carry out specified types of nuclear-related manufacturing activities. The requirements and guidance included in this document are essential to Canada's compliance with safeguards agreements with the IAEA. They are also compatible with modern national and international practices.

OPG maintains a safeguards program to comply with the current licence condition. In October 2021, OPG stated that they are fully compliant with the requirements in CNSC regulatory document REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*, including the requirements for new fuel, spent fuel and all non-fuel nuclear material. Overall, CNSC staff consider that the licensee meets the regulatory requirements related to safeguards.

Nuclear material accountancy and control

CNSC staff determined that the facility complied with CNSC's regulatory requirements in accordance with REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy.* OPG has submitted the required monthly general ledgers, among other required forms, over the licence period.

Access and assistance to the IAEA

CNSC staff determined that the facility granted adequate access and assistance to the IAEA for safeguards activities. During the licensing period, the IAEA performed several inspections and verification activities, including 5 Physical Inventory Verifications, 5 Design Information Verifications and 16 Unannounced Inspections. In all cases, the facility provided the IAEA with the necessary access and assistance to perform the activities and complied with all regulatory requirements.

Operational and design information

The licensee submitted its annual operational programs, annual and quarterly updates to the Additional Protocol and other required information to the IAEA and the CNSC in a timely manner. The CNSC reviewed these documents and determined that they met requirements and expectations. OPG has provided revisions to their Design Information Questionnaire throughout the licensing period to reflect the safeguards-relevant changes to the facility and its safeguards program.

Safeguards equipment, containment and surveillance

OPG provided the assistance required for the IAEA's safeguards equipment, containment and surveillance activities. IAEA safeguards equipment are installed at the facility. DSC Sealing activities were performed as required.

3.13.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.13.3.1 Past Performance

CNSC staff have assessed OPG documentation under the safeguards and non-proliferation SCA and have found the documentation to be acceptable and compliant with regulatory requirements for the current licensing period.

3.13.3.2 Regulatory Focus

CNSC staff will continue to monitor OPG's performance in this SCA through regulatory oversight activities including participation in IAEA inspections, performance of CNSC evaluations, and ongoing assessments of compliance with reporting requirements.

3.13.3.3 Proposed Improvements

OPG and the CNSC continue to review the IAEA's revised equipment infrastructure requirements documents for the equipment-based approach for IAEA verification of spent fuel transfers to dry storage. A series of technical meetings with the IAEA and OPG have been conducted and further discussions are to be planned in the future to resolve the remaining technical issues.

3.13.4 Conclusion

Based on CNSC staff assessments of OPG's licence application, supporting documentation and past performance, CNSC staff conclude that OPG continues to implement and maintains a safeguards program in accordance with regulatory requirements.

3.13.5 Recommendation

The current and proposed licence condition 13.1 requires OPG to implement and maintain a safeguards program. Compliance verification criteria for this licence condition are included in the draft LCH.

3.14 Packaging and Transport

The packaging and transport SCA pertain to programs that cover the safe packaging and transport of nuclear substances to and from the licensed facility.

The specific areas that comprise this SCA at the facility are not addressed individually in this document.

- Package design and maintenance
- Packaging and transport
- Registration for use

3.14.1 Trends

The following table indicates the overall rating trends for the Packaging and Transport over the current licensing period:

TRENDS FOR PACKAGING AND TRANSPORT								
Overall Compliance Ratings								
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments								
Packaging and Transport of Nuclear Substances Regulation (PTNSR), 2015 applies only to off-site transport of nuclear substances. During the licensing period, OPG has not made any off-site transport of nuclear substances from the facility. However, OPG continues to maintain a packaging and transport program to ensure all shipments leaving the site are in compliance with the PTNSR, 2015 and the *Transportation of Dangerous Goods (TDG) Regulations*. Over the licence period, CNSC staff have verified that OPG has maintained its Packaging and Transport Program through compliance verification activities. OPG received a SA rating for this SCA throughout the licence period.								

3.14.2 Discussion

The packaging and transport SCA pertain to programs that cover the safe packaging and transport of nuclear substances to and from the licensed facility. PTNSR, 2015 applies only to off-site transport of nuclear substances. During the licensing period, OPG has not made any off-site transport of nuclear substances from or to the waste facility.

OPG has developed and implemented a packaging and transport program to ensure all shipments leaving the site are in compliance with the PTNSR, 2015 and the TDG Regulations. OPG's packaging and transport program covers elements of package design and maintenance, and the registration for use of certified packages as required by the regulations. Details of CNSC's staff assessment are presented in the following paragraphs.

The PTNSR, 2015 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. OPG is required to have appropriate training for personnel involved in the handling, offering for transport and transport of dangerous goods

at the facility, and is required to issue a training certificate to those workers in accordance with the TDG Regulations. CNSC staff conducted desk-top reviews of OPG's packaging and transport program. CNSC staff determined that packaging and transport of nuclear substances at the facility meets regulatory requirements.

3.14.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

3.14.3.1 Past Performance

OPG's packaging and transport program met CNSC regulatory requirements and performance objectives under the packaging and transport SCA. CNSC staff monitored OPG's performance through regular compliance verification activities. Overall, OPG's packaging and transport program meets regulatory requirements.

3.14.3.2 Regulatory Focus

CNSC staff will continue to monitor shipments transported to and from the facility through regulatory oversight activities including inspections and desktop reviews of relevant program documentation.

3.14.3.3 Proposed Improvements

OPG is not planning any substantive changes to its packaging and transport program for the next licensing period.

Based on the effective implementation of the current program, this is acceptable to CNSC staff.

3.14.4 Conclusion

Based on CNSC staff assessments of OPG's licence application, supporting document and past performance, CNSC staff conclude that OPG continues to implement and maintain an effective packaging and transport program that meets regulatory requirements.

3.14.5 Recommendation

The current and proposed licence condition 14.1 requires OPG to implement and maintain a packaging and transport program. Compliance verification criteria for this licence condition are included in the draft LCH.

4. INDIGENOUS AND PUBLIC CONSULTATION AND ENGAGEMENT

4.1 Indigenous Consultation and Engagement

The common-law duty to consult with Indigenous Nations and Communities applies when the Crown contemplates actions that may adversely affect potential or established Indigenous and/or treaty rights. The CNSC ensures that all of its licence decisions under the NSCA uphold the honour of the Crown and consider Indigenous peoples' potential or established Indigenous and/or treaty rights pursuant to section 35 of the Constitution Act, 1982.

CNSC staff are committed to building long-term relationships with Indigenous Nations and communities who have interest in CNSC-regulated facilities within their traditional and/or treaty territories. The CNSC's Indigenous engagement practices include sharing information, discussing topics of interest, seeking feedback and input on CNSC processes, and providing opportunities to participate in environmental monitoring. The CNSC also provides funding support (through the CNSC's Participant Funding Program) for Indigenous peoples to meaningfully participate in Commission proceedings and ongoing regulatory activities.

4.1.1 Discussion

4.1.1.1 CNSC Staff Engagement Activities

CNSC staff identified the following Indigenous Nations and communities who may have interest in or be potentially affected by the renewal of OPG's Waste Facility Operating Licence:

- Alderville First Nation
- Curve Lake First Nation
- Hiawatha First Nation
- The Mississaugas of Scugog Island First Nation
- The Chippewas of Beausoleil First Nation
- The Chippewas of Georgina Island First Nation
- Chippewas of Rama First Nation
- Mohawks of the Bay of Quinte
- The Métis Nation of Ontario
- Six Nations of the Grand River

These Indigenous Nations and communities were identified due to the proximity of their communities, treaty areas and/or traditional territories to the Darlington site, or due to previously expressed interest in being kept informed of CNSC licensed activities occurring in or proximal to their territories. The umbrella organization Anishinabek Nation was also notified of updates provided to their member nations, as previously requested.

CNSC staff have been engaging with the identified Indigenous Nations and communities concerning the Darlington site on an ongoing basis and has Terms of Reference (ToR) in place for long-term engagement with Curve Lake First Nation, the Mississaugas of Scugog Island First Nation and the Metis Nation of Ontario. The ToR's provide a forum for collaboration and a structure for regular meetings to address areas of interest regarding CNSC-regulated facilities and activities within their traditional and treaty territory, including the Darlington site.

In relation to OPG's request to renew its licence, CNSC staff sent letters of notification in March 2022 to the Indigenous Nations and communities listed above. These letters provided information regarding the licence renewal application and details on how to participate in the Commission's public hearing process. Follow-up phone calls were conducted to confirm receipt of the letters and to answer any questions. In June 2022, CNSC staff sent emails to the identified Indigenous Nations and communities to notify them that participant funding was available to support and enhance their participation in the hearing process.

CNSC staff followed up with each Indigenous Nation and community in August 2022 regarding the participant funding opportunity, and to share the Notice of Hearing and offer to meet to discuss any questions or concerns. All of the identified Indigenous Nations and communities were encouraged to participate in the Commission's public hearing process in order to advise the Commission directly of any concerns they may have in relation to this decision-making matter.

To date, no issues have been raised by the identified Indigenous Nations and communities related to potential impacts on Indigenous and/or treaty rights as a result of the renewal of OPG licence. CNSC staff are committed to continuing to address any concerns that are raised and to provide information pertaining to the facility. Follow-up activities will be conducted with Indigenous Nations and communities who express any remaining concerns about the facility following the Commission hearing, where necessary.

4.1.1.2 Licensee Engagement Activities

CNSC REGDOC-3.2.2, *Indigenous Engagement*, sets out requirements and guidance for licensees whose proposed projects may raise the Crown's duty to consult. Based on the information received in the OPG's application, this licence renewal is not expected to cause any new adverse impacts to potential or established Indigenous and/or treaty rights and therefore does not raise the formal requirements of REGDOC-3.2.2.

OPG has continued to reach out to all of the identified Indigenous Nations and communities through phone and/or email to provide information and updates about the licence renewal application and answer related questions. OPG has also provided facility tours to Indigenous Nations and communities upon request. To date, CNSC staff have not been made aware of any concerns expressed by Indigenous Nations and communities through OPG's engagement activities.

CNSC staff encourage OPG to continue engaging with the identified Indigenous Nations and communities regarding the facility and any on-going activities of interest, including the licence renewal application.

4.1.2 Conclusion

Based on the information received and reviewed, CNSC staff have concluded that this licence renewal application will not cause any new adverse impacts to any potential or established Indigenous and/or treaty rights. However, the CNSC is committed to meaningful, ongoing engagement with Indigenous Nations and communities that have an interest in or may be potentially affected by CNSC-regulated facilities and activities. CNSC staff notified and encouraged the identified Indigenous Nations and communities to participate in the regulatory review process, including the Commission's public hearing to advise the Commission directly of any concerns they may have in relation to this request.

4.2 CNSC Public Consultation and Engagement

The NSCA mandates the CNSC to disseminate objective scientific, technical and regulatory information to the public concerning its activities and the activities it regulates. CNSC staff fulfill this mandate in a variety of ways, including hosting in-person and virtual information sessions and through annual regulatory reports.

4.2.1 Discussion

In accordance with section 17 of the *Canadian Nuclear Safety Commission Rules of Procedure*, a Notice of Public Hearing has been issued and posted on the CNSC website inviting written comments and requests for appearances before the Commission. CNSC staff also communicated information about the regulatory process for the renewal of OPG WFOL to the public, stakeholders and Indigenous communities through various methods including feature articles, mail drops, graphics on the CNSC website, meetings, media and public webinars, and social media accounts.

4.2.2 Conclusion

CNSC staff continue to inform the public and Indigenous communities of our regulatory activities through regular website updates, publicly webcast Commission proceedings, social media, public webinars, mail drops and regular discussion with key audiences near the facility. CNSC staff encourage the public and Indigenous communities to participate in the Commission's public hearing. The Participant Funding Program (PFP) was offered to assist interested members of the public, Indigenous peoples, and other stakeholders to prepare for and participate in the Commission's public hearing.

4.2.3 Licensee Public Information and Engagement

A Public Information and Disclosure Program (PIDP) is a regulatory requirement for licence applicants and licensees of Class I nuclear facilities, uranium mines and mills and certain Class II nuclear facilities. These requirements are found in REGDOC-3.2.1, *Public Information and Disclosure*.

The primary goal of the PIDP is to ensure that information related to the health, safety and security of persons and the environment, and other issues associated with the lifecycle of nuclear facilities are effectively communicated to the public. The program must include a commitment to, and protocol for ongoing, timely communication of information related to the licensed facility during the course of the licence period.

CNSC's expectations of a licensee's public information program and disclosure protocol are commensurate with the level of risk of the facility, as well as the level of public interest in the licensed activities. The program and protocol may be further influenced by the complexity of the nuclear facility's lifecycle and activities, and the risks to public health and safety and the environment perceived to be associated with the facility and activities.

Discussion

During the current licence period, OPG's communications department executed the following activities in support of the waste facility:

- Eighteen (18) Darlington newsletters distributed to a combined audience of 250,000 households.
- Sixty-one (61) tours and presentations of the facility to interested groups and stakeholders.
- Over 52,680 users visited OPG's waste and Deep Geologic Repository websites.
- From 2012, OPG attended twenty-four (24) Durham Nuclear Health Committee meetings and forty-seven (47) Community Advisory Council meetings to provide updates or to respond to questions about nuclear waste operations.
- 20 public open houses were held on the Darlington Refurbishment Project, which provided the community information, exhibits and an opportunity for the public to ask questions, obtain clarification, and identify or raise any concerns or issues they may have pertained to current waste operations or the continued operations.

Conclusion

OPG's websites provides information to the public and offers opportunities for further contact. Several newsletters, reports and media releases can be found on the licensee's website.

4.3 Participant Funding Program

The CNSC established the Participant Funding Program (PFP) in 2011 to:

1. enhance individual, not-for-profit organization and Indigenous Nations and Communities participation in the CNSC's environmental assessment (EA) and licensing processes for major nuclear facilities (e.g., uranium mines, nuclear power plants, nuclear substance processing, or nuclear waste facilities)
2. assist individuals, not-for-profit organizations and Indigenous Nations and Communities to bring value-added information to the Commission through informed and topic-specific interventions related to EAs and licensing (i.e., new, distinctive and relevant information that contributes to a better understanding of the anticipated effects of a project)

4.3.1 Discussion

Up to C$75,000 in participant funding was made available in relation to assist members of the public, Indigenous Nations and communities, and stakeholders in providing value-added information to the Commission through informed and topic-specific interventions. This funding was offered to review OPG's licence renewal application and associated documents and to prepare for, and participate in, the Commission's public hearing.

The deadline for applications was August 19, 2022. A Funding Review Committee (FRC), independent from CNSC staff, reviewed the applications received, and made recommendations on the allocation of funding to eligible applicants. Based on recommendations from the FRC, the CNSC awarded a total of $69,735.95 in participant funding to the following recipients:

- Curve Lake First Nation
- Mississaugas of Scugog Island First Nation
- Nuclear Transparency Project
- Canadian Association of Nuclear Host Communities
- Northwatch

4.3.2 Conclusion

The CNSC offered assistance to interested members of the public, Indigenous Nations and communities, and other stakeholders, through the PFP, to prepare for and participate in the Commission's public hearing.

5. OTHER MATTERS OF REGULATORY INTEREST

5.1 Cost Recovery

It is a requirement of the NSCA under paragraph 24(2)(c), that the licence application be accompanied by the prescribed fee. The Cost Recovery Fees Regulations (CRFR) set out the specific requirements based on the activities to be licensed. An applicant for a Class I facility licence is subject to "Part 2" of CRFR, which is based on "Regulatory Activity Plan Fees".

5.1.1 Discussion

After reviewing CNSC records, CNSC staff conclude that OPG is in good standing with respect to CRFR requirements for the facility. Based on OPG's previous performance, there are no concerns regarding the payment of future cost recovery fees.

5.1.2 Conclusion

CNSC staff have determined that OPG is in good standing with respect to CRFR requirements for the waste facility.

5.1.3 Recommendation

There is no requirement for any additional licensing activity or any additional licence conditions.

5.2 Financial Guarantees

A financial guarantee (FG) for decommissioning must be established to fund the activities described in the PDP. The NSCA stipulates that the FG shall be in a form that is acceptable to the Commission. The NSCA and associated Regulations require that licensees make adequate provision for the safe decommissioning of their facilities. Regulatory guidance and the associated acceptance criteria for establishing a FG is provided in the CNSC REGDOC-3.3.1, *Financial Guarantees for the Decommissioning of Nuclear Facilities and Termination of Licensed Activities*, published in January 2021. The REGDOC includes guidance on the attributes of an acceptable FG in terms of liquidity, certainty, adequacy of value and continuity.

Prior to that, regulatory guidance and the associated acceptance criteria for establishing a financial guarantee were provided in the CNSC regulatory guide *G-206, Financial Guarantees Guide for the Decommissioning of Licensed Activities*.

OPG currently maintains a financial guarantee for decommissioning of the facility as per condition G.3 of its current licence.

5.2.1 Discussion

OPG maintains a consolidated financial guarantee for decommissioning of all OPG and Bruce Power operated nuclear facilities in Ontario. The financial guarantee is based upon preliminary decommissioning plans and cost estimates for decommissioning prepared by OPG for each facility. This facility is covered under the OPG consolidated financial guarantee. The 2018-2022 consolidated financial guarantee for the decommissioning of the OPG owned facilities was accepted by the Commission in 2017. For the 2018-2022 review period, the financial guarantee was satisfied by the funds accumulated in OPG's Nuclear Funds.

Licence condition G.3 requires that OPG maintain a financial guarantee for decommissioning. To ensure that the financial guarantee remains valid, in effect and sufficient, a requirement is included in the LCH that OPG revise the financial guarantee and the associated decommissioning plans at a minimum every five years or when requested by the Commission.

In 2022, OPG submitted an updated financial guarantee proposal for the next five-year review period from 2023 to 2027. CNSC staff 's assessment of the proposed financial guarantee were included in CMD 22-H104. CNSC staff verified the financial guarantee is based on the most up to date PDP and meets the criteria G-206 in accordance with the contents of the revised PDP and assessed the cost estimate against the criteria documented in CNSC regulatory guide *G-206, Financial Guarantees Guide for the Decommissioning of Licensed Activities* and found it acceptable.
OPG had begun the process of updating its PDP and cost estimate prior to the publishing of REGDOC-3.3.1 and therefore G-206 was used as guidance. For the 2023 – 2027 review period, OPG had estimated a constant dollar value of $46,117 M representing what it would cost to conduct the decommissioning in 2023. The present value of the future cost represents $20,480 M as of January 1, 2023.

The current financial guarantee is satisfied by the funds accumulated in OPG's Nuclear Funds, which consists of the Ontario Nuclear Funds agreement (comprised of the Decommissioning Segregate Fund and Used Fuel Segregate Fund) and the Nuclear Fuel Waste Act Trust Fund.

OPG is also required to report annually to the CNSC on the status and adequacy of the financial guarantee through the submission of a written report.

Based on the CNSC staff review of the annual reports during the 2018-2022 period, the net asset balance in the OPG segregate funds was sufficient to cover the financial guarantee projection for each year. CNSC staff will continue to review annually the adequacy of the financial guarantee.

5.2.2 Conclusion

CNSC staff conclude that OPG has a valid and acceptable FG for decommissioning costs of the facility in place and that OPG met all reporting requirements throughout the licensing period.

5.2.3 Recommendation

The current and proposed licence condition G.3 requires OPG to implement and maintain a financial guarantee for decommissioning that is acceptable to the Commission. Compliance verification criteria for this licence condition are included in the draft LCH.

REGDOC-3.3.1: *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities* was published in January 2021 and will apply to the facility operations.

CNSC staff have requested that OPG conduct a gap analysis and implementation plan to align the financial guarantee with the requirements in the newly published regulatory document.

5.3 Licensee Public Information Program

All licensees are required to maintain and implement public information and disclosure programs (PIDP), in accordance with regulatory document REGDOC-3.2.1, *Public Information and Disclosure*. These programs are supported by disclosure protocols that outline the type of facility information to be shared with the public as well as details on how that information is to be shared. This ensures that timely information about the health, safety and security of persons and the environment, and other issues associated with the lifecycle of nuclear facilities, is effectively communicated to the public.

The program must include a commitment to, and protocol for, ongoing and timely communication of information related to the licensed facility during the licence period.

The CNSC's expectations of a licensee's public information program and disclosure protocol are commensurate with the level of risk of the facility, as well as the level of public interest in the licensed activities. The program and protocol may be further influenced by the complexity of the nuclear facility's lifecycle and activities, and the risks to public health and safety and the environment perceived to be associated with the facility and activities.

5.3.1 Discussion

The CNSC published REGDOC-3.2.1 in May 2018, superseding previous CNSC guidance and regulatory requirements for public engagement. OPG revised its existing PIDP to ensure full alignment with the REGDOC 3.2.1. CNSC staff reviewed the revised PIDP and confirmed that it aligns with the requirements of REGDOC-3.2.1. The revised program document has been incorporated into OPG LCH and any changes to this document are reviewed by CNSC staff

CNSC staff continue to monitor OPG's implementation of its PIDP for the facility to verify that it communicates regularly with its audiences in a way that is meaningful to them. CNSC staff also review yearly program updates to verify OPG is taking audience feedback into consideration and taking steps to implement program adjustments to meet the evolving needs of its audiences. All licensees have faced many challenges due to the COVID-19 pandemic and had to adapt their public information programs accordingly. This included moving away from traditional in-person meetings and events and offering webinars and increased digital communications whenever possible.

As described by OPG, communication activities for the facility include:

- Regular updates to OPG' s website and social media with the latest information on the facility;
- Organizing paid advertising to bring awareness to operations and activities at the facility;
- Distributing information, both print and online, via newsletters, email lists, information brochures, videos and fact sheets on operations and activities;
- Posting and communicating reports and regulatory information relating to health, safety and the environment;
- Ensuring public access to information and face-to-face contact, as requested;
- Participating in and hosting ongoing engagement activities, including community meetings, presentations, consultations and site tours for the local community;
- Providing various feedback mechanisms for the local community to comment or ask questions, as well as for OPG to respond to issues raised; and
- Engagement with local and national media, as requested.

CNSC staff are satisfied with the OPG's past performance related to the public information and disclosure, and its on-going commitment to effectively implement the PIDP.

5.3.2 Conclusion

CNSC staff found that, through the implementation of its PIDP, OPG has demonstrated strong communications activities of appropriate and timely information related to the facility to the public and community members. This has been done through the use of advertising materials, newsletters, emails, social media and website updates, engagement activities, virtual and in-person events, site tours, media engagement and feedback opportunities.

CNSC staff conclude that regulatory requirements for public information and disclosure associated with OPG are being met through implementation of the OPG PIDP. The continued efforts of OPG will ensure it remains effective for the future, regardless of the licensing period.

5.3.3 Recommendation

The current and proposed licence condition G.4 requires that OPG implement and maintain a public information and disclosure program. Compliance verification criteria for this licence condition is included in the draft LCH.

5.4 Nuclear Liability Insurance

The *Nuclear Liability and Compensation Act* (NLCA), which entered into force on January 1, 2017, requires designated nuclear installations to carry financial security for third party (civil) liability in the event of a nuclear incident as defined under section 2 of the NLCA.

The facility is included as part of the DNGS site, which is designated as a nuclear installation pursuant to section 7 of the NLCA. Item 2 of the Schedule of the *Nuclear Liability and Compensation Regulations* (NLCR) specifies that the DNGS installation includes both the "Four-unit power reactor" and the "Facility for the storage of irradiated fuel", and further identifies the licence holder of the former as the Operator under the NLCA. Therefore, OPG is required to maintain valid insurance for the liability amount defined in those regulations.

5.4.1 Discussion

The Department of Natural Resources oversees the enforcement of the Regulations, and the CNSC, prior to granting a licence to operators, is to ensure that applicants have the required financial security in place to cover their respective liability amount, as established by the NLCA and its Regulations.

The facility, a solid radioactive waste management facility, is one of the facilities at the DNGS subject to the NLCA. The facility is listed in item 2, column 4 in the Schedule of the NLCR. Section 4 of the NLCR describes classes of nuclear installations and ranks the risk of each class. OPG' liability amount for DNGS is prescribed at C$1 billion dollars pursuant to paragraph 24(1)(d) of the NLCA. OPG has provided CNSC staff a certificate of insurance to demonstrate that its liability insurance remains valid.

5.4.2 Conclusion

CNSC staff are satisfied that OPG holds valid liability insurance for the required amount, for the DNGS site, which includes the waste facility. CNSC staff will continue to assist NRCan staff in ensuring OPG's compliance with its obligations under the NLCA.

5.4.3 Recommendation

There are no requirements for any additional licensing activity or any additional licence conditions.

5.5 Licence Conditions Handbook

The primary purpose of the LCH is to identify and clarify the relevant parts of the licensing basis for each licence condition. This helps ensure that the licensee performs the licensed activity in accordance with the licensing basis. The compliance verification criteria provided in the LCH are used by CNSC staff to assess whether the conditions in the licence have been, or are being, met. The LCH provides details associated with each licence condition, such as applicable CNSC regulatory documents and CSA Group standards, regulatory interpretation, compliance verification criteria, version-controlled licensee documents, licensees' written notification requirements and various guidance. This structure allows more freedom for the facility to evolve and update its documentation within the licensing basis. The proposed licence conditions handbook for this proposed licence is provided in part 2 of this CMD.

5.6 Delegation of Authority

The Commission may include in a licence any condition it considers necessary for the purposes of the NSCA. The Commission may delegate authority to CNSC staff with respect to the administration of licence conditions, or portions thereof.

There are 4 proposed licence conditions in the proposed WFOL that contain the phrase "the Commission or a person authorized by the Commission":

- LC 12.2 Construction;
- LC 13.1 Safeguards Program;
- LC 15.1 Construction Plans; and
- LC 15.2 Commissioning Report.

5.6.1 Recommendation

CNSC staff recommend the Commission delegate its authority for the purposes described in the above licence conditions to the following staff:

For LC 12.2, LC 15.1 and LC 15.2:

- Director, Wastes and Decommissioning Division;
- Director General, Directorate of Nuclear Cycle and Facilities Regulations; and,

- Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch.

For LC 13.1:

- Director, International Safeguards Division;
- Director General, Directorate of Security and Safeguards; and,
- Vice-President, Technical Support Branch.

5.7 Name Change of the Facility

In 2021, OPG renamed its Nuclear Waste Management division to Nuclear Sustainability Services. Therefore, OPG has requested that the title Darlington Waste Management Facility be changed to Nuclear Sustainability Services-Darlington (NSS-D) in section IV of the licence.

5.7.1 Discussion

CNSC staff find that this change is administrative and has no impact on the activities authorized in the licence or CNSC regulatory oversight of the waste management facility. In general, CNSC staff accepts the licensees' chosen name for a facility, location, or site.

5.7.2 Conclusion

CNSC staff conclude that the name change from DWMF to NSS-D is acceptable and have included the new name in the draft licence and draft licence conditions handbook as follow:

(i) operate the **Nuclear Sustainability Services-Darlington (herein referred to as "the facility"), a waste management facility** located at the Darlington Nuclear Generating Station, Township of Darlington, Municipality of Clarington, Regional Municipality of Durham, Province of Ontario;

5.8 Name Change of Storage Buildings to Storage Structures

In the licence application, OPG has requested that the name of the two future DSC storage buildings be changed from Used Fuel Dry Storage Buildings (UFDSB) to Used Fuel Dry Storage Structures (UFDSS).

5.8.1 Discussion

A structure is defined in CSA N292.0-19, *General principles for the management of radioactive waste and irradiated fuel* as "passive elements such as buildings, vessels, and shielding." Given this definition and OPGs compliance with this standard, CNSC staff agree that OPG's name change is consistent with regulatory terminology. CNSC staff find that this change is administrative and has no impact on the activities authorized in the licence or CNSC regulatory oversight of the waste management facility. In general, CNSC staff accepts the licensees' chosen name for structures associated with a facility or activity.

5.8.2 Conclusion

CNSC staff conclude that the name change from UFDSB to UFDSS for the two future storage structures is acceptable and have reflected the new terminology in the draft licence and licence conditions handbook as follows:

- (IV) carry out the site preparation, construction, or construction modifications at the facility associated with the authorized additional storage structures, when on completion will result in a total of no more than 2 used fuel dry storage buildings and 2 used fuel dry storage structures, and no more than 1 intermediate level radioactive waste storage building

Furthermore, in licence condition 12.2, CNSC staff change "building" to "structure" as follows:

- **12.2 Construction**

The licensee shall not carry out the activities referred to in paragraph (ii) of Part IV of this licence that relates to completed construction activities in paragraph (iv) of Part IV of this licence until the submission of the proposed security arrangements and measures for the new **structure**, or any potential modifications to the protected area that may be associated with this new **structure**, that is acceptable to the Commission or a person authorized by the Commission.

5.9 Additional Used Fuel Dry Storage Structures

In its licence renewal application, OPG has requested to construct two new UFDSS under the authorization of section IV of the current operating licence with the following changes to the structures:

- Modification to the design
- Increased total storage capacity from 1000 DSCs over two buildings to 1200 DSCs over two buildings

5.9.1 Discussion

Current Authorization

In 2013, the Commission renewed the DWMF waste facility operating licence which included the authorization for OPG to carry out the site preparation and construction for three additional UFDSBs. This authorization was issued on the basis that the design of the three UFDSBs would be the same as the existing UFDSB#1 design outlined in OPG's Safety Report. Licence conditions were included in the 2013 licence WFOL-W4-355.00/2023 [10] for these additional UFDSBs as follows:

2.1 The licensee shall submit an environmental management plan and a construction verification plan prior to the commencement of construction activities described in paragraph d) of Part IV of this licence.

2.2 The licensee shall submit the project design requirements prior to the commencement of construction activities described in paragraph d) of Part IV of this licence.

2.3 The licensee shall not carry out the activities referred to in paragraph b) of Part IV of this licence that relate to completed construction activities in paragraph d) of Part IV of this licence until the submission of a commissioning report that is acceptable to the Commission, or a person authorized by the Commission.

14.2 The licensee shall not carry out the activities referred to in paragraph b) of Part IV of this licence that relate to completed construction activities in paragraph d) of Part IV of this licence until the submission of the proposed security arrangements and measures for the new building, or any potential modifications to the protected area that may be associated with this new building, that is acceptable to the Commission or a person authorized by the Commission.

In February 2015, the Commission amended the DWMF operating licence which included the modification of the licence conditions for new storage buildings to align with the standardized licence format. The licence conditions for the additional USFDBs are as follows:

- **12.2 Construction**

  The licensee shall not carry out the activities referred to in paragraph (ii) of Part IV of this licence that relates to completed construction activities in paragraph (iv) of Part IV of this licence until the submission of the proposed security arrangements and measures for the new structure, or any potential modifications to the protected area that may be associated with this new structure, that is acceptable to the Commission or a person authorized by the Commission.

- **15.1 Construction Plans**

  The licensee shall submit an environmental management plan, a construction verification plan, and the project design requirements prior to the commencement of construction activities described in paragraph (iv) of Par IV of this licence.

- **15.2 Commissioning Report**

  The licensee shall not carry out the activities referred to in paragraph (ii) of Part IV of this licence that relate to completed construction activities in paragraph (iv) of Part IV of this licence until the submission of a commissioning report that is acceptable to the Commission, or a person authorized by the Commission.

In 2016, CNSC staff assessed the commissioning report submitted by OPG for UFDSB#2 and concluded that its construction and commissioning aligned with the safety and design basis. CNSC staff authorized the operation of UFDSB#2 under licence condition 15.2 in 2016.

Proposed change

In its licence application, OPG stated its plan to increase the nominal storage capacity and to change the design of the future UFDSS #3 and #4.

OPG plan to increase the total storage capacity for UFDSS #3 and #4 from 1000 DSCs to 1200. OPG stated the following justification for the increase in storage capacity:

- based on the annual processing rates of approximately 60 DSCs per year and with consideration of the Darlington Refurbishment Project, there is a need for an additional storage capacity of approximately 1,200 DSCs.
- the construction of UFDSS #3 and #4 that has the capacity to store 1,200 DSCs, will be adequate DSC storage capacity until 2043.

Furthermore, OPG stated in its application that UFDSS#3 and #4 will incorporate changes to the design of the structures. For example, the revised design may be a non-shielded structure on a concrete slab capable of supporting the distributed weight of the DSCs.

At the time of CNSC staff's assessment, the designs for UFDSS#3 and #4 were not completed. However, OPG stated that the new storage structures will meet regulatory requirements and provided the following with respect to the design of the two storage structures:

- Safety Analysis – OPG will submit to the CNSC, a preliminary safety analysis report, demonstrating compliance with these targets for UFDSS#3 and UFDSS#4 at least 270 days (9 months) prior to the submission of the commissioning reports for the storage structures.
- Physical Design - The design of the storage structures will comply with the NFCC, NBCC and CSA Standard N393 (versions in the LCH at the time of design). The designs will include provisions necessary to accommodate approximately 600 DSCs each in a non-shielded structure with a concrete slab capable of supporting the distributed weight of the DSCs. The site infrastructure will allow for the safe movement and transfer of the DSCs using a DSC Transporter. Movement of the DSC will be from the DSC Processing Building to these storage structures. Design and design characteristics of the structure will be submitted to the CSNC within 30 days prior to the start of construction (existing Licence Condition 15.1).
- Emergency Management and Fire Protection – The design and operation of the storage structures will be in accordance with CSA standard N393, the NBCC and the NFCC.
- Environmental Protection - OPG will meet the regulatory annual dose limit of 1 mSv for the public and 50 mSv for a NEW. OPG dose targets of 10 µSv in a year for the public at the site boundary and 0.5 µSv/h for non-NEWs at the "non-NEW" boundary will be met for the storage structures. The preliminary safety analysis report, which will include the dose to public for the storage structures, will be provided to the CNSC at least 270 days (9 months) prior to the submission of the commissioning reports. It is anticipated that there will be no changes in environmental monitoring of air or water emissions. Perimeter dose monitoring will be carried out for the storage structures.

CNSC staff specified in a letter to OPG [11], and as stated in section 3.5.3.3 of this CMD that OPG will have to ensure that the new storage structures and modifications to the existing buildings meet the requirements set in the 2020 published version of the NBCC.

5.9.2 Conclusion

CNSC staff assessed all available information relating to OPG's request to construct the two additional UFDSS with an increased nominal capacity of 1200 DSCs and a modified design under the authorization in the current licence. Due to the changes in the design, CNSC staff recommend that licence condition 15.1 be modified to include the submission of a preliminary safety analysis prior to the construction of the storage buildings. This preliminary safety analysis must evaluate all design changes to the storage structures and ensure that the design includes effective preventative measures and strategies to address all potential hazards. Furthermore, CNSC staff recommend that licence condition 15.1 be modified so that the Commission or a person authorized by the Commission must accept the submissions outlined in the condition prior to the commencement of the construction of the storage structures. In addition, CNSC staff recommend that licence condition 12.2 and 15.2 remain in the licence unchanged except only for the name change of the storage facilities.

CNSC staff conclude that licence conditions 12.2, 15.1 and 15.2 will allow CNSC staff to determine whether the design of the storage structures remains within the licensing basis and meets regulatory requirements prior to authorizing construction and operation of the new storage structures. If CNSC staff determine that the design of either of the storage structures does not remain within the licensing basis, the authorization of the construction and operation of the storage structures will be the Commission's decision.

5.9.3 Recommendation

CNSC staff recommend to change the existing licence condition 15.1 to require formal acceptance from the Commission or a person authorized by the Commission and to include the submission of a preliminary safety analysis report as follows:

- **15.1 Construction Plans**

The licensee shall not carry out the activities referred to in paragraph (iv) of Part IV of this licence until the submission of an environmental management plan, a construction verification plan, the project design requirements and preliminary safety analysis report that are acceptable to the Commission or a person authorized by the Commission.

6. OVERALL CONCLUSIONS AND RECOMMENDATIONS

CNSC staff's conclusions and recommendations consider an overall assessment of OPG's compliance with the NSCA and its Regulations during the previous licence period (2012-2022). CNSC staff's assessment determined that the application complies with regulatory requirements. As reported to the Commission each year in CNSC staff's Regulatory Oversight Report for Nuclear Power Generating Stations, OPG's performance during the current licensing term was satisfactory and met regulatory requirements.

CNSC staff conclude that OPG has programs, resources, and measures in place at the facility to ensure the health and safety of persons and the environment and to ensure appropriate measures related to security and Canada's international obligations during the proposed licence period.

Based on above conclusions, CNSC staff recommend that the Commission take the following actions:

1. Conclude, pursuant to paragraphs 24(4)(a) and (b) of the Nuclear Safety and Control Act in that the licensee:
    i. Is qualified to carry on the activity that the licence will authorize the licensee to carry on; and
    ii. Will, in carrying on that activity, 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.
2. Renew the proposed 10-year waste facility operating licence until April 30, 2033. With the updated Licence Condition 15, and;
3. Delegate authority as set out in section 5.6 of this CMD.

REFERENCES

[1] OPG Letter from Van Mart J. to Leblanc M., "Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023" December 16, 2021, E-Doc 6720745.

[2] CNSC Type II Inspection report: OPG-DWMF-2018-01 Type II Compliance Inspection at Darlington Waste Management Facility, June 14, 2018, E-Doc 5528265

[3] OPG Letter from McGee B. to Doughty P., "Darlington Waste Management Facility Construction Notification for Dry Storage Container Storage Building #2" March 14, 2014, E-Doc 4402555.

[4] OPG Letter from Swami L. to Thompson S., "Commissioning Report for Darlington Used Fuel Dry Storage Building #2" March 03, 2016, E-Doc 4955657.

[5] CNSC Letter from Thompson S.to Howe D., "Completion Status of Commissioning Report Open Items for Darlington Used Fuel Dry Storage Building #2" November 10, 2016, E-Doc 5120638.

[6] OPG Letter from Swami L. to Thompson S., "Darlington Waste Management Facility Construction Notification for Retube Waste Storage Building" November 5, 2014, E-Doc 4575199.

[7] Record of Acceptance, "Request for Acceptance of the Retube Waste Storage Building Commissioning Reports" November 21, 2017, E-Doc 5393635.

[8] OPG Letter from Lo A. to Fortier É., "CNSC Staff's Prior Written Notification of Document Changes: 00044-SR-01320-10002, Darlington Waste Management Facility Safety Report, R004" November 11, 2021, E-Doc 6679777.

[9] OPG Letter from Ferguson H. to Viktorov A., Riendeau N. & Glenn K., "Gap Analysis and Implementation Plan for Compliance with CSA Standard N288.7-15" December 14, 2017, E-Doc 5420088.

[10] CNSC Licence, "Waste Facility Operating Licence Darlington Waste Management Facility WFOL-W4-355.00/2023", March 13, 2013, E-Doc 4003676.

[11] CNSC Letter from Fortier É. to Van Mart J., "CNSC staff review of OPG's response to CNSC staff review of Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023" September 28, 2022, E-Doc 6874578.

[12] CNSC CMD 22-H104, "Ontario Power Generation Inc.'s Consolidated Financial Guarantee", August 16, 2022, E-Doc 6811500

GLOSSARY

For definitions of terms used in this document, see *REGDOC-3.6, Glossary of CNSC Terminology*, which includes terms and definitions used in the *Nuclear Safety and Control Act* and the Regulations made under it, and in CNSC regulatory documents and other publications.

Additional terms and acronyms used in this CMD are listed below.

AIA	Authorized Inspection Agency
ALARA	As Low As Reasonably Achievable
CCR	Code Compliance Review
CINFR	*Class I Nuclear Facilities Regulations*
CNSC	Canadian Nuclear Safety Commission
CMD	Commission Member Document
CEA	Cyber Essential Assets
CRFR	*Cost Recovery Fees Regulations*
CSA	Canadian Standards Association
DN	Darlington Nuclear
DNGS	Darlington Nuclear Generating Station
DSC	Dry Storage Container
DSO	Darlington Storage Overpack
DWMF	Darlington Waste Management Facility
EA	Environmental Assessment
EHS	Environment, Health and Safety
EMS	Environment Management System
EPR	Environmental Protection Review
ERA	Environmental Risk Assessment
ERT	Emergency Response Team
FG	Financial Guarantee
FHA	Fire Hazards Assessment
FPP	Fire Protection program
FRC	Funding Review Committee
FS	Fully Satisfactory
GNSCR	*General Nuclear Safety and Control Regulations*
IAA	Impact Assessment Act
IAEA	International Atomic Energy Agency
IEMP	Independent Environmental Monitoring Program

LCH	Licence Conditions Handbook
LTI	Lost-time injury
NBCC	National Building Code of Canada
NEW	Nuclear Energy Worker
NFCC	National Fire Code of Canada
NLCA	*Nuclear Liability and Compensation Act*
NLCR	*Nuclear Liability and Compensation Regulations*
NNC	Notice of non-compliance
NSCA	*Nuclear Safety and Control Act*
NSR	*Nuclear Security Regulations*
NSS-D	Nuclear Sustainability Services - Darlington
OPG	Ontario Power Generation
PDP	Preliminary Decommissioning Plan
PIDP	Public Information and Disclosure Program
PTNSR	*Packaging and Transport of Nuclear Substances Regulation*, 2015
RP	Radiation Protection
RWC	Retube Waste Container
RWSB	Retube Waste Storage Building
SA	Satisfactory
SAR	Safety Analysis Report
SAT	Systematic Approach to Training
SCA	Safety and Control Area
SpA	Specific Area
SSC	Systems, Structures and Components
TLD	Thermoluminescent Dosimeter
TDG	*Transportation of Dangerous Goods*
UFDSB	Used Fuel Dry Storage Building
UFDSS	Used Fuel Dry Storage Structure
WFOL	Waste Facility Operating Licence

A. SAFETY PERFORMANCE RATING LEVELS

Satisfactory (SA)

Licensee meets all of the following criteria:

- Performance meets CNSC staff expectations
- Licensee non-compliances or performance issues, if any, are not risk-significant
- Any non-compliances or performance issues have been, or are being, adequately corrected

Below Expectations (BE)

One or more of the following criteria apply:

- Performance does not meet CNSC staff expectations
- Licensee has risk-significant non-compliance(s) or performance issue(s)
- Non-compliances or performance issues are not being adequately corrected

Unacceptable (UA)

One or both of the following criteria apply:

- Risk associated with a non-compliance or performance issue is unreasonable
- At least one significant non-compliance or performance issue exists with no associated corrective action

B. BASIS FOR THE RECOMMENDATION(S)

B.1 Regulatory Basis

The recommendations presented in this CMD are based on compliance objectives and expectations associated with the relevant SCAs and other matters. The regulatory basis for the matters that are relevant to this CMD are as follows.

Management System

The regulatory foundation for the recommendation(s) associated with Management System includes the following:

- The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain, under paragraph:
  - 3(d), the proposed management system for the activity to be licensed, including measures to promote and support safety culture.
- The *General Nuclear Safety and Control Regulations* require that an application for a licence shall contain, under paragraphs:
  - 3(1)(*k*), the applicant's organizational management structure insofar as it may bear on the applicant's compliance with the NSCA and the regulations made under the NSCA, including the internal allocation of functions, responsibilities and authority.
  - 15(*a*), the persons who have the authority to act for them (the applicant/licensee) in their dealings with the Commission.
  - 15(*b*), the names and position titles of the persons who are responsible for the management and control of the licensed activity and the nuclear substance, nuclear facility, prescribed equipment or prescribed information encompassed by the licence.

Human Performance Management

The regulatory foundation for the recommendation(s) associated with Human Performance Management includes the following:

- The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain, under paragraphs:
  - 3(d.1), the proposed human performance program for the activity to be licensed, including measures to ensure workers' fitness for duty.
  - 6(*m*), the proposed responsibilities of and the qualification requirements and training program for workers, including the procedures for the requalification of workers
  - 6(*n*), the results that have been achieved in implementing the program for recruiting, training and qualifying workers in respect of the operation and maintenance of the nuclear facility.
- The *General Nuclear Safety and Control Regulations* require that licensees, under paragraphs:

- 12(1)(*a*), ensure the presence of a sufficient number of qualified workers to carry on the licensed activity safely and in accordance with the Act, the regulations made under the Act and the licence.
- 12(1)(*b*), train the workers to carry on the licensed activity in accordance with the Act, the regulations made under the Act and the licence.
- 12(1)(*e*), require that every person at the site of the licensed activity to use equipment, devices, clothing and procedures in accordance with the Act, the regulations made under the Act and the licence.

Operating Performance

The regulatory foundation for the recommendation(s) associated with operating performance includes the following:

- The *Class I Nuclear Facilities Regulations* require that an application for a licence to operate a Class I nuclear facility shall contain, under paragraph:
  - 6(*d*), the proposed measures, policies, methods and procedures for operating and maintaining the nuclear facility.

Safety Analysis

The regulatory foundation for the recommendation(s) associated with safety analysis includes the following:

- The *General Nuclear Safety and Control Regulations* require that an application for a licence shall contain, under paragraph:
  - 3(1)(*i*), a description and the results of any test, analysis or calculation performed to substantiate the information included in the application.
- The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain, under paragraphs:
  - 6(*c*), a final safety analysis report demonstrating the adequacy of the design of the nuclear facility.
  - 6(*h*), the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measures that will be taken to prevent or mitigate those effects.

Physical Design

The regulatory foundation for the recommendation(s) associated with physical design includes the following:

- Paragraph 3(1)(*d*) of the *General Nuclear Safety and Control Regulations* requires that an application for a licence shall contain a description of any nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence.
- The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain, under paragraphs:
  - 3(*a*), a description of the site of the activity to be licensed, including the location of any exclusion zone and any structures within that zone;
  - 3(*b*), plans showing the location, perimeter, areas, structures and systems of the nuclear facility;
  - 6(*a*), a description of the structures at the nuclear facility, including their design and their design operating conditions;
  - 6(*b*), a description of the systems and equipment at the nuclear facility, including their design and their design operating conditions;
  - 6(*c*), a final safety analysis report demonstrating the adequacy of the design of the facility; and
  - 6(*d*), proposed measures, policies, methods and procedures for operating and maintaining the facility.

Fitness for Service

The regulatory foundation for the recommendation(s) associated with fitness for service includes the following:

- The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain, under paragraph:
  - 6(*d*), the proposed measures, policies, methods and procedures for operating and maintaining the nuclear facility.

Radiation Protection

The regulatory foundation for the recommendation(s) associated with radiation protection includes the following:

- The *General Nuclear Safety and Control Regulations* require, under subsection 3(1), that a licence application contain the following information under paragraphs:
  - 3(1)(*e*), the proposed measures to ensure compliance with the *Radiation Protection Regulations*.
  - 3(1)(*f*), any proposed action level for the purpose of section 6 of the *Radiation Protection Regulations*.
- The *Radiation Protection Regulations*
- The *Class I Nuclear Facilities Regulations* require that an application for a licence to operate a Class I nuclear facility shall contain, under paragraphs:

- 6(*e*), the proposed procedures for handling, storing, loading and transporting nuclear substances and hazardous substances.
- 6(*h*), the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measure that will be taken to prevent or mitigate those effects.

Conventional Health and Safety

The regulatory foundation for the recommendation(s) associated with Conventional Health and Safety includes the following:

- The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain, under paragraph:
  - 3(*f*), the proposed worker health and safety policies and procedures.
- OPG's activities and operations must comply with the *Occupational Health and Safety Act of Ontario and the Labour Relations Act*.

Environmental Protection

The regulatory foundation for the recommendation(s) associated with Environmental Protection includes the following:

- The *General Nuclear Safety and Control Regulations*, under paragraphs 12(1)(c) and (f), require that each licensee take all reasonable precautions to protect the environment and the health and safety of persons, and to control the release of radioactive nuclear substances and hazardous substances within the site of the licensed activity and into the environment.
- The *Radiation Protection Regulations* prescribe dose limits for the general public, which under Subsection 1(3) is 1 mSv per calendar year.
- The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain, under paragraphs:
  - 3(*e*), the name, form, characteristics and quantity of any hazardous substances that may be on the site while the activity to be licensed is carried on.
  - 3(*g*), the proposed environmental protection policies and procedures.
  - 3(*h*), the proposed effluent and environmental monitoring programs.
  - 6(*e*), the proposed procedures for handling, storing, loading and transporting nuclear substances and hazardous substances.
  - 6(*h*), the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measures that will be taken to prevent or mitigate those effects.

- 6*(i)*, the proposed location of points of release, the proposed maximum quantities and concentrations, and the anticipated volume and flow rate of releases of nuclear substances and hazardous substances into the environment, including their physical, chemical and radiological characteristics.
- 6*(j)*, the proposed measures to control releases of nuclear substances and hazardous substances into the environment.

Emergency Management and Fire Protection

The regulatory foundation for the recommendation(s) associated with Emergency Management and Response includes the following:

- 12(1)(c) of the *General Nuclear Safety and Control Regulations* states that every licensee shall "take all reasonable precautions to protect the environment and the health and safety of persons and to maintain security".
- 12(1)(f) of the *General Nuclear Safety and Control Regulations* states that every licensee shall "take all reasonable precautions to control the release of radioactive nuclear substances or hazardous substances within the site of the licensed activity and into the environment of the licensed activity".
- The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain, under paragraph:
  - 6(*k*) information on the licensee's proposed measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances on the environment, the health and safety of persons and the maintenance of national security, including measures to:
    - Assist offsite authorities in planning and preparing to limit the effects of an accidental release;
    - Notify offsite authorities of an accidental release or the imminence of an accidental release;
    - Report information to offsite authorities during and after an accidental release;
    - Assist offsite authorities in dealing with the effects of an accidental release; and
    - Test the implementation of the measures to prevent or mitigate the effects of an accidental release.

Waste Management

The regulatory foundation for the recommendation(s) associated with Waste Management includes the following:

- The *General Nuclear Safety and Control Regulations* require that an application for a licence include, under paragraph:
  - 3(1)(*j*), the name, quantity, form and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including waste that may be stored, managed, processed, or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste.

Security

The regulatory foundation for the recommendation(s) associated with Security includes the following:

- The *Nuclear Security Regulations* (NSR). It is a requirement of all Class I licensees to comply with the NSR.
- Specific obligations of the GNSCR that distinctly encompass the security SCA include:
  - Paragraph 12(1)(c), *Every licensee shall take all reasonable precautions to protect the environment and the health and safety of persons and to maintain the security of nuclear facilities and of nuclear substances;*
  - Paragraph 12(1)(g), *Every licensee shall implement measures for alerting the licensee to the illegal use or removal of a nuclear substance, prescribed equipment or prescribed information, or the illegal use of a nuclear facility;*
  - Paragraph 12(1)(h), *Every licensee shall implement measures for alerting the licensee to acts of sabotage or attempted sabotage anywhere at the site of the licensed activity;* and
  - Paragraph 12(1)(j), *Every licensee shall instruct the workers on the physical security program at the site of the licensed activity and on their obligations under that program.*

Safeguards and Non-Proliferation

The regulatory foundation for the recommendation(s) associated with Safeguards and Non-Proliferation includes the following:

- It is a requirement of the *General Nuclear Safety and Control Regulations* under paragraph 12(1)(i) that each licensee take all necessary measures to facilitate Canada's compliance with any applicable safeguards agreement, where the applicable agreements are:
  - The Agreement between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons.
  - The Protocol Additional to the Agreement between Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons.

Packaging and Transport

The regulatory foundation for the recommendation(s) associated with Packaging and Transport includes the following:

- The *Packaging and Transport of Nuclear Substances Regulations, 2015*; and
- Transport Canada's *Transportation of Dangerous Goods Regulations*.

Decommissioning Strategy and Financial Guarantees

The regulatory foundation for the recommendation(s) associated with OPG's Decommissioning Strategy and Financial Guarantees includes:

- The *General Nuclear Safety and Control Regulations* require that an application for a licence shall contain, under paragraph:
  - 3(1)(*l*), a description of any proposed financial guarantee relating to the activity to be licensed.
- The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain, under paragraph:
  - 3(*k*), the proposed plan for the decommissioning of the nuclear facility or of the site.

Licensee's Public Information Program

- The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain, under paragraph:
  - 3(*j*), information on the licensee's public information program.

B.2 Detailed Summary of CNSC Assessment of Application

CNSC staff's assessment of DWMF's licence application included a completeness check, a sufficiency check, and a technical assessment against regulatory requirements. The completeness check verified whether the application included the prescribed information in accordance with the *Nuclear Safety and Control Act* and its Regulations. The sufficiency check verified whether the application included sufficient and quality information in order for CNSC staff to conduct the technical assessment. The technical assessment verified whether the application included adequate safety and control measures to address CNSC requirements. Documents originally submitted as part of the application may have been revised, updated or replaced over the course of the assessment in order to address CNSC requirements. Additional information and clarifications on the application and supporting documents provided by OPG are considered part of the application.

Pursuant to Section 3 of the *General Nuclear Safety and Control Regulations* Licences – General Application Requirements	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
(1) An application for a licence shall contain the following information:				
(a) the applicant's name and business address;	Application, attachment 2	Y	Y	Y
(b) the activity to be licensed and its purpose;	Application, Cover letter	Y	Y	Y

Pursuant to Section 3 of the *General Nuclear Safety and Control Regulations* Licences – General Application Requirements	Location in Application or Supporting Document(s) as Noted by OPG	Complete?	Sufficient?	Adequate?
(c) the name, maximum quantity and form of any nuclear substance to be encompassed by the licence;	Application, Attachment 5, section 1.5 And "OPG Response to CNSC Staff Review of Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023"	Y	Y	Y
(d) a description of any nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence;	Application, Attachment 5, sections 1.0 & 2.12 And "OPG Response to CNSC Staff Review of Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023"	Y	Y	Y
(e) the proposed measures to ensure compliance with the *Radiation Protection Regulations*, the *Nuclear Security Regulations* and the *Packaging and Transport of Nuclear Substances Regulations, 2015;*	Application, Attachment 5, sections 2.7, 2.12 & 2.14 And "OPG Response to CNSC Staff Review of Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023"	Y	Y	Y
(f) any proposed action level for the purpose of section 6 of the *Radiation Protection Regulations*;	Application, Attachment 5, sections 2.7 & 2.9	Y	Y	Y
(g) the proposed measures to control access to the site of the activity to be licensed and the nuclear substance, prescribed equipment or prescribed information;	Application, Attachment 5, section 2.12	Y	Y	Y
(h) the proposed measures to prevent loss or illegal use, possession or removal of the nuclear substance, prescribed equipment or prescribed information;	Application, Attachment 5, sections 2.12 & 2.13	Y	Y	Y

Pursuant to Section 3 of the *General Nuclear Safety and Control Regulations* Licences – General Application Requirements	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
(i) a description and the results of any test, analysis or calculation performed to substantiate the information included in the application;	Application, Attachment 5, sections 2.1 to 2.14	Y	Y	Y
(j) the name, quantity, form, origin and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including waste that may be stored, managed, processed or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste;	Application, Attachment 5, sections 1.5, 1.6, & 2.11	Y	Y	Y
(k) the applicant's organizational management structure insofar as it may bear on the applicant's compliance with the *Act* and the regulations made under the *Act*, including the internal allocation of functions, responsibilities and authority;	Application, Attachment 5, section 2.1 Attachment 9 And "OPG Response to CNSC Staff Review of Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023"	Y	Y	Y
(l) a description of any proposed financial guarantee relating to the activity to be licensed; and	Application, Attachment 5, section 6.0	Y	Y	Y
(m) any other information required by the *Act* or the regulations made under the *Act* for the activity to be licensed and the nuclear substance, nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence.	Application, Attachment 5, sections 2.1 to 2.14	Y	Y	Y

Pursuant to Subsection 3(1.1) of the *General Nuclear Safety and Control Regulations* Other Information Requested by CNSC Staff	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
(1.1) The Commission or a designated officer authorized under paragraph 37(2)(c) of the *Act* may require any other information that is necessary to enable the Commission or the designated officer to determine whether the applicant: (a) is qualified to carry on the activity to be licensed; or (b) will, in carrying on that activity, 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.	As required, see application, attachment 3 And "OPG Response to CNSC Staff Review of Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023"	Y	Y	Y

Pursuant to Section 5 of the *General Nuclear Safety and Control Regulations* Obligations – Representatives of Applicants and Licensees	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
5 An application for the renewal of a licence shall contain:				
(a) the information required to be contained in an application for that licence by the applicable regulations made under the Act; and	Application, Attachment 1 to 9 And "OPG Response to CNSC Staff Review of Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023"	Y	Y	Y

Pursuant to Section 5 of the *General Nuclear Safety and Control Regulations* Obligations – Representatives of Applicants and Licensees	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
(b) A statement identifying the changes in the information that was previously submitted.	Application, Attachment 4	Y	Y	Y

Pursuant to Section 15 of the *General Nuclear Safety and Control Regulations* Obligations – Representatives of Applicants and Licensees	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
15 Every applicant for a licence and every licensee shall notify the Commission of:				
(a) the persons who have authority to act for them in their dealings with the Commission;	Application, Attachment 5 section 2.1 Attachment 9	Y	Y	Y
(b) the names and position titles of the persons who are responsible for the management and control of the licensed activity and the nuclear substance, nuclear facility, prescribed equipment or prescribed information encompassed by the licence; and	Application, Attachment 5 section 2.1 Attachment 9 And "OPG Response to CNSC Staff Review of Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023"	Y	Y	Y
(c) any change in the information referred to in paragraphs (a) and (b), within 15 days after the change occurs.	Application, Attachment 5 section 2.1 Attachment 9	Y	Y	Y

Pursuant to Section 3 of the *Class I Nuclear Facilities Regulations* Licence Applications – General Requirements	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
3 An application for a licence in respect of a Class I nuclear facility, other than a licence to abandon, shall contain the following information in addition to the information required by				

Pursuant to Section 3 of the *Class I Nuclear Facilities Regulations* Licence Applications – General Requirements	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
Section 3 of the *General Nuclear Safety and Control Regulations*:				
(a) a description of the site of the activity to be licensed, including the location of any exclusion zone and any structures within that zone;	Application, Attachment 5 section 1.0	Y	Y	Y
(b) plans showing the location, perimeter, areas, structures and systems of the nuclear facility;	Application, Attachment 5 section 1.2	Y	Y	Y
(c) evidence that the applicant is the owner of the site or has authority from the owner of the site to carry on the activity to be licensed;	Application, Attachment 8	Y	Y	Y
(d) the proposed management system for the activity to be licensed, including measures to promote and support safety culture;	Attachment 5 - Section 2.1	Y	Y	Y
(d.1) the proposed human performance program for the activity to be licensed, including measures to ensure workers' fitness for duty;	Attachment 5 - Section 2.2	Y	Y	Y
(e) the name, form, characteristics and quantity of any hazardous substances that may be on the site while the activity to be licensed is carried on;	Attachment 5 - Section 1.3, 1.4, 1.5 & 1.6	Y	Y	Y
(f) the proposed worker health and safety policies and procedures;	Attachment 5 - Section 2.7 & 2.8	Y	Y	Y
(g) the proposed environmental protection policies and procedures;	Attachment 5 - Section 2.9	Y	Y	Y
(h) the proposed effluent and environmental monitoring programs;	Attachment 5 - Section 2.9	Y	Y	Y

Pursuant to Section 3 of the *Class I Nuclear Facilities Regulations* Licence Applications – General Requirements	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
(i) if the application is in respect of a nuclear facility referred to in paragraph 2(*b*) of the *Nuclear Security Regulations*, the information required by section 3 of those Regulations;	Attachment 5 - Section 2.12	Y	Y	Y
(j) 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; and	Attachment 5 - Section 4.0 & 5.0	Y	Y	Y
(k) the proposed plan for the decommissioning of the nuclear facility or of the site.	Attachment 5 - Section 2.11	Y	Y	Y

Pursuant to Section 6 of the *Class I Nuclear Facilities Regulations* Licence Applications – Licence to Operate	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
6 An application for a licence to operate a Class I nuclear facility shall contain the following information in addition to the information required by section 3:				
(a) a description of the structures at the nuclear facility, including their design and their design operating conditions;	Attachment 5 - Sections 1.0 & 2.3	Y	Y	Y
(b) a description of the systems and equipment at the nuclear facility, including their design and their design operating conditions;	Attachment 5 - Sections 1.0 & 2.5	Y	Y	Y

Pursuant to Section 6 of the *Class I Nuclear Facilities Regulations* Licence Applications – Licence to Operate	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
(c) a final safety analysis report demonstrating the adequacy of the design of the nuclear facility;	Attachment 5 - Section 2.4	Y	Y	Y
(d) the proposed measures, policies, methods and procedures for operating and maintaining the nuclear facility;	Attachment 5 - Section 2.3	Y	Y	Y
(e) the proposed procedures for handling, storing, loading and transporting nuclear substances and hazardous substances;	Attachment 5 - Sections 2.7 & 2.14	Y	Y	Y
(f) the proposed measures to facilitate Canada's compliance with any applicable safeguards agreement;	Attachment 5 - Section 2.13 And "OPG Response to CNSC Staff Review of Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023"	Y	Y	Y
(g) the proposed commissioning program for the systems and equipment that will be used at the nuclear facility;	Attachment 5 - Section 2.5	Y	Y	Y
(h) the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measures that will be taken to prevent or mitigate those effects;	Attachment 5 - Sections 2.9, 3.1 & 3.2	Y	Y	Y

Pursuant to Section 6 of the *Class I Nuclear Facilities Regulations* Licence Applications – Licence to Operate	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
(i) the proposed location of points of release, the proposed maximum quantities and concentrations, and the anticipated volume and flow rate of releases of nuclear substances and hazardous substances into the environment, including their physical, chemical and radiological characteristics;	Attachment 5 - Sections 2.9, 3.1 & 3.2	Y	Y	Y
(j) the proposed measures to control releases of nuclear substances and hazardous substances into the environment;	Attachment 5 - Sections 2.7, 2.9, 3.1 & 3.2	Y	Y	Y

Pursuant to Section 6 of the *Class I Nuclear Facilities Regulations* Licence Applications – Licence to Operate	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
(k) the proposed measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances on the environment, the health and safety of persons and the maintenance of national security, including measures to: (i) assist . offsite authorities in planning and preparing to limit the effects of an accidental release; (ii) notify . offsite authorities of an accidental release or the imminence of an accidental release; (iii) report information to . offsite authorities during and after an accidental release; (iv) assist . offsite authorities in dealing with the effects of an accidental release; and (v) test the implementation of the measures to prevent or mitigate the effects of an accidental release.	Attachment 5 - Section 2.10	Y	Y	Y
(l) the proposed measures to prevent acts of sabotage or attempted sabotage at the nuclear facility, including measures to alert the licensee to such acts;	Attachment 5 - Section 2.12	Y	Y	Y
(m) the proposed responsibilities of and qualification requirements and training program for workers, including the procedures for the requalification of workers; and	Attachment 5 - Section 2.2 And "OPG Response to CNSC Staff Review of Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023"	Y	Y	Y

Pursuant to Section 6 of the *Class I Nuclear Facilities Regulations* Licence Applications – Licence to Operate	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
(n) the results that have been achieved in implementing the program for recruiting, training and qualifying workers in respect of the operation and maintenance of the nuclear facility.	Attachment 5 - Section 2.2 And "OPG Response to CNSC Staff Review of Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence WFOL-W4-355.01/2023"	Y	Y	Y

Pursuant to Part 2 of the *Nuclear Security Regulations*: PART 2 SECURITY OF NUCLEAR FACILITIES LISTED IN SCHEDULE 2 – LICENCE APPLICATIONS	**Location in Application or Supporting Document(s) as Noted by OPG**	**Complete?**	**Sufficient?**	**Adequate?**
41 An application for a licence in respect of a nuclear facility shall contain, in addition to the information required by sections 3 to 8 of the *Class I Nuclear Facilities Regulations*, a description of the physical protection measures to be taken to ensure compliance with sections 42 to 48.	Attachment 5 - Section 2.12	Y	Y	Y

B.3 Technical Basis

The technical basis for the recommendations presented in this CMD is addressed in detail in the table below.

DWMF - Applicable Standards and Codes per Safety and Control Area

SCA	Document Title	Sufficient?	Adequate?
Management System	CSA N286-12 (reaffirmed 2017): *Management System Requirements for Nuclear Facilities*	Y	Y
	CNSC REGDOC-2.1.2 (2018): *Safety Culture*	Y	Y
Human Performance Management	CNSC REGDOC-2.2.2 (2016): *Personnel Training, Version 2*	Y	Y
	CNSC REGDOC-2.2.4 (2017): *Fitness for Duty: Managing Worker Fatigue*	Y	Y
	CNSC REGDOC-2.2.4 (2021): *Fitness for Duty, Volume II: Managing Alcohol and Drug Use, version 3*	Y	Y
	CNSC REGDOC-2.1.2 (2018): *Safety Culture*	Y	Y
Operating Performance	CNSC REGDOC-3.1.2 (2018): *Reporting Requirements, Volume I: Non-Power Reactor Class I Facilities and Uranium Mines and Mills*	Y	Y
	CNSC REGDOC-3.2.1 (2018): *Public Information and Disclosure*	Y	Y
Safety Analysis	CSA N292.0 (2019): *General Principles for the Management of Radioactive Waste and Irradiated Fuel*	Y	Y
	CSA N292.2 (2013): *Interim dry storage of irradiated fuel*	Y	Y
	CSA N292.3 (2014): *Management of Low- and Intermediate –level Radioactive Waste*	Y	Y
	CSA N286.7 (2016): *Quality assurance of analytical, scientific, and design computer programs*	Y	Y
Physical Design	CSA N393-13 (R2018): *Fire protection for facilities that process, handle, or store nuclear substances*	Y	Y
	NRCC 56190 (2010 & 2015): *National Building Code of Canada*	Y	Y
	NRCC 56192 (2010 & 2015): *National Fire Code of Canada*	Y	Y
Fitness for Service	CNSC REGDOC-2.6.3 (2014): *Aging Management*	Y	Y

SCA	Document Title	Sufficient?	Adequate?
Conventional Health and Safety	CNSC REGDOC-2.8.1 (2019): *Conventional Health and Safety*	Y	Y
Environmental Protection	CSA N288.1 (R2014): *Guidelines for Calculating Derived Release Limits for Radioactive Material in Airborne and Liquid Effluents for Normal Operation of Nuclear Facilities*	Y	Y
	CSA N288.4 (R2015): *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*	Y	Y
	CSA N288.5 (R2016): *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*	Y	Y
	CSA N288.6 (R2017): *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills*	Y	Y
	CSA N288.8 (2017): *Establishing and implementing action levels for releases to the environment from nuclear facilities*	Y	Y
	CNSC REGDOC-2.9.1 (2017): *Environmental Principles, Assessments and Protection Measures Version 1.1*	Y	Y
	CSA N288.3.4 (2013): *Performance testing of nuclear air-cleaning systems at nuclear facilities*	Y	Y
	CSA N288.8 (2017): *Performance testing of nuclear air-cleaning systems at nuclear facilities*	Y	Y
Emergency Management and Fire Protection	CNSC REGDOC-2.10.1 (2016): *Nuclear Emergency Preparedness and Response*	Y	Y
	CSA N393-13 (R2018): *Fire Protection for facilities that process, handle or store nuclear substances*	Y	Y
	NRCC 56190 (2010 & 2015): *National Building Code of Canada*	Y	Y
	NRCC 56192 (2010 &2015): *National Fire Code of Canada*	Y	Y
Waste Management	CSA N292.0- (2019): *General Principles for the Management of Radioactive Waste and Irradiated Fuel*	Y	Y
	CSA N292.3-14 (2014): *Management of Low- and Intermediate –level Radioactive Waste*	Y	Y
	CSA N294-19 (2019): *Decommissioning of Facilities Containing Nuclear Substances*	Y	Y

SCA	Document Title	Sufficient?	Adequate?
	CNSC G-219, *Decommissioning Planning for Licensed Activities*	Y	Y
	CNSC REGDOC-2.11 (2021): *Framework for Radioactive Waste Management and Decommissioning in Canada*	Y	Y
	REGDOC 2.11.1 (2021): *Waste Management Volume 1: Management of Radioactive Waste*	Y	Y
	CNSC REGDOC-2.11.2 (2021): *Decommissioning*	Y	Y
Security	CNSC REGDOC-2.12.3 (2020): *Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2.1*	Y	Y
Safeguards	CNSC REGDOC-2.13.1 (2018): *Safeguards and Nuclear Material Accountancy*	Y	Y
Packaging and Transport	CNSC REGDOC-2.14.1 (2015): *Volume 1, Information Incorporated by Reference in Canada's Packaging and Transport of Nuclear Substances Regulations, 2015, Version 2.*	Y	Y
Public Information Program	CNSC REGDOC-3.2.1 (2018): *Public Information and Disclosure*	Y	Y
Financial Guarantee	CNSC REGDOC-3.3.1 (2021): *Financial Guarantees for the Decommissioning of Nuclear Facilities and Termination of Licensed Activities*	Y	Y

C. SAFETY AND CONTROL AREA FRAMEWORK

C.1 Safety and Control Areas Defined

The safety and control areas identified in section 2.2, and discussed in summary in sections 3.1 through 3.14 are comprised of specific areas of regulatory interest which vary between facility types.

The following table provides a high-level definition of each SCA. The specific areas within each SCA are to be identified by the CMD preparation team in the respective areas within section 3 of this CMD.

SAFETY AND CONTROL AREA FRAMEWORK		
Functional Area	**Safety and Control Area**	**Definition**
Management	Management System	Covers the framework which establishes the processes and programs required to ensure an organization achieves its safety objectives, continuously monitors its performance against these objectives and fostering a healthy safety culture.
	Human Performance Management	Covers activities that enable effective human performance through the development and implementation of processes that ensure a sufficient number of licensee personnel are in relevant job areas and have the necessary knowledge, skills, procedures and tools in place to safely carry out their duties.
	Operating Performance	Includes an overall review of the conduct of the licensed activities and the activities that enable effective performance.
Facility and Equipment	Safety Analysis	Covers maintenance of the safety analysis that supports that overall safety case for the facility. 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.
	Physical Design	Relates to activities that impact on the ability of systems, components and structures to meet and maintain their design basis given new information arising over time and taking changes in the external environment into account.
	Fitness for Service	Covers activities that impact on the physical condition of structures, systems and components to ensure that they remain effective over time. This includes programs that ensure all equipment is available to perform its intended design function when called upon to do so.

SAFETY AND CONTROL AREA FRAMEWORK		
Functional Area	**Safety and Control Area**	**Definition**
Core Control Processes	Radiation Protection	Covers the implementation of a radiation protection program in accordance with the *Radiation Protection Regulations*. The program must ensure that contamination and radiation doses received are monitored and controlled and maintained ALARA.
	Conventional Health and Safety	The implementation of a program to manage workplace safety hazards and to protect workers.
	Environmental Protection	Covers programs that identify, control and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities.
	Emergency Management and Fire Protection	Covers emergency plans and emergency preparedness programs which exist for emergencies and for non-routine conditions. This also includes any results of exercise participation.
	Waste Management	Covers internal waste-related programs which form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility. Also covers the planning for decommissioning.
	Security	Covers the programs required to implement and support the security requirements stipulated in the regulations, the licence, orders, or expectations for the facility or activity.
	Safeguards and Non-Proliferation	Covers the programs and activities required for the successful implementation of the obligations arising from the Canada/IAEA safeguards agreements as well as all other measures arising from the *Treaty on the Non-Proliferation of Nuclear Weapons*.
	Packaging and Transport	Covers programs for the safe packaging and transport of nuclear substances to and from the licensed facility.

C.2 Specific Areas for this Facility Type

The following table identifies the specific areas that comprise each SCA for a waste management facility, as applicable for this licence application:

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	**Safety and Control Area**	**Specific Areas**
Management	Management System	▪ Management System ▪ Performance Assessment, Improvement and Management Review ▪ Change Management ▪ Records Management ▪ Problem Identification and Operating Experience ▪ Safety Culture ▪ Business Continuity
	Human Performance Management	▪ Human Performance Programs ▪ Personnel Training ▪ Fitness for Duty
	Operating Performance	▪ Conduct of Licensed Activity ▪ Procedures ▪ Reporting and Trending
Facility and Equipment	Safety Analysis	▪ Deterministic Safety Analysis ▪ Hazard Analysis
	Physical Design	▪ Design governance ▪ Facility design ▪ Structure design ▪ System design ▪ Component design
	Fitness for Service	▪ Equipment Fitness for Service ▪ Maintenance ▪ Structural Integrity ▪ Aging Management ▪ Chemistry Control ▪ Periodic inspection and testing Structural integrity
Core Control Processes	Radiation Protection	▪ Application of ALARA ▪ Worker Dose Control ▪ Radiation Protection Program Performance ▪ Radiological Hazard Control

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	**Safety and Control Area**	**Specific Areas**
	Conventional Health and Safety	▪ Performance ▪ Practices ▪ Awareness
	Environmental Protection	▪ Effluent and Emissions Control (releases) ▪ Protection of People ▪ Environmental Management System (EMS) ▪ Assessment and Monitoring ▪ Environmental Risk Assessment
	Emergency Management and Fire Protection	▪ Nuclear emergency preparedness and response ▪ Fire emergency preparedness and response ▪ Conventional emergency preparedness and response ▪ Fire Protection Program
	Waste Management	▪ Waste Characterization ▪ Waste Minimization ▪ Waste Management Practices ▪ Decommissioning Plans
	Security	▪ Facilities and Equipment ▪ Response Arrangements ▪ Security Practices ▪ Drills and Exercises
	Safeguards and Non-Proliferation	▪ Nuclear Material Accountancy and Control ▪ Access and Assistance to the IAEA ▪ Operational and Design Information ▪ Safeguards Equipment, Containment and Surveillance
	Packaging and Transport	▪ Package Design and Maintenance ▪ Packaging and Transport ▪ Registration for Use

D. INSPECTIONS

The following table includes Type II inspections conducted at DWMF during the licence period.

Inspection Dates	SCAs Covered
June 26 - 27, 2013	General - Operating Performance, Radiation Protection, Environmental Protection, Conventional Health and Safety, Emergency Management and Fire Protection
January 16 - 17, 2014	General - Human Performance Management, Operating Performance, Radiation Protection, Conventional Health and Safety, Emergency Management and Fire Protection and Security
June 9, 2014	General - Human Performance Management, Operating Performance, Radiation Protection, Conventional Health and Safety, Emergency Management and Fire Protection, Waste Management, and Security
September 15, 2014	Focused Fitness for Service
March 9, 2015	General - Management System, Operating Performance, Radiation Protection, Conventional Health and Safety, and Emergency Management and Fire Protection
March 9 - 10, 2015	Focused Human Performance Management – Training Operating Performance
November 17, 2015	General - Human Performance Management, Operating Performance, Radiation Protection, Conventional Health and Safety, and Emergency Management and Fire Protection
March 15 - 16, 2016	General - Human Performance Management, Operating Performance, Radiation Protection, Conventional Health and Safety, Emergency Management and Fire Protection, and Fitness for Service
May 9 - 10, 2016	Focused Security
May 16 – 20, 2016	Focused Human Performance Management - Training
October 13, 2016	General - Operating Performance, Human Performance Management, Radiation Protection, Conventional Health and Safety, Emergency Management and Fire Protection, Security

Inspection Dates	SCAs Covered
May 4 – 5, 2017	Focused Management System Operating Performance, Human Performance Management, Radiation Protection, Conventional Health and Safety, Emergency Management and Fire Protection, Security, and Fitness for Service
November 21 - 22, 2017	General - Human Performance Management and Radiation Protection
March 5 - 7, 2018	Focused Emergency Management and Fire Protection Management System
March 5 - 7, 2018	Focused Environmental Protection[4]
August 27 - 29, 2018	General - Human Performance Management, Operating Performance, Radiation Protection, Conventional Health and Safety, Emergency Management and Fire Protection, Environmental Protection and Security
August 27 - 29, 2018	Focused Packaging and Transport[5]
September 24, 2019	Focused Emergency Management – Fire Brigade Drill
March 11 - 12, 2020	General - Physical Design, Radiation Protection, Conventional Health and Safety, and Emergency Management and Fire Protection
March 11 - 12, 2020	Focused Fitness for Service[6]
October 20 - 21, 2020	Focused Security
February 14 - 17, 2022	Focused Radiation Protection
February 14 - 17, 2022	General - Management System and Operating Performance[7]

[4] This inspection was combined with the Focused Emergency Management and Fire Protection Inspection on March 5 – 7, 2018.
[5] This inspection was combined with the General Inspection on August 27 – 29, 2018.
[6] This inspection was combined with the General Inspection on March 11 – 12, 2020.
[7] This inspection was combined with the Focused Radiation Protection Inspection on February 14 – 17, 2022.

PART TWO

Part Two provides all relevant information pertaining directly to the licence, including:

1. the current licence;
2. any proposed changes to the conditions, licensing period, or formatting of an existing licence;
3. the proposed licence; and
4. the draft licence conditions handbook.

CURRENT LICENCE

PDF: e-Doc 4951340

Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

PDF Ref.: e-Doc 4951340
Word Ref.: e-Doc 4648110
File / Dossier : 37-2-5-0 / 2.05

WASTE FACILITY OPERATING LICENCE

DARLINGTON WASTE MANAGEMENT FACILITY

I) LICENCE NUMBER: **WFOL-W4-355.01/2023**

II) LICENSEE: Pursuant to section 24 of the *Nuclear Safety and Control Act* this licence is issued to:

Ontario Power Generation Inc.
700 University Avenue
Toronto, Ontario
M5G 1X6

III) LICENCE PERIOD: This licence is valid from **March 30, 2016** to **April 30, 2023**, unless suspended, amended, revoked, replaced, or transferred.

IV) LICENSED ACTIVITIES:

This licence authorizes the licensee to:

(i) operate the Darlington Waste Management Facility ("the facility") located at the Darlington Nuclear Generating Station, Township of Darlington, Municipality of Clarington, Regional Municipality of Durham, Province of Ontario;

(ii) possess, transfer, use, process, package, manage, and store nuclear substances that are required for, associated with or arise from the activities described in (i);

(iii) transport Category II nuclear materials that are associated with the activities described in (i) on the site of the Darlington Nuclear Generating Station;

(iv) carry out the site preparation, construction, or construction modifications at the facility associated with the authorized additional storage buildings, when on completion will result in a total of no more than 4 used fuel dry storage buildings and no more than 1 intermediate level radioactive waste storage building; and,

(v) possess and use prescribed equipment and prescribed information that are required for, associated with or arise from the activities described in (i), (ii), (iii), and (iv).

V) EXPLANATORY NOTES:

(i) Unless otherwise provided for in this licence, words and expressions used in this licence have the same meaning as in the *Nuclear Safety and Control Act* and associated regulations.

(ii) The Darlington Waste Management Facility licence conditions handbook (LCH) provides compliance verification criteria used to meet the conditions of this licence. The LCH also provides information on delegation of authority and document version control.

VI) CONDITIONS:

G GENERAL

G.1 Licensing Basis for Licensed Activities

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

(i) the regulatory requirements set out in the applicable laws and regulations;

(ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence;

(iii) the safety and control measures described in the licence application and the documents needed to support that licence application;

Unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

G.2 Notification of Changes

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

G.3 Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

G.4 Public Information and Disclosure

The licensee shall implement and maintain a public information and disclosure program.

1 MANAGEMENT SYSTEM

1.1 Management System

The licensee shall implement and maintain a management system.

1.2 Management of Contractors

The licensee shall ensure that every contractor working at the facility complies with this licence.

2 HUMAN PERFORMANCE MANAGEMENT

2.1 Human Performance Program

The licensee shall implement and maintain a human performance program.

2.2 Training Program

The licensee shall implement and maintain a training program.

3 OPERATING PERFORMANCE

3.1 Operations Program

The licensee shall implement and maintain an operating program, which includes a set of operating limits.

3.2 Reporting Requirements

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

4 SAFETY ANALYSIS

4.1 Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

5 PHYSICAL DESIGN

5.1 Design Program

The licensee shall implement and maintain a design program.

5.2 Pressure Boundary

The licensee shall implement and maintain a pressure boundary program and have in place a formal agreement with an Authorized Inspection Agency.

6 FITNESS FOR SERVICE

6.1 Fitness for Service Program

The licensee shall implement and maintain a fitness for service program.

7 RADIATION PROTECTION

7.1 Radiation Protection

The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

8 CONVENTIONAL HEALTH AND SAFETY

8.1 Conventional Health and Safety Program

The licensee shall implement and maintain a conventional health and safety program.

9 ENVIRONMENTAL PROTECTION

9.1 Environmental Protection

The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

10 EMERGENCY MANAGEMENT AND FIRE PROTECTION

10.1 Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

10.2 Fire Protection Program

The licensee shall implement and maintain a fire protection program.

11 WASTE MANAGEMENT

11.1 Waste Management Program

The licensee shall implement and maintain a waste management program.

11.2 Decommissioning Plan

The licensee shall maintain a preliminary decommissioning plan.

12 SECURITY

12.1 Security Program

The licensee shall implement and maintain a security program.

12.2 Construction

The licensee shall not carry out the activities referred to in paragraph (ii) of Part IV of this licence that relates to completed construction activities in paragraph (iv) of Part IV of this licence until the submission of the proposed security arrangements and measures for the new building, or any potential modifications to the protected area that may be associated with this new building, that is acceptable to the Commission or a person authorized by the Commission.

13 SAFEGUARDS AND NON-PROLIFERATION

13.1 Safeguards Program

The licensee shall implement and maintain a safeguards program.

14 PACKAGING AND TRANSPORT

14.1 Packaging and Transport Program

The licensee shall implement and maintain a packaging and transport program.

15 FACILITY-SPECIFIC

15.1 Construction Plans

The licensee shall submit an environmental management plan, a construction verification plan and the project design requirements prior to the commencement of construction activities described in paragraph (iv) of Part IV of this licence.

15.2 Commissioning Report

The licensee shall not carry out the activities referred to in paragraph (ii) of Part IV of this licence that relate to completed construction activities in paragraph (iv) of Part IV of this licence until the submission of a commissioning report that is acceptable to the Commission or a person authorized by the Commission.

SIGNED at OTTAWA, this 30 day of March, 2016

M. Binder

Michael Binder, President
On behalf of the Canadian Nuclear Safety Commission

PROPOSED LICENCE CHANGES

Overview

There are changes to the licence conditions. Beside the name change, no changes to the activities and the format are requested. The proposed licence contains standard and facility-specific licence conditions, and the recommended licence term is for a 10-year period. The proposed licence does not contain any new licence conditions.

Licensed Activities

1-In section IV "licensed activity", the name of the facility "Darlington Waste Management Facility" has been changed to "Nuclear Sustainability Services-Darlington" in sub-section (i) and now reads as follows:

"operate the **Nuclear Sustainability Services-Darlington (herein referred to as "the facility"), a waste management facility** located at the Darlington Nuclear Generating Station, Township of Darlington, Municipality of Clarington, Regional Municipality of Durham, Province of Ontario"

2- In section IV "licensed activity", the previous sub-section (iv) mentioned the authorization to build no more than 4 used fuel dry storage building. Because OPG requested to change the name of the buildings used to store the DSCs from used fuel dry storage building to used fuel dry storage structures, CNSC staff recommend to change the wording from "no more than 4 used fuel dry storage building" to "no more than 2 used fuel dry storage buildings and 2 used fuel dry storage structures" to reflect the name change.

Previous sub-section (iv):

carry out the site preparation, construction, or construction modifications at the facility associated with the authorized additional storage buildings, when on completion will result in a total of no more than 4 used fuel dry storage buildings and no more than 1 intermediate level radioactive waste storage building

Proposed sub-section (iv):

carry out the site preparation, construction, or construction modifications at the facility associated with the authorized additional storage buildings, when on completion will result in a total of no more than 2 used fuel dry storage buildings and 2 used fuel dry storage structures, and no more than 1 intermediate level radioactive waste storage building

Licence Conditions

3-Licence condition 12.2 “Construction”, CNSC staff recommend to change “building” to “structure” to align with the name change. The updated licence condition reads as follows:

“The licensee shall not carry out the activities referred to in paragraph (ii) of Part IV of this licence that relates to completed construction activities in paragraph (iv) of Part IV of this licence until the submission of the proposed security arrangements and measures for the new **structure**, or any potential modifications to the protected area that may be associated with this new **structure**, that is acceptable to the Commission or a person authorized by the Commission.”

And the previous licence condition as follow:

“The licensee shall not carry out the activities referred to in paragraph (ii) of Part IV of this licence that relates to completed construction activities in paragraph (iv) of Part IV of this licence until the submission of the proposed security arrangements and measures for the new **building**, or any potential modifications to the protected area that may be associated with this new **building**, that is acceptable to the Commission or a person authorized by the Commission.”

4- Licence condition 15.1 “Construction Plans”, CNSC staff recommend adding the preliminary safety analysis report to the requested documentation to submit before constructing new structures. This will ensure that the licensee respects the licensing basis accepted by the Commission at the previous hearing. Additionally, CNSC staff recommend that licence condition 15.1 requires written approval of a person authorized by the commission. The updated licence condition reads as follows:

“The licensee shall not carry out the activities referred to in paragraph (iv) of Part IV of this licence until the submission of an environmental management plan, a construction verification plan, the project design requirements and a preliminary safety analysis report Without prior written approval of a person authorized by the commission.”

And the previous licence condition as follow:

“The licensee shall submit an environmental management plan, a construction verification plan and the project design requirements prior to the commencement of construction activities described in paragraph (iv) of Part IV of this licence.”

Licence Format

No Change

Licence Period

CNSC staff are recommending a 10-year licence period. This is also the period OPG requested.

PROPOSED LICENCE

e-Doc: 6822670

PDF Ref.: e-Doc 6896075
Word Ref.: e-Doc 6822670
File / Dossier : 37-2-5-0 / 2.05

WASTE FACILITY OPERATING LICENCE

NUCLEAR SUSTAINABILITY SERVICES-DARLINGTON

I) LICENCE NUMBER: **WFOL-W4-355.00/2033**

II) LICENSEE: Pursuant to section 24 of the *Nuclear Safety and Control Act* this licence is issued to:

Ontario Power Generation Inc.
700 University Avenue
Toronto, Ontario
M5G 1X6

III) LICENCE PERIOD: This licence is valid from **March 30, 2023** to **April 30, 2033**, unless suspended, amended, revoked, replaced, or transferred.

IV) LICENSED ACTIVITIES:

This licence authorizes the licensee to:

(i) operate the Nuclear Sustainability Services-Darlington (herein referred to as "the facility"), a waste management facility located at the Darlington Nuclear Generating Station, Township of Darlington, Municipality of Clarington, Regional Municipality of Durham, Province of Ontario;

(ii) possess, transfer, use, process, package, manage, and store nuclear substances that are required for, associated with or arise from the activities described in (i);

(iii) transport Category II nuclear materials that are associated with the activities described in (i) on the site of the Darlington Nuclear Generating Station;

(iv) carry out the site preparation, construction, or construction modifications at the facility associated with the authorized additional storage structures, when on completion will result in a total of no more than 2 used fuel dry storage buildings and 2 used fuel dry storage structures, and no more than 1 intermediate level radioactive waste storage building; and,

(v) possess and use prescribed equipment and prescribed information that are required for, associated with or arise from the activities described in (i), (ii), (iii), and (iv).

V) EXPLANATORY NOTES:

(i) Unless otherwise provided for in this licence, words and expressions used in this licence have the same meaning as in the *Nuclear Safety and Control Act* and associated Regulations.

(ii) The Darlington Waste Management Facility licence conditions handbook (LCH) provides compliance verification criteria used to meet the conditions of this licence. The LCH also provides information on delegation of authority and document version control.

VI) CONDITIONS:

G GENERAL

G.1 Licensing Basis for Licensed Activities

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

(i) the regulatory requirements set out in the applicable laws and regulations;

(ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence;

(iii) the safety and control measures described in the licence application and the documents needed to support that licence application;

Unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

G.2 Notification of Changes

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

G.3 Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

G.4 Public Information and Disclosure

The licensee shall implement and maintain a public information and disclosure program.

1 MANAGEMENT SYSTEM

1.1 Management System

The licensee shall implement and maintain a management system.

1.2 Management of Contractors

The licensee shall ensure that every contractor working at the facility complies with this licence.

2 HUMAN PERFORMANCE MANAGEMENT

2.1 Human Performance Program

The licensee shall implement and maintain a human performance program.

2.2 Training Program

The licensee shall implement and maintain a training program.

3 OPERATING PERFORMANCE

3.1 Operations Program

The licensee shall implement and maintain an operating program, which includes a set of operating limits.

3.2 Reporting Requirements

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

4 SAFETY ANALYSIS

4.1 Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

5 PHYSICAL DESIGN

5.1 Design Program

The licensee shall implement and maintain a design program.

5.2 Pressure Boundary

The licensee shall implement and maintain a pressure boundary program and have in place a formal agreement with an Authorized Inspection Agency.

6 FITNESS FOR SERVICE

6.1 Fitness for Service Program

The licensee shall implement and maintain a fitness for service program.

7 RADIATION PROTECTION

7.1 Radiation Protection

The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

8 CONVENTIONAL HEALTH AND SAFETY

8.1 Conventional Health and Safety Program

The licensee shall implement and maintain a conventional health and safety program.

9 ENVIRONMENTAL PROTECTION

9.1 Environmental Protection

The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

10 EMERGENCY MANAGEMENT AND FIRE PROTECTION

10.1 Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

10.2 Fire Protection Program

The licensee shall implement and maintain a fire protection program.

11 WASTE MANAGEMENT

11.1 Waste Management Program

The licensee shall implement and maintain a waste management program.

11.2 Decommissioning Plan

The licensee shall maintain a preliminary decommissioning plan.

12 SECURITY

12.1 Security Program

The licensee shall implement and maintain a security program.

12.2 Construction

The licensee shall not carry out the activities referred to in paragraph (ii) of Part IV of this licence that relates to completed construction activities in paragraph (iv) of Part IV of this licence until the submission of the proposed security arrangements and measures for the new structure, or any potential modifications to the protected area that may be associated with this new structure, that is acceptable to the Commission or a person authorized by the Commission.

13 SAFEGUARDS AND NON-PROLIFERATION

13.1 Safeguards Program

The licensee shall implement and maintain a safeguards program.

14 PACKAGING AND TRANSPORT

14.1 Packaging and Transport Program

The licensee shall implement and maintain a packaging and transport program.

15 FACILITY-SPECIFIC

15.1 Construction Plans

The licensee shall not carry out the activities referred to in paragraph (iv) of Part IV of this licence until the submission of an environmental management plan, a construction verification plan, the project design requirements and a preliminary safety analysis report without prior written approval of a person authorized by the Commission.

15.2 Commissioning Report

The licensee shall not carry out the activities referred to in paragraph (ii) of Part IV of this licence that relate to completed construction activities in paragraph (iv) of Part IV of this licence until the submission of a commissioning report that is acceptable to the Commission or a person authorized by the Commission.

SIGNED at OTTAWA, this ___ day of_____, 2023

_____

Rumina Velshi, President
On behalf of the Canadian Nuclear Safety Commission

DRAFT LICENCE CONDITIONS HANDBOOK

e-Doc: 6818099

Canada's Nuclear Regulator

e-Doc 6818099 (Word)
e-Doc 6896065 (PDF)

Licence Conditions Handbook

ONTARIO POWER GENERATION INC.
Nuclear Sustainability Services-Darlington
Waste Facility Operating Licence (WFOL)
WFOL-W4-355.00/2033

Revision 0

Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Canada

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Licence Conditions Handbook
LCH- W4-355.00/2033
Nuclear Sustainability Services - Darlington
Waste Facility Operating Licence
WFOL-W4-355.00/2033

SIGNED at OTTAWA this _____day of _____, 2023

_____

Nancy Greencorn, Director
Wastes and Decommissioning Division
CANADIAN NUCLEAR SAFETY COMMISSION

Revision History:

Effective Date	Revision	LCH E-DOCS #	Section(s) Changed	Description of Changes	DCR E-DOCS #
DRAFT	R000	6818099	N/A	Original document for hearing	N/A

TABLE OF CONTENTS

INTRODUCTION

The general purpose of the Licence Conditions Handbook (LCH) is to identify and clarify the relevant parts of the licensing basis for each Licence Condition (LC). This will help ensure that the licensee maintains facility operation in accordance with the licensing basis for the facility and the intent of the licence. The LCH should be read in conjunction with the licence.

The LCH typically has three parts under each LC: the Preamble, Compliance Verification Criteria (CVC), and Guidance. The Preamble explains, as needed, the regulatory context, background, and/or history related to the LC. CVC are criteria used by Canadian Nuclear Safety Commission (CNSC) staff to verify and oversee compliance with the LC. Guidance is non-mandatory information, including direction, on how to comply with the LC.

Current versions of licensee documents listed in this LCH are recorded in e-Doc 4906355, which is controlled by the Wastes and Decommissioning Division (WDD) of the CNSC and is available to the licensee upon request.

This LCH has the following appendices:

- APPENDIX A, which describes the change control process;
- APPENDIX B, which includes a list of definitions and acronyms used in this LCH;
- APPENDIX C, which includes a list of licensing basis publications referenced in this LCH;
- APPENDIX D, which includes a list of licensee documents that require notification of change; and,
- APPENDIX E, which includes a list of guidance publications referenced in this LCH.

GENERAL

Licence Condition G.1 Licensing Basis for Licensed Activities

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

(i) the regulatory requirements set out in the applicable laws and regulations;

(ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence;

(iii) the safety and control measures described in the licence application and the documents needed to support that licence application;

Unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

Preamble

The licensing basis is discussed in REGDOC-3.5.3, *Regulatory Fundamentals.*

The standardized LCs, organized by Safety and Control Area (SCA), apply to all the licensed activities. Specific LCs were added for nuclear facility-specific activities, if required.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
00044-CORR-00531-01153	Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence	N

The safety and control measures mentioned in the LC under Parts (ii) and (iii) of the licensing basis include important aspects of analysis, design, operation, etc. They may be found in high-level programmatic licensee documents but might also be found in lower-level, supporting documentation. They also include safety and control measures in licensing basis publications (e.g., CNSC REGDOC or Canadian Standards Association (CSA) Group standards) that are cited in the licence, the application, or in the licensee's supporting documentation.

Licensing basis publications are listed in tables in this LCH under the most relevant LC. All "shall" or normative statements in licensing basis publications are considered CVC unless stated otherwise. If any "should" or informative statements in licensing basis publications are also considered CVC, this is also explained under the most relevant LC.

The licensee documents in question, as well as the relevant licensing basis publications, may cite other documents that also contain safety and control measures (i.e., there may be safety and control measures in "nested" references). There is no predetermined limit to the degree of nesting at which relevant safety and control measures may be found.

LC G.1 requires the licensee to conform to, and/or implement, all the safety and control measures. Note, however, that not all details in referenced documents are necessarily considered to be safety and control measures.

- Details that are not directly relevant to safety and control measures for facilities or activities authorized by the licence are excluded from the licensing basis.

- Details that are relevant to a different SCA (i.e., not the one associated with the main document), are only part of the licensing basis to the extent that they are consistent with the main requirements for both SCAs.

The licensing basis is established by the Commission at the time the licence is issued. Per LC G.1, operation during the licence period that is not in accordance with the licensing basis is only allowed based on the written approval of the Commission. Similarly, only the Commission can change the licensing basis during the licence period; and this would also be expected to be recorded in writing.

In the event of any perceived or real conflict or inconsistency between two elements of the licensing basis, the licensee shall consult CNSC staff to determine the approach to resolve the issue.

This LC is not intended to unduly inhibit the ongoing management and operation of the facility or the licensee's ability to adapt to changing circumstances and continuously improve, in accordance with its management system. Where the licensing basis refers to specific configurations, methods, solutions, designs, etc., the licensee is free to propose alternate approaches as long as they remain, overall, in accordance with the licensing basis and have a neutral or positive impact on health, safety, the environment, security, and safeguards. However, the licensee shall assess changes to confirm that operations remain in accordance with the licensing basis.

Changes to certain licensee documents require written notification to the CNSC, even if they are in accordance with the licensing basis. Further information on this topic is provided under LC G.2.

For unapproved operation that is not in accordance with the licensing basis, the licensee shall take action as soon as practicable to return to a state consistent with the licensing basis, taking into account the risk significance of the situation.

In the event that the Commission grants approval to operate in a manner that is not in accordance with the existing licensing basis, this would effectively revise the licensing basis for the facility. The appropriate changes would be reflected in the CVC of the relevant LC.

Description of NSS-D Licensed Activities

The waste operating licence, WFOL-W4-355.00/2033 authorizes OPG to:

(i) operate the Nuclear Sustainability Services-Darlington (herein referred to as "the facility"), a waste management facility located at the Darlington Nuclear Generating Station, Township of Darlington, Municipality of Clarington, Regional Municipality of Durham, Province of Ontario;

(ii) possess, transfer, use, process, package, manage, and store nuclear substances that are required for, associated with or arise from the activities described in (i);

(iii) transport Category II nuclear materials that are associated with the activities described in (i) on the site of the Darlington Nuclear Generating Station;

(iv) carry out the site preparation, construction, or construction modifications at the facility associated with the authorized additional storage structures, when on completion will result in a total of no more than 2 used fuel dry storage buildings and 2 used fuel dry storage structures, and no more than 1 intermediate level radioactive waste storage building; and,

(v) possess and use prescribed equipment and prescribed information that are required for, associated with or arise from the activities described in (i), (ii), (iii), and (iv).

Guidance

When the licensee becomes aware that a proposed change or activity might be outside the licensing basis, it should first seek direction from CNSC staff regarding the potential acceptability of this change or activity. The licensee should take into account that certain types of proposed changes might require significant lead times before CNSC staff can make recommendations and/or the Commission can properly consider them. Guidance for notifications to CNSC related to licensee changes are discussed under LC G.2.

Licence Condition G.2 Notification of Changes

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

Preamble

CNSC staff tracks, in e-Doc 4906355, the version history of licensee documents that require notification of change (with the exception of security-related documents).

Licensee documents tabulated in the CVC of the LCH are subdivided into groups having different requirements for notification of change – ones that require prior written notification of changes and those that require written notification only. For the former type, the licensee shall submit the document to the CNSC prior to implementing the change. Typically, the requirement is to submit the proposed changes 30 days prior to planned implementation; however, the licensee shall allow sufficient time for the CNSC to review the change proportionate to its complexity and the importance of the safety and control measures being affected. For the latter type, the licensee need only submit the document at the time of implementing the change.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
OPG-PROG-0001	Information Management	N
OPG-PROC-0019	Records and Document Management	N

Written notification is a physical or electronic communication from a person authorized to act on behalf of the licensee to a CNSC delegated authority or a CNSC staff member acting on behalf of a CNSC delegated authority.

In general, the changes for which the licensee shall notify the CNSC are captured as changes to specific licensee documents. The LCH identifies them under the most relevant LC. However, the licensee documents identified in the LCH only represent the minimum subset of documents that require notification of change. For any change that is not captured as a change to a document identified in the LCH, if it negatively impacts designs, operating conditions, policies, programs, methods, or other elements that are integral to the licensing basis, the licensee shall provide written notification of the change. For example, if a licensee document in the CVC refers to another document, including a third-party document, without citing the revision number of that document, if that document changes and the licensee uses the revised version, the licensee shall determine if it is necessary to notify the CNSC of the change.

The documents needed to support the licence application may include documents produced by third parties (e.g., reports prepared by third party contractors). Changes to these documents require written notification to the CNSC only if the new version continues to form part of the licensing basis. That is, if the licensee implements a new version of a document prepared by a third party, it shall inform the CNSC of the change(s), per LC G.2. On the other hand, if a third party has updated a certain document, but the licensee has not adopted the new version as part of its safety and control measures, the licensee is not required to inform the CNSC that the third party has changed the document.

Licensee documents tabulated in the CVC of the LCH are subdivided into groups having different requirements for notification of change – ones that require prior written notification of changes and those that require written notification only. For the former type, the licensee shall submit the document to the CNSC prior to implementing the change. Typically, the requirement is to submit the proposed changes 30 days prior to planned implementation; however, the licensee shall allow sufficient time for the CNSC to review the change proportionate to its complexity and the importance of the safety and control measures being affected. For the latter type, the licensee need only submit the document at the time of implementing the change.

Changes to the licensing basis that are not clearly in the safe direction require further assessment of impact to determine if prior Commission approval is required in accordance with LC G.1. Additional considerations for changes to facility operation or operating limits, conditions or procedures are discussed under LC 3.1 and those for facility design or equipment are discussed under LC 5.1.

If the licensee document, or some part of it, also requires CNSC acceptance of change, a footnote has been added to the table. Such a requirement may be established in the document itself, in another LC, or in a licensing basis publication.

Written notifications shall include a summary description of the change, the rationale for the change, expected duration (if not a permanent change), and a summary explanation of how the licensee has concluded that the change remains in accordance with the licensing basis (e.g., an evaluation of the impact on health, safety, security, the environment and Canada's international obligations). A copy of the revised written notification document shall accompany the notification. All written notifications shall be transmitted to CNSC per established communications protocols.

The above also applies to a notice of change that requires CNSC staff acceptance, due to some other requirement in the licensing basis.

Changes that are not clearly in the safe direction require further assessment of impact to determine if Commission approval is required in accordance with LC G.1.

The licensee shall notify the CNSC in writing when it plans to implement a new licensing basis publication, including the date by which implementation of the publication will be complete. The notice shall indicate the corresponding changes to licensee documents listed in the CVC of the LCH.

Guidance

A list of criteria that could help determine if a change would be in accordance with the licensing basis is provided in Appendix A of e-Doc 4055483, *Assessing licensee changes to documents or operations*. Such criteria would also be used if the change requires CNSC staff acceptance, due to some other requirement in the licensing basis.

For proposed changes that would not be in accordance with the licensing basis, the Guidance for LC G.1 applies.

Licence Condition G.3 Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

Preamble

The licensee is responsible for all costs of implementing the proposed decommissioning plan (see LC 11.2) and providing an appropriate financial guarantee (FG) that is acceptable to the Commission.

Ontario Power Generation Inc. (OPG) maintains a consolidated financial guarantee to cover the future decommissioning of all its Ontario based Class I and waste nuclear substance licence facilities, and the long-term management of used fuel and all other radioactive waste. The current financial guarantee for OPG was accepted by the Commission on [DATE].

The financial guarantee and the associated decommissioning plans are required to be revised by OPG every five years or when requested by the Commission. The acceptance of the proposed financial guarantee is a subject of a separate Commission proceeding not related to the licence renewal process. The OPG consolidated financial guarantee includes:

1. Access to the Ontario Nuclear Funds Agreement (ONFA) segregated funds pursuant to the CNSC Financial Security and ONFA Access Agreement between OPG, the Province of Ontario, and the CNSC, effective [DATE]; and,

2. A trust fund for the management of used fuel established pursuant to the *Nuclear Fuel Waste Act*.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Org	Doc #	Title	Prior Notice
Joint	N/A	CNSC Financial Security and ONFA Access Agreement between OPG, the Province of Ontario and the CNSC effective [DATE]	Y[1]

Note: [1]Requires CNSC acceptance of change.

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CNSC	REGDOC-3.3.1	Financial Guarantees for the Decommissioning of Nuclear Facilities and Termination of Licensed Activities	2021	TBD*

*OPG has committed to submitting a gap analysis and implementation plan for REGDOC-3.3.1, *Financial Guarantees for the Decommissioning of Nuclear Facilities and Termination of Licensed Activities* by March 17, 2023.

The financial guarantee for decommissioning the nuclear facility shall be reviewed and revised by the licensee every five years or when the Commission requires or following a revision of the preliminary decommissioning plan (PDP) that significantly impacts the financial guarantee.

The next full update to the 5 year reference plan for financial guarantee purposes is expected in 2027.

The licensee shall submit annually to the Commission a written report confirming that the financial guarantees for decommissioning costs remain valid and in effect and sufficient to meet the decommissioning needs. The licensee shall submit this report by the end of February of each year, or at any time as the Commission may request.

Guidance

None.

Licence Condition G.4 Public Information and Disclosure

The licensee shall implement and maintain a public information and disclosure program.

Preamble

A public information and disclosure program (PIDP) is a regulatory requirement for licence applicants and licensees under the *Class I Nuclear Facilities Regulations*, which requires that a licence application contain a program to inform persons living in the vicinity of the site of the general nature and characteristics of the anticipated effects of the licensed activity on the environment and the health and safety of person.

The primary goal of the PIDP, as it relates to the licensed activities, is to ensure that information related to the health, safety and security of persons and the environment, and other issues associated with the life cycle of nuclear facilities are effectively communicated to the public.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-STD-AS-0013	Nuclear Public Information Disclosure	N

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CNSC	REGDOC 3.2.1	Public Information and Disclosure	2018	Implemented

Guidance

None provided.

SCA – MANAGEMENT SYSTEM

Licence Condition 1.1 Management System

The licensee shall implement and maintain a management system.

Preamble

The management system must satisfy the requirements set out in the NSCA, regulations made pursuant to the NSCA, the licence, and the measures necessary to ensure that safety is of paramount consideration in the implementation of the management system. An adequately established and implemented management system provides CNSC staff confidence and evidence that the licensing basis remains valid.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
OPG-PROG-0009	Items and Services Management	N
N-STD-AS-0020	Nuclear Management Systems Organizations	N
N-PROC-AS-0077	Nuclear Safety Culture Assessment	N
N-STD-AS-0023	Nuclear Safety Oversight	N
N-POL-0001	Nuclear Safety Policy	N
N-CHAR-AS-0002	Nuclear Management System	Y
N-PROG-AS-0001	Nuclear Management System Administration	N
OPG-PROG-0039	Project Management	N
OPG-PROG-RA-0010	Independent Assessments	N

Licensing Basis Publications

Org	Document #	Title	Version	Effective Date
CSA	N286	Management system requirements for nuclear facilities	2012 (R2017)	Implemented

Guidance

Guidance Publications

Org	Doc #	Title
CNSC	REGDOC-2.1.1	Management System
CSA Group	N286.0.1	Commentary on N286-12, Management system requirements for nuclear facilities

Licence Condition 1.2 Management of Contractors

The licensee shall ensure that every contractor working at the facility complies with this licence.

Preamble

This LC requires that the licensee retain responsibility for the protection of the health, safety, and security of the public and workers, and the protection of environment when contractors perform licensed activities.

Compliance Verification Criteria

The management of contractors will be evaluated against the following elements and principles:

- the risks to contractors and risks to the organization from the use of contractors are evaluated to identify, assess, and eliminate or control hazards;
- contractors are adequately trained in up-to-date procedures and are qualified and competent (i.e., education, certification, designation, training, knowledge, skills, experience, abilities, and attitudes) to conduct work within the licensed facility; and,
- work carried out by the contractor is approved by competent members of the licensee's staff and monitored by qualified personnel.

As defined by the *General Nuclear Safety and Control Regulations*, workers include contractors and temporary employees who perform work that is referred in the licence. Although contractors may perform certain licensed activities in these circumstances, OPG retains the responsibility that the facility remains compliant with the licence. As such, OPG is accountable to the CNSC to provide the required assurances that the health, safety, and security of the public and workers, and the environment are protected. This accountability to the CNSC cannot be delegated through contractual arrangements.

Guidance

None provided.

SCA – HUMAN PERFORMANCE MANAGEMENT

Licence Condition 2.1 Human Performance Program

The licensee shall implement and maintain a human performance program.

Preamble

Paragraph 3(d)(1) of the *Class I Nuclear Facilities Regulations* requires that a licence application contain the proposed human performance program for the activity to be licensed, including measures to ensure workers' fitness for duty.

It is important that the licensee continuously monitors human performance, takes steps to identify human performance weaknesses and mechanisms that will improve human performance and reduce the likelihood of nuclear safety events that are attributable to human performance.

Human Factors are factors that influence human performance as it relates to the safety of a nuclear facility or activity over all design and operations phases. These factors may include the characteristics of the person, task, equipment, organization, environment, and training. The consideration of human factors in issues such as interface design, training, procedures, and organization and job design may affect the reliability of humans performing tasks under various conditions.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-PROG-AS-0002	Human Performance	N
N-PROC-OP-0047	Hours Of Work Limits And Managing Worker Fatigue	Y

Licensing Basis Publications

Org	Document #	Title	Version	Effective Date
CNSC	REGDOC-2.2.4	Fitness for Duty: Managing Worker Fatigue	2017	Implemented
CNSC	REGDOC-2.2.4	Fitness for Duty, Volume II: Managing Alcohol and Drug Use, version 3	2021	Implemented*
CNSC	REGDOC-2.1.2	Safety Culture	2018	Implemented

*Fitness for Duty, Volume II: Managing Alcohol and Drug Use, version 3 implemented, with the exception of pre-placement and random alcohol drug testing. OPG has committed to providing further details on the implementation of the remaining portions of REGDOC 2.2.4 Vol II.

Guidance

Guidance Publications

Org	Doc #	Title
CNSC	REGDOC-2.2.5	Minimum Staff Complement
CNSC	REGDOC-2.2.1	Human Factors
CNSC	REGDOC 2.5.1	General Design Considerations: Human Factors

Licensees should implement a program that continuously monitors human performance, takes steps to identify human performance weaknesses, improves human performance, and reduces the likelihood of human performance related causes and root causes of nuclear safety events.

The human performance program should address and integrate the range of human factors that influence human performance, which include, but may not be limited to the following:

- the provision of qualified staff;
- the reduction of human error;
- organizational support for safe work activities; and,
- the continuous improvement of human performance.

Licence Condition 2.2 Training Program

The licensee shall implement and maintain a training program.

Preamble

Paragraphs 12(1)(a) and 12(1)(b) of the *General Nuclear Safety and Control Regulations* require that licensees ensure that workers are trained and qualified to carry on the licensed activity safely.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-PROC-TR-0008	Systematic Approach to Training	N
N-PROG-TR-0005	Training	N

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CNSC	REGDOC-2.2.2	Personnel Training	2016	Implemented

Guidance

None provided.

SCA – OPERATING PERFORMANCE

License Condition 3.1 Operations Program

The licensee shall implement and maintain an operating program, which includes a set of operating limits.

Preamble

None provided.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
W-PROG-WM-0001	Nuclear Waste Management	Y
00044-OPP-01911.1-00001	Operating Policies and Principles, Darlington Waste Management Facility	Y

This LC requires that OPG implement and maintain adequate operating policies, programs and procedures. These include:

- define the operating rules consistent with the safety report and other licensing support documentation within which the facility will be operated, maintained and modified, all of which should ensure nuclear safety;
- specify the authorities of facility staff to make decisions within the defined boundaries; and,
- identify and differentiate between actions where discretion may be applied and where jurisdictional authorization is required.

OPG shall ensure that procedures are current, periodically reviewed and updated, and complied with at all times.

Guidance

None provided.

Licence Condition 3.2 Reporting Requirements

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

Preamble

This LC requires the licensee to implement and maintain a process for reporting information to the CNSC. This includes monitoring results, changes to facilities or approved activities, performance assessments and the occurrence of unusual events. Sections 29 and 30 of the *General Nuclear Safety and Control Regulations* provides further insight into reportable events.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-PROG-RA-0002	Conduct of Regulatory Affairs	N
N-PROG-RA-0003	Performance Improvement	N
N-PROC-RA-0020	Preliminary Event Notification	N
00044-OPP-01911.1-00001	Operating Policies and Principles, Darlington Waste Management Facility	Y

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CNSC	REGDOC-3.2.1	Public Information and Disclosure	2018	Implemented
CNSC	REGDOC 3.1.2	Reporting Requirements, Volume 1: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	2018	Implemented

CNSC staff will verify that OPG submits a written report within 90 days of the end of each calendar year quarter on the operations of the Nuclear Sustainability Services – Darlington (NSS-D), OPG's waste management facility and an annual written report to the CNSC within 90 days of the end of the calendar year that summarizes the information submitted in their quarterly reports.

The quarterly reports shall include at a minimum the following information:

- the principal licensed activities completed;
- the results of OPG's monitoring programs;
- a summary description of events reported to the Commission pursuant to sections 29 and 30 of the *General Nuclear Safety and Control Regulations*;
- a summary description of any changes in the methods, procedures and equipment used to carry out the licensed activities, and any modifications made to the facility;
- a trending analysis of operational performance.

Guidance

For the purposes of efficiency, the annual report submission may be submitted with, and as a separate section of, the fourth quarterly operations report.

SCA – SAFETY ANALYSIS

Licence Condition 4.1 Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

Preamble

None provided.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-PROG-MP-0014	Reactor Safety Program	N
00044-SR-01320-10002	Darlington Waste Management Facility Safety Report	Y

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CSA Group	N292.0	General principles for the management of radioactive waste and irradiated fuel	2019	Implemented
CSA Group	N292.2	Interim dry storage of irradiated fuel	2013	Implemented
CSA Group	N292.3	Management of low- and intermediate-level radioactive waste	2014	Implemented
CSA Group	N286.7	Quality assurance of analytical, scientific, and design computer programs	2016	Implemented

The safety analysis report is to confirm that the consequences of a range of events are acceptable. It includes an integrated assessment of the facility to demonstrate, among other things, adequate safety for external events such as fires, floods, and tornados, and adequate protective features to ensure the effects of an event do not impair safety related systems, structures, and components (SSC).

Every five years, OPG shall submit a revised safety analysis report for the facility. CNSC staff review the safety analysis report to verify that OPG employs appropriate assumptions, applies adequate scope, and demonstrates acceptable results. The safety analysis report must demonstrate that the radiological consequences of accident scenarios do not exceed public dose limits.

Licensees shall carry out safety analyses to confirm that facility design changes will not result in a reduction of safety compared to the licensing basis, as per LC G.1. The safety analysis report shall:

- demonstrate compliance with public dose limits, the dose-related criteria, structural-integrity-related criteria, the limits on process and safety parameters, and safety or safety-related system requirements;
- justify appropriateness of the technical solutions employed in the supporting justification of safety requirements; and,
- complement other analyses and evaluations in defining a complete set of design and operating requirements.

OPG is expected to provide periodic updates to the report as needed or when there are major facility changes. The current safety analysis report for the NSS-D was submitted to CNSC staff in 2021. The revised safety analysis report is due to be submitted to CNSC staff in 2026.

Guidance

Guidance Publications

Org	Doc #	Title
CNSC	REGDOC 2.4.4	Safety Analysis for Class 1B Nuclear Facilities

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SCA – PHYSICAL DESIGN

Licence Condition 5.1 Design Program

The licensee shall implement and maintain a design program.

Preamble

None provided.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-STD-MP-0028	Conduct of Engineering	N
N-STD-MP-0027	Configuration Management	N
N-PROG-MP-0009	Design Management	N
N-PROG-MP-0001	Engineering Change Control	N

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CSA Group	N393	Fire protection for facilities that process, handle, or store nuclear substances	2013 (R2018)	Implemented
CSA Group	N393	Fire protection for facilities that process, handle, or store nuclear substances	2022	TBD*
NRC	N/A	National Building Code of Canada (2010)	2010	Implemented
NRC	N/A	National Building Code of Canada (2015)	2015	December 1, 2022
NRC	N/A	National Building Code of Canada (2020)	2020	TBD*
NRC	N/A	National Fire Code of Canada (2010)	2010	Implemented
NRC	N/A	National Fire Code of Canada (2015)	2015	December 1, 2022
NRC	N/A	National Fire Code of Canada (2020)	2020	TBD*

The licensee shall ensure that facility design and changes to facility design are accurately reflected in the safety analysis. Furthermore, the licensee shall ensure that facility status changes are controlled such that the facility is maintained and modified within the limits prescribed by the design basis and the licensing basis. Where the standards in those bases require specific reports, these shall be submitted to the CNSC.

The design of the nuclear facility and any modification shall comply with applicable codes, standards and regulations including adequate consideration for human factors.

*The licensee shall design, build, modify, and otherwise carry out work related to the nuclear facility in compliance with CSA Group standard N393, *Fire Protection for Facilities That Process, Handle, or Store Nuclear Substances*, the NRC *National Building Code of Canada* (2020), and the NRC *National Fire Code of Canada* (2020) for any new designs.

The licensee shall submit the update or reaffirmation of the code compliance review as per the intervals outlined in CSA Group standard N393, *Fire Protection for Facilities That Process, Handle, or Store Nuclear Substances.*

Guidance

Guidance Publications

Org	Doc #	Title
CNSC	REGDOC 2.5.1	General Design Considerations: Human Factors
CSA Group	N290.12	Human factors in design for nuclear power plants
CSA Group	N291	Requirements for safety-related structures for nuclear power plants

With regard to modifications, the design basis for the plant should be documented and maintained to reflect design changes to ensure adequate configuration management. The design basis should be maintained to reflect new information, operating experience (OPEX), safety analyses, and the resolution of safety issues or the correction of deficiencies. The impacts of the design changes should be fully assessed, addressed and accurately reflected in the safety analyses prior to implementation.

The design program should minimize the potential for human error and promote safe and reliable system performance through the consideration of human factors in the design of facilities, systems, and equipment.

License Condition 5.2 Pressure Boundary

The licensee shall implement and maintain a pressure boundary program and have in place a formal agreement with an Authorized Inspection Agency.

Preamble

This LC ensures that an Authorized Inspection Agency (AIA) will be subcontracted directly by the licensee. An AIA is an organization recognized by the CNSC as authorized to register designs and procedures, perform inspections, and other functions and activities as defined by CSA Group standard N285.0, *General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants* and its applicable referenced publications (e.g., CSA Group standard B51, *Boiler, Pressure Vessel, and Pressure Piping Code* and the National Board Inspection Code). The AIA is accredited by the American Society of Mechanical Engineers (ASME) as stipulated by NCA-5121 of the ASME Boiler & Pressure Vessel Code.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-LIST-00531-10003	Index to OPG Pressure Boundary Program Elements	N
N-MAN-01913.11-10000	Pressure Boundary Program Manual	N
N-CORR-00531-20012	Authorized Inspection Agency Service Agreement[1]	Y
N-PROC-MP-0082	Design Registration	Y
N-PROG-MP-0004	Pressure Boundary	Y
N-PROC-MP-0040	System and Item Classification	Y

Note: [1]Termination of the agreement is considered a change that requires prior written notification to the CNSC.

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
ASME	B31.1	Power Piping	2010	Implemented
CSA Group	B51	Boiler, pressure vessel, and pressure piping code	2009 and Update No. 1	Implemented
CSA Group	N285.0	General requirements for pressure-retaining systems and components in CANDU nuclear power plants	2008 and Updates No. 1 and 2; and Annex N of N285.0-12 and Update No. 1	Implemented

Org	Doc #	Title	Version	Effective Date
NFPA	NFPA-24	Standard for the Installation of Private Fire Service Mains and Their Appurtenances	2010	Implemented
NFPA	NFPA-20	Standard for the Installation of Stationary Pumps for Fire Protection	2010 and Amendment 1 and Amendment 2	Implemented

For the purpose of the following, “registered”, “accepted” and “approved” means either by the Commission or by a person authorized by the Commission, or by an Authorized Inspection Agency designated by the Commission for that purpose.

For the NSS-D, OPG shall:

- Comply with CSA Group standard N285.0-08 (including Updates No. 1 and No. 2), *General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants*.
- Design, manufacture, fabricate, procure, install, modify, repair, test, examine, inspect, or otherwise perform work related to vessels, boilers, systems, piping, fittings, parts, components and supports in accordance with the technical requirements in CSA Group standard N285.0-08 (including Updates No. 1 and No. 2), *General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants*. Where indicated by this standard, OPG shall have the following:
  - registered designs for systems, components and supports;
  - accepted overpressure protection reports;
  - approved code classifications, including applicable standards;
  - registered welding and brazing procedures;
  - accepted mechanical joint procedures;
  - qualified welders, welding operators, brazers, and examination personnel;
  - accepted quality assurance and quality control programs;
  - accepted plans and procedures; and,
  - markings for vessels, boilers, systems, piping, fittings, parts, components and supports.
- Operate vessels, boilers, systems, piping, fittings, parts, components and supports safely and keep them in a safe condition. OPG shall:
  - follow accepted work plans and procedures to test, maintain or alter overpressure protection devices;
  - comply with operating limits specified in certificates, orders, designs, overpressure protection reports and applicable codes and standards; and,

- have any certified boiler or vessel that is in operation or use inspected and certified by an authorized inspector according to an accepted schedule.

- Keep records of regulatory approvals and other documents required under this section and the standards applicable to the work or equipment.
- Have a formal agreement with an Authorized Inspection Agency to perform activities as defined in CSA Group standard N285.0-08 (including Updates No. 1 and No. 2), *General requirements for pressure-retaining systems and components in CANDU nuclear power plants*. OPG shall provide the Commission with a copy of the agreement.
- Maintain a pressure boundary program document roadmap in compliance with Annex N of CSA Group standard N285.0-12 and Update No. 1.

Classification, Registration and Reconciliation Procedures

OPG shall prepare procedures describing the classification, registration and reconciliation processes and the associated controls to ensure compliance with CSA Group standard N285.0-08 (including Updates No. 1 and No. 2), *General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants*. These procedures must form a part of the pressure boundary program.

OPG shall provide prior written notification to the Commission or to a person authorized by the Commission, of any changes to the procedures describing the classification, registration and reconciliation process.

Overpressure Protection Report

OPG shall provide written notification to the Commission, or a person authorized by the Commission, of new or revised overpressure protection reports, after the final registration. The notification may be provided in the form of a letter.

Quality Assurance and Quality Control Programs

OPG's pressure boundary quality assurance program shall comply with CSA Group standard N285.0-08 (including Updates No. 1 and No. 2), *General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants*.

Class 6 or exempt-from-classification components that are required to be registered shall be subject to the quality requirements of CSA Group standard B51-09 and Update No. 1, *Boiler, Pressure Vessel, and Pressure Piping Code*. OPG's pressure boundary quality control programs for these components shall be reviewed and approved by the Authorized Inspection Agency.

Registration of Fire Protection Systems

Water-based fire protection systems and associated fittings and components are to be classified as Code Class 6, designed to American Society of Mechanical Engineers (ASME) B31.1 (2010), *Power piping*, and registered.

The following fire protection systems' fittings and components may be exempt from requiring Canadian Registration Numbers provided they meet the following exemption criteria:

- fittings and components that are cUL or ULC listed and suitable for the expected environmental conditions and maximum pressures; or
- pressurized cylinders and tubes, such as extinguishers, inert gas and foam tanks, which bear Transport Canada approvals and suitable for the expected environmental conditions and maximum pressures; or
- buried fire protection piping when in compliance with NFPA-24 (2010), *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*.

Testing of buried fire protection piping systems designed to the ASME piping code may be exempt from ASME pressure testing requirements if the pressure testing is performed to NFPA-24 (2010), *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*.

Authorized Inspection Agency

OPG shall arrange for the Authorized Inspection Agency inspectors to have access to all areas of the OPG facilities and records, and to the facilities and records of OPG's pressure boundary contractors and material organizations, as necessary for the purposes of performing inspections and other activities required by CSA Group standard N285.0-08 (including Updates No. 1 and No. 2).

OPG shall provide the inspectors of the Authorized Inspection Agency with: information, reasonable advance notice and time necessary to plan and perform inspections and other activities required by the standards.

Where a variance or deviation from the standard exists, OPG shall submit the proposed resolution to the Authorized Inspection Agency for evaluation. The evaluated resolution shall not be implemented without the prior written acceptance of the Commission or of a person authorized by the Commission.

Design registration services shall be provided by an Authorized Inspection Agency legally entitled under the Provincial boilers and pressure vessels Acts and regulations to register designs.

Guidance

Guidance Publications

Org	Doc #	Title
OPG	N-REF-01913.11-10001	Temporary Leak Maintenance by Leak Mitigation Process

SCA – FITNESS FOR SERVICE

Licence Condition 6.1 Fitness for Service Program

The licensee shall implement and maintain a fitness for service program.

Preamble

The SCA Fitness for Service covers activities that impact the physical condition of SSCs to ensure that they remain effective over time. Fitness for service includes programs that ensure equipment is available to perform its intended design function when called upon to do so.

This is accomplished by establishing an integrated set of programs and activities that ensure that safety performance requirements for critical SSCs are met on an ongoing basis. Aging management includes practices which address physical aging of SSCs as well as obsolescence issues as technology changes.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-STD-MP-0028	Conduct of Engineering	N
N-PROG-MP-0009	Design Management	N
N-PROG-MA-0026	Equipment Reliability	N
N-PROG-MP-0008	Integrated Aging Management	N
W-PROG-WM-0001	Nuclear Waste Management	Y
00044-PLAN-20670-00001	Welding Bay Walls Inspection Plan	Y
00104-PLAN-79171-00002	Ontario Power Generation Dry Storage Container – Base (Underside) Inspection Plan	Y
00104-PLAN-79171-00001	Used Fuel Dry Storage Container Aging Management Plan	Y

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CNSC	REGDOC-2.6.3	Aging Management	2014	Implemented

For nuclear-related SSCs, identified in accordance with OPG Program N-STD-MP-0028, *Conduct of Engineering*, OPG shall establish inspection, testing and maintenance programs required to ensure continued safe operation of the facility.

The licensee shall carry out in-service inspections of the welding bay walls in accordance with OPG plan 00044-PLAN-20670-00001, *Welding Bay Walls Inspection Plan*. The licensee shall carry out in-service inspections and aging management of dry storage containers (DSCs) in accordance with OPG plan 00104-PLAN-79171-00001, *Used Fuel Dry Storage Container Aging Management Plan*. The licensee shall carry out in-service inspections of the underside of the DSCs in accordance with OPG plan 00104-PLAN-79171-00002, *Ontario Power Generation Dry Storage Container – Base (Underside) Inspection Plan*. Every year, the licensee shall include and submit to CNSC staff the inspection results and their evaluations as part of the annual report.

Guidance

Guidance Publications

Org	Doc #	Title
IAEA	SSG-15	Storage of Spent Nuclear Fuel
CSA Group	N291	Requirements for safety-related structures for nuclear power plants
CNSC	REGDOC-2.6.2	Maintenance Programs for Nuclear Power Plants

The licensee should develop and implement life cycle management plans for nuclear safety related pressure boundary systems and components and an aging management plan for safety-related structures.

The life cycle management plans for nuclear safety related pressure boundary systems and components, and the aging management plan for safety-related structures should apply a systematic and integrated approach to establish, implement, and improve programs to manage aging and obsolescence of SSCs. The life cycle management plans should include structured, forward-looking inspection and maintenance schedules, requirements to monitor and trend aging effects and any preventative actions necessary to minimize and control aging degradation of the SSCs.

SCA – RADIATION PROTECTION

Licence Condition 7.1 Radiation Protection Program

The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

Preamble

The *Radiation Protection Regulations* require that the licensee implement a radiation protection program and also ascertain and record doses for each person who performs any duties in connection with any activity that is authorized by the NSCA or is present at a place where that activity is carried on. The radiation protection program must ensure that doses to workers do not exceed prescribed dose limits and are kept ALARA, social and economic factors being taken into account.

The regulatory dose limit to workers and the general public are explicitly provided in the *Radiation Protection Regulations*.

Action Levels (ALs) are designed to alert licensees before regulatory dose limits are reached. By definition, if an AL referred to in a licence is reached, a loss of control of some part of the associated radiation protection program may have occurred, and specific action is required, as defined in the *Radiation Protection Regulations* and the licence. ALs are not intended to be static and are to reflect operating conditions in the facility.

Specific regulatory requirements related to the implementation of all aspects of a radiation protection program, including ALs, are found in the *Radiation Protection Regulations*, *Class I Nuclear Facilities Regulations*, *General Nuclear Safety and Control Regulations*, and *Nuclear Substances and Radiation Devices Regulations*.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-REP-03420-10011	Occupational Radiation Protection Action Levels for Nuclear Waste Management Facilities	Y
N-PROG-RA-0013	Radiation Protection	Y
N-PROC-RA-0019	Dose Limits and Exposure Control	Y
N-PROC-RA-0027	Radioactive Work Planning, Execution and Close Out	N
N-MAN-03416-10000	Radiation Dosimetry Program – General Requirements	N

Doc #	Title	Prior Notice
N-MAN-03416.1-10000	Radiation Dosimetry Program – External Dosimetry	N
N-MAN-03416.2-10000	Radiation Dosimetry Program – Internal Dosimetry	N

A written report shall be submitted by the licensee to the Commission within 21 days of the licensee becoming aware that an AL has been reached.

The current ALs for the NSS-D are given in the following table. In the event of a discrepancy between the table below and the licensee documentation upon which they are based, the licensee documentation shall be considered the authoritative source.

Application	Action Level	Observations
DOSE TO WORKERS Individual worker external whole body radiation dose received on a job greater than planned.	0.5 mSv (50 mrem)	The AL is exceeded if a person receives an external whole-body dose that equals or exceeds 0.5 mSv above the Electronic Personal Dosimeter dose alarm set point in a shift.
WORKER EXPOSURE Individual worker receives a single intake of tritium oxide in which the unplanned component is estimated over a predetermined activity.	600 kBq/L (16 µCi/L)	The AL is exceeded if a person receives a single intake of tritium oxide (tritiated water) in which the unplanned component of the initial concentration immediately after intake is estimated to equal or exceed 600 kBq/L (16 µCi/L) (representing a nominal unplanned exposure of 0.5 mSv [50 mrem]).
WORKER EXPOSURE Individual worker receives an intake of a radionuclide other than tritium attributable to a single event that equals or exceeds a predetermined activity.	0.025 of an Annual Limit of Intake	The AL is exceeded if a person receives an intake of a radionuclide other than tritium (in the form of tritium oxide) attributable to a single event that equals or exceeds 0.025 of an Annual Limit of Intake as defined in International Commission on Radiation Protection (ICRP) 68 *Dose Coefficients for Intakes of Radionuclides by Workers* (representing a nominal unplanned exposure of 0.5 mSv [50 mrem]).
CONTAMINATION CONTROL Total surface contamination levels greater than a predetermined activity in Zone 1.	3.7×10^4 Bq/m^2 (1 µCi/m^2) (beta-gamma) 3.7×10^3 Bq/m^2 (0.1 µCi/m^2) (alpha)	The AL is exceeded if the total (fixed and loose) surface contamination levels greater than 3.7×10^4 Bq/m^2 (1 µCi/m^2) (beta-gamma) or 3.7×10^3 Bq/m^2 (0.1 µCi/m^2) (alpha) are found in Zone 1.

The licensee shall review and, if necessary, revise the ALs specified above at least once every five years in order to validate their effectiveness. The results of such reviews shall be provided to CNSC staff for review and acceptance. CNSC staff expect the ALs to be next reviewed, and revised if necessary, in 2027.

As stated in the email correspondence W-CORR-00531-01441 (e-Doc 5449221), the licensee shall incorporate the recommendations of CNSC staff with regards to ICRP-68 references in the next regular update of licensee document N-REP-03420-10011.

Guidance

Guidance Publications

Org	Doc #	Title
CNSC	REGDOC-2.7.1	Radiation Protection
CNSC	REGDOC-2.7.2	Dosimetry, Volume I: Ascertaining Occupational Dose

SCA – CONVENTIONAL HEALTH AND SAFETY

Licence Condition 8.1 Conventional Health and Safety Program

The licensee shall implement and maintain a conventional health and safety program.

Preamble

As of April 1, 1998, nuclear facilities owned and operated by Ontario Hydro were exempted from application of Part I, Part II, and Part III of the *Canada Labour Code*. This was established as per the following Consolidated Regulations: *SOR/98-179*, *SOR/98-180*, and *SOR/98-181*. The NSS-D is now regulated by the *Occupational Health and Safety Act of Ontario* and the *Labour Relations Act*. Should any inconsistencies arise between the provincial and federal legislations, the federal laws would prevail to the extent of the inconsistency.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
OPG-POL-0001	Employee Health and Safety Policy	N

The licensee has the prime responsibility for safety at all times. This responsibility cannot be delegated or contracted to another organization or entity. The licensee shall ensure that contractors and other organizations present on-site are informed of and uphold their roles and responsibilities related to conventional health and safety.

Guidance

Guidance Publications

Org	Doc #	Title
CNSC	REGDOC 2.8.1	Conventional Health and Safety

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SCA – ENVIRONMENTAL PROTECTION

Licence Condition 9.1 Environmental Protection

The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

Preamble

Licensees set Environmental Action Levels (EAL) and related parameters, so as to provide early warnings of any actual or potential losses of control of the environmental protection program. EALs are precautionary levels and are set far below the actual Derived Release Limits (DRL). EALs are designed to alert licensees before DRLs are reached. They are specific doses of radiation or other parameters that, if reached, may indicate a loss of control of the licensee's environmental protection program

The release of hazardous substances is regulated by the CNSC as well as both the Ontario Ministry of the Environment, Conservation and Parks (MECP) and Environment and Climate Change Canada (ECCC) through various acts and regulations.

The environmental protection SCA includes the following SpAs:

- Effluent and emissions control (releases);
- Environmental management system (EMS);
- Assessment and monitoring;
- Protection of people; and
- Environmental Risk Assessment.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
OPG-PROG-0005	Environmental Management System	N
OPG-POL-0021	Environmental Policy	N
N-PROC-OP-0025	Management of Environmental Monitoring Program	Y
N-STD-OP-0031	Monitoring of Nuclear and Hazardous Substances in Effluent	Y
NK38-REP-07701-00001	Darlington Nuclear Environmental Risk Assessment	Y

Doc #	Title	Prior Notice
NK38-REP-03482-10001	Derived Release Limits and Environmental Action Levels for Darlington Nuclear Generating Station	Y

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CNSC	REGDOC-2.9.1, Section 4.6	Environmental Protection: Environmental Principles, Assessments and Protection Measures	2016	Implemented
CNSC	REGDOC-2.9.1	Environmental Protection: Environmental Principles, Assessments and Protection Measures Version 1.1	2017	December 31, 2022
CSA Group	N288.1	Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities	2014	Implemented
CSA Group	N288.3.4	Performance testing of nuclear air-cleaning systems at nuclear facilities	2013	Implemented
CSA Group	N288.4	Environmental monitoring program at class I nuclear facilities and uranium mines and mills	2015	Implemented
CSA Group	N288.5	Effluent monitoring programs at class I nuclear facilities and uranium mines and mills	2011 (R2016)	Implemented
CSA Group	N288.6	Environmental risk assessments at class I nuclear facilities and uranium mines and mills	2012 (R2017)	Implemented
CSA Group	N288.7	Groundwater protection programs at Class I nuclear facilities and uranium mines and mills	2015	December 31, 2022
CSA Group	N288.8	Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities	2017	December 31, 2023

Effluent and Emissions Control (Releases)

The licensee shall ensure effluent monitoring for nuclear and hazardous substances is designed, implemented and managed to respect applicable laws and to incorporate best practices. The effluent monitoring program shall provide for control of airborne and waterborne effluents. Effluent monitoring is a risk-informed activity, which assures quantifying of the important releases of the nuclear and hazardous substances into the environment.

Nuclear Substances – Derived Release Limits (DRL)

The licensee shall control radiological releases to ALARA, within the DRLs, and take action to investigate cause(s) and correct the cause(s) of increased releases.

If any of the individual DRLs are exceeded, or if the sum of individual releases (expressed as a fraction of the relevant DRL) exceeds unity, it indicates that the licensee is in non-compliance with the public dose limit of 1 mSv/year as per the *Radiation Protection Regulations*.

The DRLs are considered part of the licensing basis. Changes to these limits are subject to LC G.1. The DRLs for this facility are summarized in the table below. In the event of a discrepancy between the table below and the licensee documentation upon which they are based, the licensee documentation shall be considered the authoritative source (assuming that the licensee has followed its own change control process).

Release Category	Radionuclide	DRL (Becquerel/year)
Air	Tritium (HTO)	4.94E+16
	Elemental Tritium (HT)	8.23E+17
	Iodine (mixed fission products)	1.77E+12
	Carbon-14	1.21E+15
	Noble Gases[1]	3.80E+16
	Particulate – Gross Beta-Gamma	6.06E+11
	Particulate – Gross Alpha	1.08E+11
Water	Tritium	6.43E+18
	Carbon-14	6.97E+14
	Gross Alpha	4.39E+11
	Gross Beta-Gamma	3.47E+13

[1]Noble gases DRL/EAL is in units of Bq-MeV.
Note: The NSS-D uses the DRLs established for the Darlington Site.

These DRLs for radionuclides and radionuclide groups account for the most significant releases and are the focus of monitoring and reporting requirements.

Nuclear Substances – Environmental Action Levels (EAL)

OPG must develop and implement EALs. The EALs are considered part of the licensing basis. Changes to these limits are subject to LC G.1. The EALs for this facility are summarized in the table below. In the event of a discrepancy between the table below and the licensee documentation upon which they are based, the licensee documentation shall be considered the authoritative source (assuming that the licensee has followed its own change control process).

Further to the requirements of LC 3.2, OPG shall notify the Commission within seven days of becoming aware that an action level has been reached.

The current EALs for NSS-D are given in the following table:

Release Category	Radionuclide	EALs: Gaseous Releases (Becquerel/week)
Air	Tritium (HTO)	9.88E+13
	Elemental Tritium (HT)	1.65E+15
	Iodine	3.53E+9
	Carbon-14	2.42E+12
	Noble Gases[1]	7.60E+13
	Particulate – Gross Beta-Gamma	1.21E+09
Release Category	**Radionuclide**	**EALs: Liquid Releases (Becquerel/month)**
Water	Tritium (HTO)	5.14E+16
	Carbon-14	5.58E+12
	Gross Beta-Gamma	2.77E+11

[1]Noble gases DRL/EAL is in units of Bq-MeV.
Note: EAL for gross alpha is not specified since it is not a routinely monitored radionuclide group at the Darlington Nuclear Generating Station (DNGS) or NSS-D because its activity is below the threshold value specified in the standard for radioactivity monitoring in effluents.
Note: These EALs are for the Darlington site which includes the DNGS and the NSS-D.

Hazardous Substances

The licensee shall control hazardous substance releases according to the limits defined in accordance with the applicable environmental compliance approvals, provincial and other federal legislation and take action to investigate and correct the cause(s) of increased releases.

Environmental Management System (EMS)

The objective of the environmental protection policies, programs and procedures is to establish adequate provisions for protection of the environment. This shall be accomplished through an integrated set of documented activities of an environmental management system (EMS).

The licensee shall implement and maintain an environmental management program to assess environmental risks associated with its nuclear activities, and to ensure these activities are conducted in such a way that adverse environmental effects are prevented or mitigated.

The licensee shall ensure that all aspects of its environmental management program are effectively implemented in order to assure compliance with environmental regulatory requirements and expectations, including those set in the International Organization for Standardization 14001, *Environmental Management Systems*. The licensee's EMS is registered to the ISO-14001. Having the ISO-14001certification is not part of the CNSC requirement; however, it shows that a third party recognized OPG Environmental Management System as being in accordance with the standard.

Assessment and Monitoring

An environmental monitoring program consists of a risk-informed set of integrated and documented activities to sample, measure, analyze, interpret, and report the following:

- the concentration of hazardous and/or nuclear substances in environmental media to assess one or both of
  - exposure of receptors to those substances; and
  - the potential effects on human health, safety, and the environment;
- the intensity of physical stressors and/or their potential effect on human health and the environment; and
- the physical, chemical, and biological parameters of the environment normally considered in design of the EMP.

Protection of people

This aspect relates to the assessment of predicted human health effects measured and potential quantities of hazardous substance in the environment (abiotic and biotic) of the NSS-D. This aspect is linked to the Dose to the public SPA as well as the Environmental Risk Assessment SPA and addressed mainly under LC G.1 (Licensing Basis)

Environmental Risk Assessment

In accordance with CSA N288.4 and N288.5, the ERA establishes the basis for both the environmental monitoring program and the effluent monitoring program. The ERA shall be updated periodically with the results from the environmental and effluent monitoring programs to confirm the effectiveness of any additional mitigation measures needed.

OPG Darlington's ERA is a site wide ERA encompassing DNGS and NSS-D and shall be compliant with CSA N288.6 *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills.*

Guidance

Guidance Publications

Org	Doc #	Title
CNSC	REGDOC 2.7.1	Radiation Protection
CNSC	REGDOC 2.9.1	Environmental Protection: Environmental Principles, Assessments and Protection Measures, Version 1.2
CSA	N288.1-2020	Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities
CSA	N288.2	Guidelines for Calculating the Radiological Consequences to the Public of a Release of Airborne Radioactive Material for Nuclear Reactor Accidents

It is recommended that the licensee provide to the CNSC a copy of the reports sent to the MECP and ECCC on hazardous releases.

SCA – EMERGENCY MANAGEMENT AND FIRE PROTECTION

Licence Condition 10.1 Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

Preamble

Emergency management covers emergency plans and emergency preparedness programs which exist for emergencies and for non-routine conditions. It also includes any results of exercise participation.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-STD-RA-0036	Radioactive Materials Transportation Emergency Response Plan	N
N-PROG-RA-0001	Consolidated Nuclear Emergency Plan	Y

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CNSC	REGDOC-2.10.1	Nuclear Emergency Preparedness and Response, Version 2	2016	Implemented

OPG's nuclear emergency preparedness program is documented in the *Consolidated Nuclear Emergency Plan* (CNEP). The CNEP governs the DNGS site, where the NSS-D is located. The CNEP deals with emergency situations that may pose a risk to on-site staff, the environment and the public. The NSS-D has specific procedures to deal with facility specific emergencies and the interface with both DNGS Emergency Response resources and the Municipality of Clarington Emergency and Fire Services.

A memorandum of understanding (MOU), dated January 1, 2014 exists for the provision of fire protection services; including, fire safety planning, fire inspections, and coordinated emergency response between the Municipality of Clarington and OPG Darlington Nuclear, including the NSS-D.

Guidance

None provided.

Licence Condition 10.2 Fire Protection Program

The licensee shall implement and maintain a fire protection program.

Preamble

Licensees require a comprehensive fire protection program to ensure the licensed activities do not result in unreasonable risk to the health and safety of persons and to the environment due to fire and to ensure that the licensee is able to efficiently and effectively respond to emergency fire situations.

Fire protection provisions, including response, are required for the design, construction, commissioning, operation, maintenance, and decommissioning of nuclear facilities. Fire provisions cover structures, systems, and components that support the plant operation and extend within the exclusion area. External events, such as an aircraft crash or threats, are addressed by LC 12.1.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-PROG-RA-0012	Fire Protection	Y

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CSA Group	N393	Fire protection for facilities that process, handle, or store nuclear substances	2013 (R2018)	Implemented
CSA Group	N393	Fire protection for facilities that process, handle, or store nuclear substances	2022	TBD*
NRC	N/A	National Building Code of Canada (2010)	2010	Implemented
NRC	N/A	National Building Code of Canada (2015)	2015	December 1, 2022
NRC	N/A	National Building Code of Canada (2020)	2020	TBD*
NRC	N/A	National Fire Code of Canada (2010)	2010	Implemented
NRC	N/A	National Fire Code of Canada (2015)	2015	December 1, 2022
NRC	N/A	National Fire Code of Canada (2020)	2020	TBD*

The licensee shall submit the results of the facility condition inspection and the fire protection audit as per the intervals outlined in CSA Group standard N393, *Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances*.

The licensee shall submit the update or reaffirmation of the Fire Hazard Assessment as per the intervals outlined in CSA Group standard N393, *Fire Protection for Facilities That Process, Handle, or Store Nuclear Substances.*

Guidance

None provided.

SCA – WASTE MANAGEMENT

Licence Condition 11.1 Waste Management Program

The licensee shall implement and maintain a waste management program.

Preamble

The "waste management" safety and control area covers internal waste-related programs that form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility. This area also covers the planning for decommissioning.

CNSC Regulatory Document REGDOC-2.11, *Framework for Radioactive Waste Management and Decommissioning in Canada* defines radioactive waste as any material (liquid, gaseous or solid) that contains a radioactive "nuclear substance," as defined in section 2 of the NSCA, and which the owner has declared to be waste. In addition to containing nuclear substances, radioactive waste may also contain non-radioactive "hazardous substances," as defined in section 1 of the *General Nuclear Safety and Control Regulations*.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-PROC-RA-0017	Segregation and Handling of Radioactive Waste	N
OPG-STD-0156	Management of Waste and Other Environmentally Regulated Materials	N
W-PROG-WM-0001	Nuclear Waste Management	Y

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CNSC	REGDOC 2.11.1	Waste Management Volume 1: Management of Radioactive Waste	2021	Implemented*
CSA Group	N292.0	General principles for the management of radioactive waste and irradiated fuel	2019	Implemented
CSA Group	N292.2	Interim dry storage of irradiated fuel	2013	Implemented
CSA Group	N292.3	Management of low- and intermediate-level radioactive waste	2014	Implemented

*OPG is compliance with REGDOC 2.11.1 volume 1 with the exception of clause 10.5 on Decommissioning. Once REGDOC 2.11.2 has been implemented OPG will be fully compliant with REGDOC 2.11.1 Volume I.

OPG shall characterize its waste streams and minimize the production of all wastes taking into consideration the health and safety of workers and the environment, integrate waste management programs as a key element of the facility's safety culture, and regularly audit its program to maximize its efficiency.

With respect to the storage and management of spent nuclear fuel, the waste management program should reflect the fundamental safety concerns related to criticality, exposure, heat control, containment, and retrievability. That is, the systems that are designed and operated should assure subcriticality, control of radiation exposure, assure heat removal, assure containment, and allow retrievability.

Guidance

Guidance Publications

Org	Doc #	Title
CNSC	REGDOC-2.11	Framework for Radioactive Waste Management and Decommissioning in Canada
CSA Group	N292.8	Characterization of radioactive waste and irradiated fuel

The CNSC expects that OPG will implement and audit a facility and waste stream-specific waste management program to control and minimize the volume of radioactive waste generated by the licensed activity. Inclusion of a waste management program is a key component of the licensee's safety culture.

Licence Condition 11.2 Decommissioning Plan

The licensee shall maintain a preliminary decommissioning plan.

Preamble

Paragraph 3(k) of the *Class I Nuclear Facilities Regulations* requires that a licence application contain the proposed plan for the decommissioning of the nuclear facility.

This LC requires that the licensee maintain, at this point in the life cycle, a Preliminary Decommissioning Plan (PDP).

A PDP provides an overview of the proposed decommissioning approach that is sufficiently detailed to assure that the proposed approach is, in light of existing knowledge, technically and financially feasible, and appropriate in the interests of health, safety, security and the protection of the environment. The PDP defines areas to be decommissioned and the general structure and sequence of the principle work packages. The PDP forms the basis for establishing and maintaining a financial arrangement (financial guarantee – see LC G.3) that will assure adequate funding of the decommissioning plan.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
W-PROG-WM-0003	Decommissioning Program	Y
00044-PLAN-00960-00001	Preliminary Decommissioning Plan Darlington Waste Management Facility	Y

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CSA Group	N294	Decommissioning of facilities containing nuclear substances	2019	Implemented
CNSC	G-219	Decommissioning planning for licensed activities	2000	Implemented
CNSC	REGDOC 2.11.2	Decommissioning	2021	TBD*

*OPG has committed to submitting a gap analysis and implementation plan for REGDOC 2.11.2, *Decommissioning* by March 17, 2023.

The PDP is to be kept current to reflect any changes in the site or nuclear facility. The PDP is to be revised at a minimum every five years or when required by the Commission.

The PDP was last revised and submitted to the CNSC in 2022. OPG's next scheduled submission of the PDP for the NSS-D is due to the CNSC in 2027.

Guidance

None provided.

SCA – SECURITY

Licence Condition 12.1 Security Program

The licensee shall implement and maintain a security program.

Preamble

Nuclear security puts in place provisions to prevent, detect and stop malevolent acts, such as theft, sabotage, unauthorized access, illegal transfer or other acts involving nuclear material, other radioactive substances or their associated facilities.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
00044-REP-08160-00001	Darlington Waste Management Facility Security Report	N
NK38-REP-08160.3-00001	Threat and Risk Assessment	N
N-PROG-RA-0011	Nuclear Security	Y
N-PROC-RA-0135	Cyber Security	N

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CNSC	REGDOC-2.2.4	Fitness for Duty, Volume III: Nuclear Security Officer Medical, Physical, and Psychological Fitness	2018	Implemented
CNSC	REGDOC-2.12.1	High-Security Facilities, Volume I: Nuclear Response Force, Version 2	2018	TBD*
CNSC	REGDOC-2.12.1	High-Security Facilities, Volume II: Criteria for Nuclear Security Systems and Devices	2018	Implemented
CNSC	REGDOC-2.12.2	Site Access Security Clearance	2013	Implemented

*OPG has committed to submitting a gap analysis and implementation plan for REGDOC-2.12.1, *High-Security Facilities, Volume I: Nuclear Response Force, Version 2* by February 28, 2023.

The licensee shall ensure the identified vital areas within the nuclear facility are protected against design basis threats and any other credible threat identified in their threat and risk assessment documentation. The prime functions that must be maintained at the NSS-D to prevent unacceptable radiological consequences are those of control, and contain.

The licensee shall maintain the operation, design and analysis provisions credited in the above assessments as required to ensure adequate engineered safety barriers for the protection against malevolent acts. The provisions for the protection against malevolent acts shall be documented as part of a managed sub program or process within the management system. The licensee shall summarize changes in design, analysis or operation procedures that are credited for the protection against malevolent acts in the annual threat and risk assessment, and submit a copy to the Commission upon request.

The licensee shall implement measures for the purpose of preventing and detecting unauthorized entry into a protected area or inner area at a high-security site, including:

- vehicle barriers and vehicle access control points;
- perimeter intrusion detection systems and devices;
- closed-circuit video systems/devices for applications in a protected area or inner area;
- security monitoring rooms; and,
- security monitoring room systems and devices.

The licensee shall design, implement and maintain a cyber-security program to protect cyber assets that performs or impacts nuclear safety, nuclear security, emergency preparedness or safeguard functions from cyber attacks.

The licensee shall file an update of the security report with the CNSC a minimum of six months before the operating licence expires. If the site security program changes at any time, it must be brought to the attention of the CNSC Director of the Nuclear Security Division. The changes will then be assessed to determine if the report requires an immediate update or if the update can wait until the relicensing review.

Guidance

Guidance Publications

Org	Doc #	Title
CNSC	REGDOC-2.12.3	Security of Nuclear Substances: Sealed Sources and Category I, II, and III Nuclear Material, Version 2.1
CSA	N290.7	Cyber Security for Nuclear Facilities
IAEA	Nuclear Security Series No. 17-T Technical Guidance	Computer Security Techniques for Nuclear Facilities

Org	Doc #	Title
IAEA	Nuclear Security Series No. 33-T Technical Guidance	Computer Security of Instrumentation and Control Systems at Nuclear Facilities
IAEA	Nuclear Security Series No. 4 Technical Guidance	Engineering Safety Aspects of the Protection of Nuclear Power Plants Against Sabotage
IAEA	Nuclear Security Series No. 13 Recommendations	Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities

Licence Condition 12.2 Construction

The licensee shall not carry out the activities referred to in paragraph (ii) of Part IV of this licence that relates to completed construction activities in paragraph (iv) of Part IV of this licence until the submission of the proposed security arrangements and measures for the new structure, or any potential modifications to the protected area that may be associated with this new structure, that is acceptable to the Commission or a person authorized by the Commission.

Preamble

None provided.

Compliance Verification Criteria

The operating licence authorizes the construction and operation of additional storage structures at the NSS-D. This LC requires that OPG submit the proposed security arrangements and measures for the new structure, or any potential modifications to the protected area that may be associated with the new structure prior to receiving CNSC authorization to operate these structures under licence condition 15.2.

CNSC staff will confirm that acceptable security arrangements have been submitted prior to authorizing OPG to begin operations at the new storage structures.

Delegation of Authority

The statement “or a person authorized by the Commission” reflects to whom the Commission has delegated certain authority. The delegation of authority by the Commission to act as a “person authorized by the Commission” is applied to the incumbents of the following positions:

- Director, Wastes and Decommissioning Division;
- Director General, Directorate of Nuclear Cycle and Facilities Regulations; and,
- Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch.

Guidance

None provided.

SCA – SAFEGUARDS AND NON-PROLIFERATION

Licence Condition 13.1 Safeguards Program

The licensee shall implement and maintain a safeguards program.

Preamble

Canada has entered into a Safeguards Agreement and an Additional Protocol (hereafter referred to as "safeguards agreements") with the IAEA pursuant to its obligations under the *Treaty on the Non-Proliferation of Nuclear Weapons* (INFCIRC/140). The objective of the Canada-IAEA safeguards agreements is for the IAEA to provide assurance on an annual basis to Canada and to the international community that all declared nuclear materials are in peaceful, non-explosive uses and that there is no indication of undeclared nuclear materials or activities. This conclusion confirms that Canada is in compliance with its obligations under the following Canada-IAEA safeguards agreements:

- *Agreement Between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*; and
- *Protocol Additional to the Agreement between Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*.

These are reproduced in *INFCIRC/164*, and *INFCIRC/164/Add. 1*.

The scope of the non-proliferation program carried out under this licence is limited to tracking and reporting of foreign obligations and origins of nuclear material. Additionally, the import and export of controlled nuclear substances, equipment and information identified in the *Nuclear Non-proliferation Import and Export Control Regulations* require separate authorization from the CNSC, consistent with section 3(2) of the *General Nuclear Safety and Control Regulations*.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
N-PROG-RA-0015	Nuclear Safeguards	Y
N-STD-RA-0024	Nuclear Safeguards Implementation	Y
N-PROC-RA-0136	OPG Safeguards and Nuclear Material Accountancy Requirements	N

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CNSC	REGDOC-2.13.1	Safeguards and Nuclear Material Accountancy	2018	Implemented

The licensee shall not make changes to operation, equipment or procedures that would affect the implementation of safeguards measures, except with the prior written approval of the Commission or a person authorized by the Commission.

With respect to the implementation of safeguards measures, changes made by the licensee to operation, equipment or procedures as of the result of agreements between the licensee, the CNSC and the IAEA are considered routine.

If a requested change would adversely impact Canada's compliance with its safeguards agreements, CNSC staff do not have the authority to give approval, as this would violate the obligations arising from the Canada-IAEA safeguards agreement.

To avoid a potential non-compliance with REGDOC-2.13.1, section 8.1.1, when the Nuclear Material Accountancy Reporting (NMAR) e-business system is not available, OPG is to contact the CNSC International Safeguards Division (cnsc.sg.official.ccsn@canada.ca) to inform them of the issue and to seek guidance on how to fulfill reporting requirements. When OPG inventory change documents and physical-key measurement point inventory summaries are submitted using an alternative method, OPG will still be required to re-submit using the NMAR e-business system once the NMAR system becomes available. For additional information see CNSC letter e-Doc 6039874.

Delegation of Authority

The statement "or a person authorized by the Commission" reflects to whom the Commission has delegated certain authority. The delegation of authority by the Commission to act as a "person authorized by the Commission" is applied to the incumbents of the following positions:

- Director, International Safeguards Division;
- Director General, Directorate of Security and Safeguards; and,
- Vice-President, Technical Support Branch.

Guidance

None provided.

SCA – PACKAGING AND TRANSPORT

Licence Condition 14.1 Packaging and Transport Program

The licensee shall implement and maintain a packaging and transportation program.

Preamble

Transport of nuclear substances is subject to the *Transport of Dangerous Goods Regulations* (TDGR) and the *Packaging and the Transport of Nuclear Substances Regulations (2015)* (PTNSR).

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Doc #	Title	Prior Notice
W-PROG-WM-0002	Radioactive Material Transportation	N
N-STD-RA-0036	Radioactive Materials Transportation Emergency Response Plan	N
N-PROG-RA-0013	Radiation Protection	Y

The licensee shall implement and maintain a packaging and transport program that will ensure compliance with the requirements of the TDGR and the PTNSR, 2015.

Guidance

Guidance Publications

Org	Doc #	Title
CNSC	REGDOC-2.14.1	Volume 1, Information Incorporated by Reference in Canada's Packaging and Transport of Nuclear Substances Regulations, 2015, Version 2.

FACILITY-SPECIFIC

Licence Condition 15.1 Construction Plans

The licensee shall not carry out the activities referred to in paragraph (iv) of Part IV of this licence until the submission of an environmental management plan, a construction verification plan, the project design requirements and a preliminary safety analysis report without prior approval of a person authorized by the Commission.

Preamble

None provided.

Compliance Verification Criteria

Licensing Basis Publications

Org	Doc #	Title	Version	Effective Date
CSA Group	N393	Fire protection for facilities that process, handle, or store nuclear substances	2013 (R2018)	Implemented
NRC	N/A	National Building Code of Canada	2020	Implemented
NRC	N/A	National Fire Code of Canada	2020	Implemented

CNSC staff will confirm that both an environmental management plan and a construction verification plan are in effect prior to the commencement of construction activities as authorized in paragraph (iv) of Part IV of this licence.

CNSC staff will confirm that appropriate design requirements have been developed and preliminary safety analysis has been conducted and submitted to the CNSC prior to the onset of construction activities. These design requirements will comply with the NRC *National Fire Code of Canada (2020)*, NRC *National Building Code of Canada (2020)*, and CSA Group standard N393, *Fire Protection for Facilities That Process, Handle, or Store Nuclear Substances (R2018)*. Furthermore, the licensee must demonstrate that any design changes remain within the Commission approved licensing basis.

Delegation of Authority

The statement "or a person authorized by the Commission" reflects to whom the Commission has delegated certain authority. The delegation of authority by the Commission to act as a "person authorized by the Commission" is applied to the incumbents of the following positions:

- Director, Wastes and Decommissioning Division;
- Director General, Directorate of Nuclear Cycle and Facilities Regulations; and,
- Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch.

Guidance

None provided.

Licence Condition 15.2 Commissioning Report

The licensee shall not carry out the activities referred to in paragraph (ii) of Part IV of this licence that relate to completed construction activities in paragraph (iv) of Part IV of this licence until the submission of a commissioning report that is acceptable to the Commission or a person authorized by the Commission.

Preamble

None provided.

Compliance Verification Criteria

The Commission, or a person authorized by the Commission, will confirm that an acceptable commissioning report has been submitted prior to authorizing OPG to begin operations at any new structures. Upon review and acceptance of the commissioning report, the Commission or a person authorized by the Commission, will provide formal notification that OPG is authorized to begin operations at the new structure.

Delegation of Authority

The statement "or a person authorized by the Commission" reflects to whom the Commission has delegated certain authority. The delegation of authority by the Commission to act as a "person authorized by the Commission" is applied to the incumbents of the following positions:

- Director, Wastes and Decommissioning Division;
- Director General, Directorate of Nuclear Cycle and Facilities Regulations; and,
- Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch.

Guidance

None provided.

APPENDIX A: CHANGE CONTROL PROCESS

A change control process has been developed for revisions to the LCH to ensure that preparation and use of it is controlled and that all references are identified and maintained. A request to change this document can be initiated by either CNSC staff or the licensee. The change will be assessed by CNSC staff as follows:

The change request will be documented using the change request form;

The review will be coordinated by the project officer and appropriate specialists will be consulted for concurrence;

Approval will be obtained from the Director WDD, the DG Directorate of Nuclear Cycle and Facilities Regulation (DNCFR) or the Executive Vice-President and Chief Regulatory Operations Officer (EVP Ops), as appropriate;

The licensee will be consulted on the proposed changes;

If a dispute related to the proposed changes exists between the licensee and CNSC staff, the following process will be followed:

5.1. A meeting will be scheduled between the parties;

5.2. The decision and its rationale will be discussed and documented; and

5.3. If either party is not satisfied with the decision, the next stage of the process will be initiated as follows:

5.3.1. A decision will be made by the Director WDD. If the decision is not satisfactory, it will be submitted to the DG DNCFR for resolution; or,

5.3.2. A decision will be made by the DG DNCFR. If the decision is not satisfactory, it will be submitted to the EVP Ops for resolution; or,

5.3.3. A decision will be made by the EVP Ops. If the decision is not satisfactory, it will be submitted to the Commission for resolution during a Commission Meeting. A final decision will be made by the Commission.

The LCH will be revised and formally approved by the Director WDD, the DG DNCFR or the EVP Ops, as appropriate;

All changes to the LCH and any supporting information will be archived in the CNSC Records Office;

The document revision history will be revised in the Revision History section of the LCH; and,

A copy of the amended version of the LCH will be provided to the licensee and made available to CNSC staff.

Change Request Form

1. GENERAL INFORMATION			
File Plan #		**e-Doc #(s) for Change Request Form**	
Licensee	**Licence Number**	**LCH #, Rev/Version**	**Request Date**
Licensing Officer			

2. CHANGE(S) TO THE LCH			
#	**Description and Purpose**	**Proposed Change**	**References**
1	<initiator, nature, reason for change, e.g., administrative, change to a licensee doc, etc.>	<identify modifications, such as by track changes, highlighting, etc.>	<LC, page, section #, etc.>
2			

3. ASSESSMENT (text and/or e-Doc #s)			
#	**Division/Org**	**Comment**	**Disposition**
1	<division>		
	<division>		
	<licensee>		
	<division>		
2	etc.		

4. CONSENT TO MODIFY		
#	**Agreed**	**Comment**
1		
2		

Name	**Title**	**Signature**	**Date**

5. LCH DOCUMENTATION AND DISTRIBUTION			
New LCH Number	**LCH Effective Date**	**e-Doc #** (include version number)	
CNSC Outgoing Notification		**e-Doc #**	**Date Sent**

APPENDIX B: DEFINITIONS AND ACRONYMS

DEFINITIONS

Accept	Accept means to indicate compliance with requirements.
Acceptable	Acceptable means to meet the requirements of CNSC staff.
Action Level	A specific dose of radiation or other parameter that, if reached, may indicate a loss of control of part of a licensee's radiation protection program and triggers a requirement for specific action to be taken (*Radiation Protection Regulations*; Glossary of CNSC Terminology).
Approval	Approval means the granting of consent by a regulatory body. Typically used to represent any form of consent from the regulatory body that does not meet the definition of authorization (IAEA Glossary).
Authorization	Authorization means the granting by a regulatory body or other governmental body of written permission for an operator to perform specified activities (IAEA Glossary): • Authorization could include, for example, licensing, certification, or registration. • The term authorization is also sometimes used to describe the document granting such permission. • Authorization is normally a more formal process than approval.
Boundary Conditions	The values of variables in a mathematical model that are assumed at the spatial bounds of the model (Glossary of CNSC Terminology).
Defence in Depth	A hierarchical deployment of different levels of diverse equipment and procedures to prevent the escalation of anticipated operational occurrences and to maintain the effectiveness of physical barriers placed between a radiation source or radioactive material and workers, members of the public or the environment, in operational states and, for some barriers, in accident conditions (Glossary of CNSC Terminology).
Design Basis	The range of conditions and events taken explicitly into account in the design of a nuclear facility, according to established criteria, such that the facility can withstand this range without exceeding authorized limits. Note: Design extension conditions are not part of the design basis (Glossary of CNSC Terminology).

Graduated Use of Force	The application of approved response force options following the RCMP incident management/intervention model or approved equivalent provincial police model (Glossary of CNSC Terminology).
Hazardous Substance	A substance, other than a nuclear substance, that is used or produced in the course of carrying on a licensed activity and that may pose a risk to the environment or the health and safety of persons (*Class II Nuclear Facilities and Prescribed Equipment Regulations*; *Uranium Mines and Mills Regulations*, Glossary of CNSC Terminology).
Licensing Basis	A set of requirements and documents for a regulated facility or activity comprising: • the regulatory requirements set out in the applicable laws and regulations; • the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence; and, • the safety and control measures described in the licence application and the documents needed to support that licence application. (Glossary of CNSC Terminology).
Management System	The framework of processes, procedures and practices used to ensure that an organization can fulfill all tasks required to achieve its objectives safely and consistently. Note: The management system integrates all elements of an organization into one coherent system to enable all of the organization's objectives to be achieved. These elements include the structure, resources and processes. Personnel, equipment and organizational culture, as well as the documented policies and processes, are parts of the management system (Glossary of CNSC Terminology).
Notice of Non-Compliance	A notice of non-compliance (NNC) is issued when a non-compliance with the compliance CVC is confirmed through objective evidence obtained from reliable sources and based on verifiable facts. A NNC requires the licensee to take the necessary action(s) to correct the identified non-compliance and respond with one of the following: • confirmation that compliance has been restored • a timeframe for restoring compliance • a timeframe within which a corrective action plan will be submitted

Notification	The submission of information by the licensee to CNSC staff.
Order	One of the regulatory tools the CNSC uses to compel someone to do something in the interests of health, safety, the environment, national security or compliance with Canada's international obligations. Failure to comply with an order can lead to further regulatory measures, including prosecution or licensing actions (Glossary of CNSC Terminology).
Person Authorized by the Commission	Person authorized by the Commission means the Director WDD, the DG DNCFR, or EVP Ops of the CNSC, unless otherwise specified.
Qualified Staff	Trained licensee staff, deemed competent and qualified to carry out tasks associated to their respective positions.
Recommendation	A written suggestion for improvement relating to good industry practice or the promotion of good performance.
Safe Direction	Safe direction means changes in facility safety levels which would not potentially result in: • a reduction in any safety margin; • a breakdown of barriers; • an increase (in certain parameters) above accepted limits; • an increase in risk; • impairments of special safety systems; • an increase in the risk of radioactive releases or spills of hazardous substances; • injuries to workers or members of the public; • introduction of a new hazard; or, • a reduction of the facility's defence in depth provisions.
Shall	For the purpose of this handbook, "shall" is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with a CSA Group standard.
Worker	A person who performs work that is referred to in a licence (Glossary of CNSC Terminology).

ACRONYMS

The following is the list of acronyms used in this document:

µCi	Microcurie
AIA	Authorized Inspection Agency
AL	Action Level
ALARA	As Low As Reasonably Achievable
ASME	American Society of Mechanical Engineers
Bq	Becquerel
CANDU	CANada Deuterium Uranium
CMD	Commission Member Document
CNEP	Consolidated Nuclear Emergency Plan
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
cUL	Underwriters Laboratories Inc. (‘c’ meets Canadian requirements)
CVC	Compliance Verification Criteria
DG	Director General
DNCFR	Directorate of Nuclear Cycle and Facilities Regulation
DNGS	Darlington Nuclear Generating Station
DRL	Derived Release Limit
DSC	Dry Storage Container
EA	Environmental Assessment
EAL	Environmental Action Level
ECCC	Environment and Climate Change Canada
EMS	Environmental Management System
EVP Ops	Executive Vice-President and Chief Regulatory Operations Officer
FG	Financial Guarantee
IAEA	International Atomic Energy Agency

ICRP	International Commission on Radiation Protection
INFCIRC	INFormation CIRCular
LC	Licence Condition
LCH	Licence Conditions Handbook
MECP	Ministry of the Environment, Conservation and Parks
MOU	Memorandum of Understanding
mSv	Millisievert
NFPA	National Fire Protection Association
NMAR	Nuclear Material Accountancy Reporting
NNC	Notice of Non-Compliance
NRC	National Research Council Canada
NSCA	*Nuclear Safety and Control Act*
NSS-D	Nuclear Sustainability Services - Darlington
ONFA	Ontario Nuclear Funds Agreement
OPEX	Operating Experience
OPG	Ontario Power Generation
PDP	Preliminary Decommissioning Plan
PIDP	Public Information and Disclosure Program
PTNSR	*Packaging and the Transport of Nuclear Substances Regulations*
SCA	Safety and Control Area
SSC	Systems, Structures and Components
TDGR	*Transport of Dangerous Goods Regulations*
WDD	Wastes and Decommissioning Division
WFOL	Waste Facility Operating Licence

APPENDIX C: LIST OF LICENSING BASIS PUBLICATIONS

Doc #	Title	Version	LC
American Society of Mechanical Engineers Documents			
B31.1	Power Piping	2010	5.2
Canadian Nuclear Safety Commission Documents			
REGDOC-3.3.1	Financial Guarantees for the Decommissioning of Nuclear Facilities and Termination of Licensed Activities	2021	G.3
REGDOC 3.2.1	Public Information and Disclosure	2018	G.4, 3.2
REGDOC-2.2.4	Fitness for Duty: Managing Worker Fatigue	2017	2.1
REGDOC-2.2.4	Fitness for Duty, Volume II: Managing Alcohol and Drug Use, version 3	2021	2.1
REGDOC-2.1.2	Safety Culture	2018	2.1
REGDOC-2.2.2	Personnel Training	2016	2.2
REGDOC 3.1.2	Reporting Requirements, Volume 1: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	2018	3.2
REGDOC-2.6.3	Aging Management	2014	6.1
REGDOC-2.9.1	Environmental Protection: Environmental Principles, Assessments and Protection Measures	Section 4.6, 2016	9.1
REGDOC 2.9.1	Environmental Protection: Environmental Principles, Assessments and Protection Measures Version 1.1	2017	9.1
REGDOC-2.10.1	Nuclear Emergency Preparedness and Response, Version 2	2016	10.1
REGDOC-2.11.1	Waste Management Volume 1: Management of Radioactive Waste	2021	11.1
G-219	Decommissioning planning for licensed activities	2000	11.2
REGDOC 2.11.2	Decommissioning	2021	11.2
REGDOC-2.2.4	Fitness for Duty, Volume III: Nuclear Security Officer Medical, Physical, and Psychological Fitness	2018	12.1

Doc #	Title	Version	LC
REGDOC 2.12.1	High-Security Facilities, Volume II: Criteria for Nuclear Security Systems and Devices	2018	12.1
REGDOC 2.12.1	High-Security Facilities, Volume II: Criteria for Nuclear Security Systems and Devices, Version 2	2018	12.1
REGDOC-2.12.2	Site Access Security Clearance	2013	12.1
REGDOC-2.13.1	Safeguards and Nuclear Material Accountancy	2018	13.1
Canadian Standards Association Group Documents			
N286	Management system requirements for nuclear facilities	2012 (R2017)	1.1
N286.7	Quality assurance of analytical, scientific, and design computer programs	2016	4.1
B51	Boiler, pressure vessel, and pressure piping code	2009 and Update No. 1	5.2
N285.0	General requirements for pressure-retaining systems and components in CANDU nuclear power plants	2008 and Updates No. 1 and 2; and Annex N of N285.0-12 and Update No. 1	5.2
N288.1	Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities	2014	9.1
N288.3.4	Performance testing of nuclear air-cleaning systems at nuclear facilities	2013	9.1
N288.4	Environmental monitoring program at class I nuclear facilities and uranium mines and mills	2015	9.1
N288.5	Effluent monitoring programs at class I nuclear facilities and uranium mines and mills	2011 (R2016)	9.1
N288.6	Environmental risk assessments at class I nuclear facilities and uranium mines and mills	2012 (R2017)	9.1

Doc #	Title	Version	LC
N288.7	Groundwater protection programs at Class I nuclear facilities and uranium mines and mills	2015	9.1
N288.8	Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities	2017	9.1
N292.0	General principles for the management of radioactive waste and irradiated fuel	2019	4.1 11.1
N292.2	Interim dry storage of irradiated fuel	2013	4.1 11.1
N292.3	Management of low- and intermediate-level radioactive waste	2014	4.1 11.1
N294	Decommissioning of facilities containing nuclear substances	2019	G.3 11.2
N393	Fire protection for facilities that process, handle, or store nuclear substances	2013 (R2018)	5.1 10.2 15.1
N393	Fire protection for facilities that process, handle, or store nuclear substances	2022	5.1 10.2
National Fire Protection Association			
NFPA-20	Standard for the Installation of Stationary Pumps for Fire Protection	2010 and Amendment 1 and Amendment 2	5.2
NFPA-24	Standard for the Installation of Private Fire Service Mains and Their Appurtenances	2010	5.2
National Research Council Canada Documents			
N/A	National Building Code of Canada	2010	5.1 10.2
N/A	National Building Code of Canada	2015	5.1 10.2

Doc #	Title	Version	LC
N/A	National Building Code of Canada	2020	5.1 10.2 15.1
N/A	National Fire Code of Canada	2010	5.1 10.2
N/A	National Fire Code of Canada	2015	5.1 10.2
N/A	National Fire Code of Canada	2020	5.1 10.2 15.1

APPENDIX D: LIST OF LICENSEE DOCUMENTS THAT REQUIRE NOTIFICATION OF CHANGE

Doc #	Title	Prior Notice	LC
00044-CORR-00531-01153	Licence Application for the Renewal of the Darlington Waste Management Facility Operating Licence	N	G.1
OPG-PROC-0019	Records and Document Management	N	G.2
OPG-PROG-0001	Information Management	N	G.2
N/A	CNSC Financial Security and ONFA Access Agreement between OPG, the Province of Ontario and the CNSC effective [DATE]	Y Requires CNSC acceptance of change	G.3
OPG-PROG-0009	Items and Services Management	N	1.1
N-STD-AS-0020	Nuclear Management Systems Organizations	N	1.1
N-PROC-AS-0077	Nuclear Safety Culture Assessment	N	1.1
N-STD-AS-0023	Nuclear Safety Oversight	N	1.1
N-POL-0001	Nuclear Safety Policy	N	1.1
N-CHAR-AS-0002	Nuclear Management System	Y	1.1
N-PROG-AS-0001	Nuclear Management System Administration	N	1.1
OPG-PROG-0039	Project Management	N	1.1
OPG-PROG-RA-0010	Independent Assessments	N	1.1
N-PROG-AS-0002	Human Performance	N	2.1

Doc #	Title	Prior Notice	LC
N-PROC-OP-0047	Hours Of Work Limits And Managing Worker Fatigue	Y	2.1
N-PROC-TR-0008	Systematic Approach to Training	N	2.2
N-PROG-TR-0005	Training	N	2.2
W-PROG-WM-0001	Nuclear Waste Management	Y	3.1 6.1 11.1
00044-OPP-01911.1-00001	Operating Policies and Principles, Darlington Waste Management Facility	Y	3.1 3.2
N-PROG-RA-0002	Conduct of Regulatory Affairs	N	3.2
N-PROG-RA-0003	Performance Improvement	N	3.2
N-PROC-RA-0020	Preliminary Event Notification	N	3.2
N-PROG-MP-0014	Reactor Safety Program	N	4.1
00044-SR-01320-10002	Darlington Waste Management Facility Safety Report	Y	4.1
N-STD-MP-0028	Conduct of Engineering	N	5.1 6.1
N-STD-MP-0027	Configuration Management	N	5.1
N-PROG-MP-0009	Design Management	N	5.1 6.1
N-PROG-MP-0001	Engineering Change Control	N	5.1

Doc #	Title	Prior Notice	LC
N-LIST-00531-10003	Index to OPG Pressure Boundary Program Elements	N	5.2
N-MAN-01913.11-10000	Pressure Boundary Program Manual	N	5.2
N-CORR-00531-20012	Authorized Inspection Agency Service Agreement[1]	Y	5.2
N-PROC-MP-0082	Design Registration	Y	5.2
N-PROG-MP-0004	Pressure Boundary	Y	5.2
N-PROC-MP-0040	System and Item Classification	Y	5.2
N-PROG-MA-0026	Equipment Reliability	N	6.1
N-PROG-MP-0008	Integrated Aging Management	N	6.1
00044-PLAN-20670-00001	Welding Bay Walls Inspection Plan	Y	6.1
00104-PLAN-79171-00001	Used Fuel Dry Storage Container Aging Management Plan	Y	6.1
00104-PLAN-79171-00002	Ontario Power Generation Dry Storage Container – Base (Underside) Inspection Plan	Y	6.1
N-REP-03420-10011	Occupational Radiation Protection Action Levels for Nuclear Waste Management Facilities	Y	7.1
N-PROG-RA-0013	Radiation Protection	Y	7.1 14.1
N-PROC-RA-0019	Dose Limits and Exposure Control	Y	7.1
N-PROC-RA-0027	Radioactive Work Planning, Execution and Close Out	N	7.1

Doc #	Title	Prior Notice	LC
N-MAN-03416-10000	Radiation Dosimetry Program – General Requirements	N	7.1
N-MAN-03416.1-10000	Radiation Dosimetry Program – External Dosimetry	N	7.1
N-MAN-03416.2-10000	Radiation Dosimetry Program – Internal Dosimetry	N	7.1
OPG-POL-0001	Employee Health and Safety Policy	N	8.1
OPG-PROG-0005	Environmental Management System	N	9.1
OPG-POL-0021	Environmental Policy	N	9.1
N-PROC-OP-0025	Management of Environmental Monitoring Program	Y	9.1
N-STD-OP-0031	Monitoring of Nuclear and Hazardous Substances in Effluent	Y	9.1
NK38-REP-07701-00001	Darlington Nuclear Environmental Risk Assessment	Y	9.1
NK38-REP-03482-10001	Derived Release Limits and Environmental Action Levels for Darlington Nuclear Generating Station	Y	9.1
N-STD-RA-0036	Radioactive Materials Transportation Emergency Response Plan	N	10.1
N-PROG-RA-0001	Consolidated Nuclear Emergency Plan	Y	10.1
N-PROG-RA-0012	Fire Protection	Y	10.2
N-PROC-RA-0017	Segregation and Handling of Radioactive Waste	N	11.1
OPG-STD-0156	Management of Waste and Other Environmentally Regulated Materials	N	11.1

Doc #	Title	Prior Notice	LC
W-PROG-WM-0003	Decommissioning Program	Y	11.2
00044-PLAN-00960-00001	Preliminary Decommissioning Plan Darlington Waste Management Facility	Y	11.2
00044-REP-08160-00001	Darlington Waste Management Facility Security Report	N	12.1
NK38-REP-08160.3-00001	Threat and Risk Assessment	N	12.1
N-PROG-RA-0011	Nuclear Security	Y	12.1
N-PROC-RA-0135	Cyber Security	N	12.1
N-PROG-RA-0015	Nuclear Safeguards	Y	13.1
N-STD-RA-0024	Nuclear Safeguards Implementation	Y	13.1
N-PROC-RA-0136	OPG Safeguards and Nuclear Material Accountancy Requirements	N	13.1
W-PROG-WM-0002	Radioactive Material Transportation	N	14.1
N-STD-RA-0036	Radioactive Materials Transportation Emergency Response Plan	N	14.1

APPENDIX E: LIST OF GUIDANCE PUBLICATIONS

Doc #	Title	Version	LC
Canadian Nuclear Safety Commission Documents			
REGDOC-2.1.1	Management Systems	2019	1.1
REGDOC-2.2.1	Human Factors	2019	2.1
REGDOC-2.2.5	Minimum Staff Complement	2019	2.1
REGDOC 2.5.1	General Design Considerations: Human Factors	2019	2.1 5.1
REGDOC- 2.4.4	Safety Analysis for Class 1B Nuclear Facilities	TBD	4.1
REGDOC-2.6.2	Maintenance Programs for Nuclear Power Plants	2017	6.1
REGDOC-2.7.1	Radiation Protection	2021	7.1 9.1
REGDOC 2.7.2	Dosimetry Vol I: Ascertaining Occupational Dose	2021	7.1
REGDOC 2.8.1	Conventional Health and Safety	2019	8.1
REGDOC-2.9.1	Environmental Protection: Environmental Principles, Assessments and Protection Measures, Version 1.2	2017	9.1
REGDOC-2.11	Framework for Radioactive Waste Management and Decommissioning in Canada	2018	11.1
REGDOC 2.11.2	Decommissioning	2021	11.2
REGDOC-2.12.3	Security of Nuclear Substances: Sealed Sources and Category I, II, and III Nuclear Material, Version 2.1	2020	12.1
REGDOC-2.14.1	Volume 1, Information Incorporated by Reference in Canada's Packaging and Transport of Nuclear Substances Regulations, 2015, Version 2	2021	14.1

Doc #	Title	Version	LC
Canadian Standards Association Group Documents			
N286.0.1	Commentary on N286-12, Management system requirements for nuclear facilities		1.1
N290.12	Human factors in design for nuclear power plants	2014	5.1
N291	Requirements for safety-related structures for nuclear power plants	2015	5.1 6.1
N288.1	Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities	2020	9.1
N288.2	Guidelines for Calculating the Radiological Consequences to the Public of a Release of Airborne Radioactive Material for Nuclear Reactor Accidents	2014	9.1
N292.8	Characterization of radioactive waste and irradiated fuel	2021	11.1
N290.7	Cyber Security for Nuclear Facilities	2014	12.1
International Atomic Energy Agency Documents			
SSG-15	Storage of Spent Nuclear Fuel	2012	6.1
Nuclear Security Series No. 4 Technical Guidance	Engineering Safety Aspects of the Protection of Nuclear Power Plants Against Sabotage	2007	12.1
Nuclear Security Series No. 13 Recommendations	Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities	Revision 5	12.1
Nuclear Security Series No. 17 Technical Guidance	Computer Security Techniques for Nuclear Facilities	2011	12.1
Nuclear Security Series No. 33 T Technical Guidance	Computer Security of Instrumentation and Control Systems at Nuclear Facilities		12.1

Doc #	Title	Version	LC
Ontario Power Generation			
N-REF-01913.11-10001	Temporary Leak Maintenance by Leak Mitigation Process	2019	5.2