



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

## Record of Proceedings, Including Reasons for Decision

In the Matter of

**Applicant**      Ontario Power Generation Inc.

**Subject**      Application to Amend Darlington Nuclear  
Generating Station Power Reactor Operating  
Licence

**Hearing Date**      December 22, 2014

## **RECORD OF PROCEEDINGS**

Applicant: Ontario Power Generation Inc.

Address/Location: P.O. Box 4000, Bowmanville, Ontario, L1C 3Z8

Purpose: Application to amend Darlington Nuclear Generating Station (NGS) Power Reactor Operating Licence (PROL)

Application received: October 31, 2014

Members present: M. Binder, Chair

**Licence:** Amended

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## 1.0 INTRODUCTION

1. Ontario Power Generation Inc. (OPG) has submitted a request to the Canadian Nuclear Safety Commission<sup>1</sup>, under subsection 24(2) of the *Nuclear Safety and Control Act*<sup>2</sup> (NSCA), for an amendment to licence condition 5.1 of the Darlington Power Reactor Operating Licence (PROL) for its Darlington Nuclear Generating Station (NGS) located in the municipality of Clarington, on the north shore of Lake Ontario. The current licence, PROL 13.00/2015, expires on December 31, 2015.
2. OPG requested that the superseded CNSC Regulatory Document RD-310, *Safety Analysis for Nuclear Power Plants* and CNSC Regulatory Standard S-294, *Probabilistic Safety Analysis (PSA) for Nuclear Power Plants*, be replaced with the newly issued CNSC REGDOC-2.4.1, *Deterministic Safety Analysis*, and CNSC REGDOC-2.4.2, *Probabilistic Safety Analysis (PSA) for Nuclear Power Plants*. The requested changes would allow OPG to better plan safety analysis work, to ensure alignment with the modern regulatory requirements contained in the newly issued REGDOCs, and to ensure that there is consistency between the CNSC regulatory documents listed in their PROL.

### Issue

3. In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the NSCA:
  - a) if OPG is qualified to carry on the activity that the amended licence would authorize; and
  - b) if, in carrying on that activity, OPG would make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

### Hearing

4. Pursuant to section 22 of the NSCA, the President of the Commission established a Panel of the Commission to review the application. The Commission, in making its decision, considered information presented for a hearing based on written materials held on December 22, 2014 in Ottawa, Ontario. During the hearing, the Commission considered written submissions from OPG (CMD 14-H120.1) and CNSC staff (CMD 14-H120).

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

<sup>2</sup> Statutes of Canada (S.C.) 1997, chapter (c.) 9.

## 2.0 DECISION

5. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Proceedings*, the Commission concludes that OPG has met the conditions of subsection 24(4) of the NSCA. Therefore,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, amends the Darlington Power Reactor Operating Licence PROL 13.00/2015 issued to Ontario Power Generation Inc. for its Darlington NGS located in the municipality of Clarington, Ontario. The amended licence, PROL 13.01/2015, is valid until December 31, 2015, unless suspended, amended, revoked or replaced.

6. The Commission includes in the licence the conditions as recommended by CNSC staff in CMD 14-H120.

## 3.0 ISSUES AND COMMISSION FINDINGS

7. CNSC staff noted that, as with all nuclear power plants in Canada, OPG has been required to maintain a very comprehensive, systematic and conservative safety analysis for the Darlington NGS.
8. CNSC staff reported that REGDOC-2.4.1 and REGDOC-2.4.2 were issued in May 2014. CNSC staff added that the requirements and guidance in these documents are consistent with modern national and international practice, addressing issues and elements that control and enhance nuclear safety. In particular, they establish a more modern, risk-informed approach to the categorization of accidents, one that considers a full spectrum of possible events, including events of greatest consequence to the public.
9. CNSC staff reported that additional requirements related to multiple reactor units on a site, irradiated fuel bays, and cliff-edge effects are also included in REGDOC-2.4.1 and REGDOC-2.4.2 to reflect the lessons learned from the Fukushima nuclear accident.
10. If the amendment is approved, CNSC staff intends to revise the Darlington licence conditions handbook (LCH) to incorporate implementation plans for REGDOC-2.4.1 and REGDOC-2.4.2. The LCH will also be reviewed to ensure that the compliance verification criteria and guidance provided reflect the updated requirements and guidance associated to the new REGDOCs.

*Replacement of RD-310, Safety Analysis for Nuclear Power Plants with REGDOC-2.4.1, Deterministic Safety Analysis*

11. CNSC staff reported that, while the current deterministic safety analysis for the Darlington NGS has proven to be more than adequate in demonstrating the safety of the plant, OPG recently undertook a safety analysis improvement initiative to adopt modern safety analysis requirements by implementing RD-310. CNSC staff informed the Commission that OPG had been in the process of implementing RD-310 since 2009. The process involved a systematic review and gap assessment of the current safety analyses against the requirements of RD-310, which reflect modern international practices. The scope of the review in each of the accident categories was gauged to maximize safety benefits in support of continued operation and future plant refurbishment at Darlington. This undertaking was planned to be carried out between 2014 and 2021, which CNSC staff found acceptable because the current safety analysis provides an already very comprehensive, systematic and conservative safety assessment of the Darlington NGS.
12. CNSC staff further noted that REGDOC-2.4.1 now allows for a graded approach<sup>3</sup> to be applied to updating the existing Safety Report. CNSC staff indicated that OPG plans to update portions of the Safety Report which have been identified as providing the most value in terms of demonstrable safety benefit either through improved safety margins or addressing known shortcomings or gaps in the existing analyses. This will allow OPG to focus efforts and direct resources to more safety significant activities.
13. CNSC staff explained that, as technical requirements of both RD-310 and REGDOC-2.4.1 are relatively similar, that the gaps OPG identified in its RD-310 gap assessment will be used in their application of the graded approach. The schedule for completing this work is anticipated to last until 2020. CNSC staff considers this acceptable since the current safety analysis provides an already very comprehensive, systematic and conservative and conservative safety assessment of the Darlington NGS.
14. CNSC staff reported that it is currently reviewing the implementation plan OPG submitted which reflects the timelines mentioned above.

*Replacement of S-294, Probabilistic Safety Assessment (PSA) for Nuclear Power Plants with REGDOC-2.4.2, Safety Analysis: Probabilistic Safety Assessment (PSA) for Nuclear Power Plants*

15. CNSC staff informed the Commission that OPG had submitted in 2011 a comprehensive probabilistic safety analysis (PSA) for the Darlington NGS, which was compliant with requirements stated in S-294. This was the first such submission in Canada.

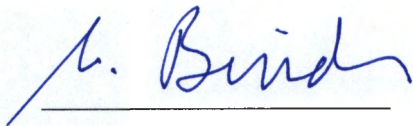
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<sup>3</sup> This approach means that a method or process by which elements such as the level of analysis, the depth of documentation and the scope of actions necessary to comply with requirements are commensurate with the relative risks to health, safety, security, the environment, and the implementation of international obligations to which Canada has agreed and the particular characteristics of a facility.

16. CNSC staff noted that, in addition to specifying requirement related to conducting a PSA, S-294 also requires the licensee to update their PSA every three years or sooner if major changes occur in the facility. This would oblige OPG to update and submit a revised PSA by December 31, 2014. In contrast to S-294, REGDOC-2.4.2 establishes a PSA update cycle frequency of five years, therefore extending the deadline to December 2016. CNSC staff supports this deadline extension.
17. Consistent with REGDOC-2.4.1, REGDOC-2.4.2 also permits for a graded approach to be applied to PSAs. CNSC staff reported that, in the first phase of its PSA review, OPG initiated the process of revising the Darlington PSA using this approach and is planning on submitting an updated PSA containing updates on areas considered having highest priority by June 19, 2015, ahead of Part 1 of the upcoming Darlington relicensing hearing and a year in advance of the deadline that would be imposed by REGDOC-2.4.2 for submitting a revised PSA. CNSC staff further noted that, by August 12, 2015, well ahead of Part 2 of the relicensing hearing planned for November 4-5, OPG intends on posting a public PSA summary report, which would allow intervenors ample time to review and comment on the results. In Phase 2 of the implementation strategy, OPG plans on providing the subsequent updated PSA to achieve full compliance with REGDOC-2.4.2 within 5 years of 2015. CNSC staff has reviewed this proposal and finds it acceptable.

#### 4.0 CONCLUSION

18. The Commission has considered the information and submissions from OPG and CNSC staff and is satisfied that the requested amendments will not adversely impact the safety of the Darlington NGS operations. The Commission is of the view that the current safety analysis is already more than adequate in demonstrating the safety of the plant, and that the proposed inclusion of REGDOC-2.4.1 and REGDOC-2.4.2 in the Darlington NGS operating licence will ensure that more modern safety analysis requirements are adopted, and that events of greatest consequence to the public are analyzed both deterministically and probabilistically.



Michael Binder  
President,  
Canadian Nuclear Safety Commission

DEC 22 2014

Date