

December 13, 2013

NK38-00531 P
NK38-CORR-00531-16490 P

Mr. M. Leblanc
Commission Secretary
Canadian Nuclear Safety Commission
280 Slater Street
P.O. Box 1046, Station B
OTTAWA, Ontario
K1P 5S9

Dear Mr. Leblanc:

**Darlington NGS - Application for Renewal of the Darlington Nuclear
Generating Station Power Reactor Operating Licence 13.00/2014**

The purpose of this letter is to submit to the Canadian Nuclear Safety Commission (CNSC) Ontario Power Generation Inc.'s (OPG) application for renewal of the Darlington Nuclear Generating Station (NGS) Power Reactor Operating Licence (PROL). The current PROL (13.00/2014) expires on December 31, 2014. OPG is a corporation incorporated under the Business Corporations Act (Ontario) with its head office located at 700 University Avenue, Toronto, Ontario, M5G 1X6.

OPG is requesting a renewed term for the Darlington NGS operating licence that covers the life extension activities, including refurbishment, on the four Darlington NGS units.

During this requested licence period, OPG remains committed to safe plant operation in a manner that poses minimal risk to the public, to OPG employees and to the environment.

Darlington Performance

The Darlington NGS facility consists of four nuclear reactors that were designed, constructed, and operated to produce electrical power. Darlington NGS also includes the Tritium Removal Facility (TRF). The TRF is designed, constructed, and operated to reduce the tritium levels in heavy water inventories.

The management and operation of the Darlington NGS facility and the nuclear substances, prescribed equipment, and prescribed information associated therewith is

the overall responsibility of Mr. Brian Duncan, Senior Vice-President, Darlington Nuclear.

The Darlington NGS has been recognized by its peers as one of the top performing nuclear plants in the world. High performance of the Darlington NGS is the result of a robust design, solid engineering, operations and maintenance programs and processes that incorporate continuous improvement, and an organization that is committed to safety as a core value and overriding priority. OPG also has strong local community support for the ongoing operation of Darlington NGS.

Refurbishment

During the requested licence term, OPG plans to complete the refurbishment of the four Darlington NGS units. In support of the life extension of the Darlington units, the following assessments were submitted to CNSC staff in accordance with regulatory document RD-360 *“Life Extension of Nuclear Power Plants”*:

- Environmental Assessment: The Commission concluded that the refurbishment and continued operation of Darlington NGS to approximately 2055, taking into account the appropriate mitigation measures identified in the Screening Report, will not likely cause significant adverse environmental effects.
- Integrated Safety Review: This review concluded that Darlington NGS conforms closely to modern standards and international practices and that there were no safety significant gaps identified. This review also confirmed that the licensing basis will remain valid over the extended operating life and that there are adequate measures in place to maintain plant safety for long-term operation to approximately 2055.
- Global Assessment: This assessment concludes that Darlington NGS is a safe and reliable generating station with opportunities for further improvements that will result in an even safer and more reliable supplier of clean electrical power to the Province of Ontario.

The safety improvements identified in these three assessments are contained in an Integrated Implementation Plan which was submitted to the CNSC along with the Global Assessment Report (Reference 1).

These assessments form the technical basis for refurbishment and continued operation of Darlington NGS until approximately 2055. These assessments also form the first step towards transition to a periodic safety review approach for nuclear power plant licensing that is envisioned by the Commission in accordance with the Fukushima Action Plan. OPG will commence periodic safety reviews after completion of the final unit refurbishment.

OPG commits to provide an update to the Commission following refurbishment of each unit to inform the Commission on the key lessons learned, to confirm the activities to be undertaken for the remaining unit(s) and any outstanding Integrated Implementation Plan actions to be completed in post-refurbishment outages.

Term of Licence

OPG is requesting a licence to December 1, 2028 to cover the refurbishment of the four units and completion of the major activities outlined in the Integrated Implementation plan. While this is a longer licence term than what has traditionally been granted to a Canadian licensee, this longer term should be considered based on the following rationale:

- Darlington NGS is one of the top performing nuclear plants in the world.
- OPG has completed several comprehensive assessments, as noted above, which support long term plant operation.
- Safety improvements will be implemented which will result in Darlington NGS being an even safer and more reliable plant. Based on current planning assumptions, these safety improvements will be completed during the life extension window as described in the application.
- OPG will update the safety reviews that were performed following refurbishment of the last unit.
- OPG commits to provide an update after the refurbishment of each unit in addition to the annual appearance before the Commission.
- The host community strongly supports the long term operation of Darlington NGS.
- The length of the term does not impact the effectiveness of the compliance program established by the CNSC staff nor the authority of the Commission to suspend, revoke or replace the licence including establishing new licence conditions.

Application

The applicable Regulations under the Nuclear Safety and Control Act and General Regulations require specific information to be contained in an application for licence renewal. Provided in Attachment 1 is a matrix that identifies the specific location of the required information. In addition, CNSC staff requirements provided to OPG in References 2 and 3 have also been incorporated.

Attachment 2 provides the application and describes, for each Safety Control Area (SCA), the objective of the SCA and the programs in place to ensure compliance with the objective. Also described is Darlington NGS performance since the last licence renewal, planned improvements prior to Refurbishment project, and measures that will be in place during the refurbishment period.

Consistent with OPG's approach towards open and transparent public communications, OPG will be posting the application, the Integrated Implementation Plan and the Global Assessment Report on its external web-site www.opg.com.

CNSC's approval of OPG's application for renewal of the Darlington NGS PROL is hereby requested.

Should you have any questions or requests for further information please contact Mr. Doug Coleman, Manager – Regulatory Affairs, at (905) 623-6670 ext. 1093.

Sincerely,

Original Signed by

Brian Duncan
Senior Vice President
Darlington Nuclear
Ontario Power Generation Inc.

Attach.

cc: Dr. G. Rzentkowski - CNSC (Ottawa)
Mr. F. Rinfret - CNSC (Ottawa)
Mr. A. Ling - CNSC (Darlington)

- References:
1. [OPG letter, D. Reiner and B. Duncan, to F. Rinfret "Request for CNSC Acceptance of the Darlington NGS Global Assessment Report \(GAR\) and Integrated Implementation Plan \(IIP\)", December 2, 2013, CD# NK38-CORR-00531-16568.](#)
 2. [CNSC letter, M.A. Leblanc to R. MacEacheron, "Application Requirements for Renewal of the Darlington Nuclear Generating Station Power Reactor Operating Licence", May 30, 2013, e-Doc# 4135298, CD# NK38-CORR-00531-16342.](#)
 3. [CNSC letter, M.A. Leblanc to R. MacEacheron, "Updated Application Requirements for Renewal of the Darlington Nuclear Generating Station Power Reactor Operating Licence", October 11, 2013, e-Doc# 4203644, CD# NK38-CORR-00531-16543.](#)

ATTACHMENT 1

OPG letter B. Duncan to M. Leblanc, "Darlington NGS – Application for Renewal of the Darlington Nuclear Generating Station Power Reactor Operating Licence 13.00/2014"

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Licence Renewal Application Matrix

Attachment 1

LICENCE RENEWAL APPLICATION MATRIX

Regulatory Requirement	Description of Regulatory Requirement	Location in submission
General Nuclear Safety and Control Regulations (G)		
LICENCES, General Application Requirements		
G3(1)	An application for a licence shall contain the following information;	N/A
G3(1)(a)	The applicant's name and business address;	Letter
G3(1)(b)	The activity to be licensed and its purpose;	Letter
G3(1)(c)	The name, maximum quantity and form of any nuclear substance to be encompassed by the licence;	Attachment 2, Appendix 4
G3(1)(d)	A description of any nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence;	Attachment 2, Sections 5, 6 and 13
G3(1)(e)	The proposed measures to ensure compliance with the <i>Radiation Protection Regulations</i> and the <i>Nuclear Security Regulations</i> ;	Attachment 2, Sections 8 and 13
G3(1)(f)	Any proposed action level for the purpose of section 6 of the <i>Radiation Protection Regulations</i> ;	Attachment 2, Section 8
G3(1)(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;	Attachment 2, Section 13
G3(1)(h)	The proposed measures to prevent loss or illegal use, possession or removal of the nuclear substance, prescribed equipment or prescribed information;	Attachment 2, Section 13
G3(1)(i)	A description and the results of any test, analysis or calculation performed to substantiate the information included in the application;	Attachment 2, Section 5
G3(1)(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;	Attachment 2, Section 12
G3(1)(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;	Attachment 2, Section 2
G3(1)(l)	A description of any proposed financial guarantee relating to the activity to be licensed;	Attachment 2, Sections 12 and 20
G3(1)(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; and	Letter and Attachment 2, Appendix 4
Application for Renewal of Licence		
G5(a)	(a) The information required to be contained in an application for that licence by the applicable regulations made under the Act; and	Letter and Attachment 2
G5(b)	(b) A statement identifying the changes in the information that was previously submitted.	Attachment 2, Section 1.2

Regulatory Requirement	Description of Regulatory Requirement	Location in submission
Representatives of Applicants and Licensees		
G15	Every applicant for a licence and every licensee shall notify the Commission of:	
G15(a)	Names of persons who have authority to act for the licensee in their dealings with the Commission.	Attachment 2, Section 2
G15(b)	Names and position titles of the persons who are responsible for the management and control of the licensed activity.	Letter and Attachment 2, Section 2
Class I Nuclear Facilities Regulations (C) LICENCE APPLICATIONS, <i>General Requirements</i>		
C3	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 section 3 of the General Nuclear Safety and Control Regulations;	N/A
C3(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;	Attachment 2, Appendix 1
C3(b)	Plans showing the location, perimeter, areas, structures and systems of the nuclear facility;	Attachment 2, Appendix 1
C3(c)	Evidence that the applicant is the owner of the site or has authority from the owner of the site to carry out the activity to be licensed;	Attachment 2, Appendix 2
C3(d)	The proposed quality assurance program for the activity to be licensed;	Attachment 2, Section 2
C3(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 2, Appendix 5
C3(f)	The proposed worker health and safety policies and procedures:	Attachment 2, Section 9
C3(g)	The proposed environmental protection policies and procedures;	Attachment 2, Section 10
C3(h)	The proposed effluent and environmental monitoring programs;	Attachment 2, Section 10
C3(i)	If the application is in respect of a nuclear facility referred to in paragraph 2(b) of the <i>Nuclear Security Regulations</i> , the information required by section 3 of those Regulations;	Attachment 2, Section 13
C3(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 2, Section 10
C3(k)	The proposed plan for the decommissioning of the nuclear facility or of the site.	Attachment 2, Section 12

Regulatory Requirement	Description of Regulatory Requirement	Location in submission
<i>Licence to Operate</i>		
C6	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:	N/A
C6(a)	A description of the structures at the nuclear facility, including their design and their design operating conditions;	Attachment 2, Sections 5 and 6
C6(b)	A description of the systems and equipment at the nuclear facility, including their design and their design operating conditions;	Attachment 2, Sections 5 and 6
C6(c)	A final safety analysis report demonstrating the adequacy of the design of the nuclear facility;	Attachment 2, Section 5
C6(d)	The proposed measures, policies, methods and procedures for operating and maintaining the nuclear facility;	Attachment 2, Section 4
C6(e)	The proposed procedures for handling, storing, loading and transporting nuclear substances and hazardous substances;	Attachment 2, Sections 8 and 15
C6(f)	The proposed measures to facilitate Canada's compliance with any applicable safeguards agreement;	Attachment 2, Section 14
C6(g)	The proposed commissioning program for the systems and equipment that will be used at the nuclear facility;	Attachment 2, Section 6
C6(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 2, Section 10
C6(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, the health and safety and hazardous substances into the environment, including their physical, chemical and radiological characteristics;	Attachment 2, Section 10
C6(j)	The proposed measures to control releases of nuclear substances and hazardous substances into the environment;	Attachment 2, Section 10
C6(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 security, including measures to (i) assist off-site authorities in planning and preparing to limit the effects of an accidental release, (ii) notify off-site authorities of an accidental release or the imminence of an accidental release, (iii) report information to off-site authorities during and after an accidental release, (iv) assist off-site 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 2, Section 11
C6(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 2, Section 13

Regulatory Requirement	Description of Regulatory Requirement	Location in submission
C6(m)	The proposed responsibilities of and qualification requirements and training program for workers, including the procedures for the requalification of workers; and	Attachment 2, Section 3
C6(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 2, Section 3
Nuclear Security Regulations (S) LICENCE APPLICATIONS, Licence in Respect of Category I or II Nuclear Material at a Nuclear Facility		
S3	An application for a licence in respect of Category I or II nuclear material, other than a licence to transport, and an application for a licence in respect of a nuclear facility referred to in paragraph 2(b) shall contain the following information in addition to the information required by section 3 of the <u>Nuclear Substances and Radiation Devices Regulations</u> or sections 3 to 8 of the <u>Class I Nuclear Facilities Regulations</u> , as applicable:	N/A
S3.(a)	A copy of the written protection arrangements made with a response force, referred to in section 35;	Attachment 2, Section 13
S3.(b)	The site plan referred to in section 16;	Attachment 2, Section 13
S3.(c)	A description of the proposed security equipment, systems and procedures;	Attachment 2, Section 13
S3.(d)	A description of the proposed on-site and off-site communications equipment, systems and procedures;	Attachment 2, Section 13
S3.(e)	A description of the proposed structure and organization of the nuclear security guard service, including the duties, responsibilities and training of nuclear security guards;	Attachment 2, Section 13
S3.(f)	The proposed plan and procedures to assess and respond to breaches of security; and	Attachment 2, Section 13
S3.(g)	The current threat and risk assessment.	Attachment 2, Section 13

ATTACHMENT 2

OPG letter B. Duncan to M. Leblanc, "Darlington NGS – Application for Renewal of the Darlington Nuclear Generating Station Power Reactor Operating Licence 13.00/2014"

CD# NK38-CORR-00531-16490

Licence Renewal Application