



**Written submission from  
Ontario Power Generation**

**Mémoire d'  
Ontario Power Generation**

In the Matter of

À l'égard de

**Ontario Power Generation  
Darlington Nuclear Generating Station**

**Ontario Power Generation  
Centrale nucléaire de Darlington**

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**Request to revise the Darlington Nuclear  
Generating Station Integrated  
Implementation Plan**

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**Demande visant à réviser le plan intégré de  
mise en œuvre de la centrale nucléaire de  
Darlington**

Hearing in writing based on written  
submissions

Audience par écrit fondée sur des mémoires

**March 2023**

**Mars 2023**

June 28, 2022

**OPG Proprietary**

NK38-CORR-00531-23402 P

Mr. D. Saumure  
Commission Registrar  
Canadian Nuclear Safety Commission  
P.O. Box 1046  
280 Slater Street  
OTTAWA, Ontario  
K1P 5S9

Dear Mr. Saumure:

**Darlington NGS Refurbishment: Request for Commission Approval to Revise the Integrated Implementation Plan (IIP)**

The purpose of this letter is to request Commission's approval to process a new revision of the previously approved NK38-REP-03680-10185 R003, "*Darlington NGS Integrated Implementation Plan (IIP)*", in accordance with Darlington's PROL 13.03/2025 and associated Licence Conditions Handbook LCH-PR-13.02/2025-R004, Licence Condition 15.3.

There are three (3) IIP items that require changes due to a new approach to the resolution of what was originally defined in the IIP (Reference 1). OPG has proposed an alternative solution for each IIP item to achieve the same end results. OPG and CNSC staff have discussed the proposed IIP scope changes and OPG has demonstrated to CNSC staff that these changes either fully satisfy or meet the intent of the original IIP commitment.

Attachment 1 of this submission provides a summary of these IIP scope change tasks, their due dates, original IIP activity description, the proposed activity description and the technical basis document reference to support the change. An overview of each of the proposed changes is also provided in Attachment 2.

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A timely response to OPG request to process a new revision to the NK38-REP-03680-10185 R003, "*Darlington NGS Integrated Implementation Plan (IIP)*", in accordance with Darlington's PROL 13.03/2025 and associated Licence Conditions Handbook LCH-PR-13.02/2025-R004, Licence Condition 15.3, would be appreciated.

If you have any questions regarding this submission, please contact Mr. Craig Axler, Manager, Darlington Regulatory Affairs, at 289.314.7769.

Sincerely,



Richard Geofroy  
Senior Vice President  
Darlington Nuclear  
Ontario Power Generation Inc.

Sincerely,



Subo Sinnathamby  
Senior Vice President  
Nuclear Refurbishment  
Ontario Power Generation Inc.

Attach.

cc. Darlington Site Supervisor  
Mr. J. Burta, Director, Darlington Regulatory Program Division CNSC  
Dr. A. Viktorov, Director General, Power Reactor Regulation CNSC  
[forms-formulaires@cnsccsn.gc.ca](mailto:forms-formulaires@cnsccsn.gc.ca)

References:

1. CNSC Letter, J. Burta to S. Gregoris and S. Sinnathamby, "Darlington NGS - Request for CNSC Acceptance of Integrated Implementation Plan (IIP) Revision 003", December 10, 2021, NK38-CORR-00531-23043, e-Doc 6698445.

**Summary of Regulatory Commitments, Regulatory Obligations and Regulatory Management Actions Made/Concurrence Requested**

**NK38-CORR-00531-23402**

**Submission Title:** Darlington NGS Refurbishment: Request for Commission Approval to Revise the Integrated Implementation Plan (IIP)

**Regulatory Commitments (REGC):**

No.	Description	Date to be Completed
	None	

**Regulatory Management Action (REGM):**

No.	Description	Date to be Completed
	None	

**Regulatory Obligation Action (REGO):**

No.	Description	Date to be Completed
	None	

**Concurrence Requested:** OPG requests Commission's approval to process a new revision to the NK38-REP-03680-10185 R003, "Darlington NGS Integrated Implementation Plan (IIP)", in accordance with Darlington's PROL 13.03/2025 and associated Licence Conditions Handbook LCH-PR-13.02/2025-R004, Licence Condition 15.3.

## **ATTACHMENT 1**

OPG letter, R. Geofroy and S. Sinnathamby to D. Saumure, "Darlington NGS Refurbishment: Request for Commission Approval to Revise the Integrated Implementation Plan (IIP)", NK38-CORR-00531-23402

### **Summary of Proposed Scope Changes for Integrated Implementation Plan (IIP) Tasks**

**Prepared by:** Anca McGee

**Reviewed by:** Pankaj Panchal, Florin Musat

**Table 1: IIP Scope Change Summary**

#	IIP Item Number	IIP Due Date	IIP R003 Original Activity Description	IIP R004 Proposed Activity Description	Change Type / Technical Basis Documents
1	IIP-CC 073 Task 3	End of 2025	<p>U0: Perform a visual inspection and megger testing on cables and connections and send power cable sample for analysis.</p> <p>Change the power cables as required based on results of inspection.</p> <p>Replace all catenary power cables.</p>	<p>U0: Perform a visual inspection and megger testing on cables and connections and send power cable sample for analysis.</p> <p>Change the power cables as required based on results of inspection.</p> <p><b><i>Replace catenary power cables as required based on inspection and sample analysis.</i></b></p>	<p><u>Alternate Strategy for Completion</u></p> <p>Refer to Attachment 2.</p>
2	IIP-CC 074 Task 3	End of 2025	<p>U0: Perform a visual inspection and megger testing on the signal cables and connections and send sample for analysis.</p> <p>Change the signal cables as required based on results of inspection.</p> <p>Replace all catenary signal cables.</p>	<p>U0: Perform a visual inspection and megger testing on the signal cables and connections and send sample for analysis.</p> <p>Change the signal cables as required based on results of inspection.</p> <p><b><i>Replace catenary signal cables as required based on inspection and sample analysis.</i></b></p>	<p><u>Alternate Strategy for Completion</u></p> <p>Refer to Attachment 2.</p>
3	IIP-OI 060 Task 1 to 5	End of 2023	<p>U0/U1/U2/U3/U4: Modify the fire protection water booster pump electrical installation to eliminate ground fault interruption and ensure the electrical connections at the fire pump motor terminal boxes are a listed means of connection.</p>	<p>U0/U1/U2/U3/U4: <del>Modify the fire protection water booster pump electrical installation to eliminate ground fault interruption and</del> Ensure the electrical connections at the fire pump motor terminal boxes are a listed means of connection.</p>	<p><u>Alternate Strategy for Completion</u></p> <p>Refer to Attachment 2.</p>

## **ATTACHMENT 2**

OPG letter, R. Geofroy and S. Sinnathamby to D. Saumure, "Darlington NGS Refurbishment: Request for Commission Approval to Revise the Integrated Implementation Plan (IIP)", NK38-CORR-00531-23402

### **Overview of Proposed Scope Changes for IIP Line Items**

**Prepared by:** Anca McGee

**Reviewed by:** Rob Craig, Peter Yim, Pankaj Panchal, Florin Musat



## **Introduction**

This Attachment provides an overview of the three (3) IIP line items that require a change in scope compared to what was originally defined in the IIP (Reference 1).

The proposed changes detailed in this Attachment do not impact on the safety of any Darlington Units, as the proposed alternative scope of work either fully satisfies or meets the intent of the original IIP commitment.

The change in scope allows OPG flexibility in completing all IIP items on schedule. However, before the IIP tasks can be implemented, Commission approval is required in a timely manner.

This Attachment identifies the proposed changes to the IIP tasks along with a high level summary of the details of the changes. The status of discussions with CNSC staff is included where applicable. No alternative will be implemented until agreement is reached on the proposed change with the Commission.

## IIP Scope Changes

The following IIP items represent IIP scope changes and require Commission approval.

- 1) Proposed Change to IIP-CC 073 (Task 3) – U0: Replace all Fuel Handling (FH) Trolley catenary power cables - **Alternate Strategy for Completion**

The committed solution per the IIP was to perform a visual inspection and megger testing on cables and connections and send power cable sample for analysis, change the power cables as required based on results of inspection, and replace all catenary power cables.

As detailed in Reference 2, wholesale replacement of catenary power cables was not appropriate in addressing component aging. Given positive condition analysis results of bounding cable samples, and the absence of OPEX related to operational issues, OPG sought agreement that replacement and analysis of an additional sample subset of cables would satisfy the intent of the IIP task. OPG has proposed that 2 (two) trolley catenary power cables selected from bounding service conditions, will be replaced and submitted for laboratory evaluation. Evaluation techniques will include visual inspection, high voltage withstand, spectroscopy (Near-Infrared and Fournier Transform Infrared), oxidation induction time, indenter modulus, and tensile elongation at break. Data from these evaluations will facilitate a condition assessment representative of the population.

OPG further expressed intent to revise documentation to facilitate improvements to condition monitoring of FH cables. This includes adding more specific criteria for inspecting/monitoring the subject cables to the procedure for FH equipment walk downs. Additionally, it was identified that the document outlining DNGS site cable condition monitoring strategy required revision to fully align with the proposed strategy. These commitments were formalized at CNSC staff's request, and Technical Procedure Change Requests and Document Change Requests were processed accordingly.

OPG's request of Reference 2 to replace catenary power cables as required based on inspection and sample analysis versus a wholesale replacement was accepted by CNSC staff in Reference 3.

- 2) Proposed Change to IIP-CC 074 (Task 3) – U0: Replace all FH Trolley catenary signal cables - **Alternate Strategy for Completion**

The committed solution per the IIP was to perform a visual inspection and megger testing on the signal cables and connections and send sample for analysis, change the signal cables as required based on results of inspection, and replace all catenary signal cables.

As detailed in Reference 2, wholesale replacement of catenary signal cables was not appropriate in addressing component aging. Given positive condition analysis results of bounding cable samples, and the absence of OPEX related to operational issues, OPG sought agreement that replacement and analysis of an additional sample subset of cables would satisfy the intent of the IIP task. OPG has proposed that 7 (seven) trolley catenary signal cables selected from bounding service conditions, will be replaced and submitted for laboratory evaluation. Evaluation techniques will include visual inspection, high voltage withstand,

spectroscopy (Near-Infrared and Fournier Transform Infrared), oxidation induction time, indenter modulus, and tensile elongation at break. Data from these evaluations will facilitate a condition assessment representative of the population.

OPG further expressed intent to revise documentation to facilitate improvements to condition monitoring of FH cables. This includes adding more specific criteria for inspecting/monitoring the subject cables to the procedure for FH equipment walk downs. Additionally, it was identified that the document outlining DNGS site cable condition monitoring strategy required revision to fully align with the proposed strategy. These commitments were formalized at CNSC staff's request, and Technical Procedure Change Requests and Document Change Requests were processed accordingly.

OPG's request of Reference 2 to replace catenary signal cables as required based on inspection and sample analysis versus a wholesale replacement was accepted by CNSC staff in Reference 3.

- 3) Proposed Change to IIP-OI 060 (Task 1 to 5) – U0/U1/U2/U3/U4: Modify the fire protection water booster pump electrical installation (elimination of Ground Fault Interruption (GFI) and ensure the electrical connections at the fire pump motor terminal boxes are a listed means of connection – **Alternate Strategy for Completion**

Clause 9.1.8.1 of NFPA 20 (Standard for the Installation of Stationary Pumps for Fire Protection) requires that no ground fault protection interruption means shall be installed in any fire pump control or power circuit. The motor control centers that supply power to the five firewater booster pumps are equipped with a ground fault protection relay. The alternative solution is to retain the existing ground fault protection for electrical safety reasons, and to update the affected pre-fire plans to ensure that two or more independent standpipes are connected in the event of a pump motor electrical trip. The independent third party review conducted concluded that retaining the ground fault protection relay will not adversely impact fire safety.

OPG's request for CNSC staff consent with this alternative approach was submitted in Reference 4 and accepted by CNSC staff in Reference 5.

The commitment to ensure the electrical connections at the fire pump motor terminal boxes are a listed means of connection remains unchanged.

## **References**

1. CNSC Letter, J. Burta to S. Gregoris and S. Sinnathamby, "Darlington NGS - Request for CNSC Acceptance of Integrated Implementation Plan (IIP) Revision 003", December 10, 2021, NK38-CORR-00531-23043, e-Doc 6698445.
2. OPG Letter, R. Geofroy and S. Sinnathamby to J. Burta, "Darlington NGS Refurbishment: Revised Strategy to Address IIP-CC 073 and CC 074 Task 3", May 01, 2022, NK38-CORR-00531-23255, e-Doc 6769282.
3. CNSC Letter, J. Burta to R. Geofroy, "CNSC Staff Review of Darlington NGS Refurbishment – Revised Strategy to Address IIP-CC 073 Task 3 and IIP-CC 074 Task 3", June 23, 2022, NK38-CORR-00531-23551, e-Doc 6800464.
4. OPG Letter, R. Geofroy and S. Sinnathamby to J. Burta, "Darlington NGS Refurbishment – Request for CNSC Consent for an Alternate Compliance with NFPA 20 Clause 9.1.8.1 for Integrated Implementation Plan (IIP) Item IIP-OI 060", March 28, 2022, NK38-CORR-00531-23257, e-Doc 6765270.
5. CNSC Letter, J. Burta to R. Geofroy, "CNSC Staff Review of Darlington NGS Refurbishment – Request for CNSC Consent for an Alternate Compliance with NFPA 20 Clause 9.1.8.1 for Integrated Implementation Plan (IIP) Item IIP-OI 060", May 27, 2022, NK38-CORR-00531-23401, e-Doc 6791995.