

Synopsis of the Darlington Nuclear Integrated Safety Review Report

Ontario Power Generation (OPG) has completed the final Integrated Safety Review (ISR) report for the Darlington Nuclear station. The report concluded that the existing Darlington station demonstrates a high level of compliance with modern codes and standards. The following is a synopsis of the ISR and its findings.

The objective of the ISR was to determine, by means of a comprehensive assessment of Darlington Station design, condition and operation, the following:

- Extent to which the plant conforms to modern high-level safety goals and requirements;
- Extent to which the licensing basis remains valid;
- Adequacy and effectiveness of the arrangements that are in place to maintain plant safety for long-term operation; and
- Safety improvements to address gaps with respect to modern safety requirements identified during the assessment.

OPG established the objectives and requirements for the ISR in procedure N-PROC-LE- 0005 "Nuclear Refurbishment Integrated Safety Review - Darlington," which was written with consideration for the requirements of the Canadian Nuclear Safety Commission (CNSC) as documented in CNSC Regulatory Document, RD-360 "Life Extension of Nuclear Power Plants." RD-360 identifies that licensees are required to perform an ISR in accordance with International Atomic Energy Agency (IAEA) Safety Standards Series, Safety Guide No. NS-G-2.10 "Periodic Safety Reviews of Nuclear Power Plants." N-PROC-LE-0005 has been previously submitted to and accepted by the CNSC as the methodology for performing the ISR.

The final Darlington ISR report, completed over a three-year period and containing more than 10,000 pages, is a comprehensive assessment of plant design, condition and operation. To facilitate the review and to ensure that all of the CNSC Safety Areas identified in RD-360 were addressed, the ISR involved the following major activities:

- Review of seventeen safety factors;
- Review of 103 modern codes and standards, including issue resolution where required
- Preparation of 130,000 pages of reference material in support of the review; and
- An independent Aggregate Review of the methodology and conclusions by nuclear industry experts.

Safety Factor reports were produced to document the methodology, assumptions, and findings of each review. In some cases, several Safety Factors were grouped together and reported in one safety factor report. Below is a listing of the Safety Factor Reports:

- Plant Design
- Aging and Actual Condition
- Equipment Qualification
- Safety Analysis
- Safety Performance
- Use of Experience from other Plants and Research Findings
- Emergency Planning
- Management
- Environment

- Safeguards
- Security

Any gaps identified from the Safety Factor Reports were consolidated and prioritized based on their overall safety significance.

The majority of the identified issues were quickly addressed by updates in governance, completion of ongoing projects, or providing additional supporting information to the CNSC to demonstrate OPG's compliance with national and international programs.

The remaining issues are known to OPG and already being addressed through existing work programs.

Third-Party Verifications

An ISR Aggregate Assessment was performed prior to the completion of the final ISR Report. The Aggregate Assessment was conducted by a team of independent, nuclear industry experts. The team provided an independent assessment of plant safety for long-term operation, safety improvements and plant strengths identified as part of the ISR to determine the acceptability of associated risks for Darlington station refurbishment study. The external team performed an assessment on the prioritizations, dispositions, and proposed corrective actions of individual gaps.

Overall, the Aggregate Assessment supports OPG's conclusions: the Darlington station's performance is strong and the plant is operating safely and the ISR activities fully meet the requirements of RD-360 and N-PROC-LE-0005. The Aggregate Assessment concluded that the aggregate risk for the present operation of DNGS is acceptably low. Completing the actions recommended in the ISR will continue to enhance the current strong performance.

Summary

OPG has performed an ISR and prepared a Final ISR report for submission to the CNSC. The Darlington station ISR demonstrates a high level of compliance with modern codes and standards.

The Safety Factor reviews did not identify any issues that would limit safe long-term operation. There were no gaps identified that would affect current safe operation. Implementation of actions recommended in the ISR will continue to enhance the station's current strong performance.

The majority of the identified discrepancies have "low" or "very low" safety significance level and were primarily process-related. OPG has practical strategies and work programs in place to address the remaining identified issues.

Any proposed discrepancy resolutions represent safety enhancements, not requirements, and will be undertaken for the refurbishment scope.

* In addition to the ISR Report, OPG continues to work collaboratively with our industry peers, and review lessons learned from the events at the Fukushima Nuclear Station earlier this year. We are confident the events of Japan could not happen here, but we are taking the opportunity to learn what we can from the events. We will work with OPG's Fukushima Response Team to ensure we incorporate what our industry learns from these events into the plans for Refurbishment.