

OVERVIEW OF NUCLEAR FACILITIES

1.0 PURPOSE

This evidence describes OPG's nuclear facilities and sets out an overview of OPG's nuclear mandate, objectives, organization, and governance framework.

The evidence is substantially the same as Ex. A1-4-3 submitted in the last application (EB-2010-0008) with the exception of an update to section 3.0, Nuclear Organization.

2.0 OPG'S NUCLEAR GENERATING FACILITIES

OPG's nuclear generating facilities consist of Pickering Generating Station ("Pickering") and Darlington Generating Station ("Darlington") (collectively, the "nuclear generating stations"). In 2010, the operations of Pickering Units 1 and 4 (formerly referred to as Pickering A) and Pickering Units 5 - 8 (formerly referred to as Pickering B) were amalgamated into a single station. With amalgamation, Pickering has one management team with a common reporting structure. This allowed OPG to reduce station administration and overheads and to reduce staff through attrition.

All of OPG's nuclear generating stations are based on CANDU technology, a pressurized-heavy-water reactor using natural-uranium technology developed in Canada. CANDU reactors are unique in their use of natural uranium, deuterium oxide (heavy water) as a moderator/coolant, on-line refueling capability and two shut down safety systems. These plants serve as base load resources since they have been designed to operate at full power. Photographs of the stations are provided in Attachment 1 and Attachment 2. Chart 1 below provides some basic information about the nuclear generating stations.

Chart 1
Nuclear Generating Stations Basic Information

	Pickering		Darlington
	Units 1 and 4	Units 5-8	Units 1-4
In-service dates	1971 - 1973	1983 - 1986	1989 - 1992
Net in-service capacity	1,030 MW	2,064 MW	3,512 MW
Number of units in-service and size in MW's	2 x 540	4 x 540	4 x 934

While OPG's ten nuclear units are based on CANDU principles they reflect three generations of design philosophy and technology with Pickering Units 1 and 4, Pickering 5 - 8, and Darlington built in the 1960s, 1970s, and 1980s respectively. This results in significant variations among the three nuclear stations, including technology system components and overall design. Discussion of technology and design differences between CANDU units and Pressurized Water Reactors ("PWR") can be found at Ex. F2-1-1.

3.0 NUCLEAR ORGANIZATION

The nuclear business unit is comprised of Nuclear Operations and Nuclear Projects (per OPG's organizational chart shown in Ex. A1-5-1). The Nuclear business unit was subject to reorganization under Business Transformation (Ex. A4-1-1). At the time of the preparation of the 2013-2015 Nuclear Business Plan, the Nuclear business unit was organized as follows:

Nuclear Operations

Nuclear Operations, under the direction and leadership of the Chief Nuclear Office ("CNO"), is focused on the operation, maintenance, and performance of Pickering and Darlington, along with oversight of various core nuclear support services, which include:

- Nuclear Engineering
- Nuclear Services
- Nuclear Security and Emergency Services

- Fleet Operations and Maintenance
- Nuclear Waste Management Division

Nuclear Projects

Nuclear Projects under the direction and leadership of the Senior Vice President, Nuclear Projects is responsible for managing the planning and development of all projects in Nuclear. This includes major refurbishment projects at Darlington, as discussed in greater detail in Ex. D2-2-1, as well as managing OPG's new nuclear project at Darlington ("DNNP"), as discussed in greater detail in Ex. F2-8-1.

In addition, Nuclear Projects includes:

- Inspection and Maintenance Services
- Projects and Modifications, Facilities, and Nuclear Waste Projects
- Decommissioning and Deep Geological Repository ("DGR") Oversight (i.e., oversight of the Canadian Nuclear Waste Management Organization's activities related to OPG's nuclear waste and decommissioning obligations)

A description of the roles and responsibilities of the various operating groups in the Nuclear business unit is provided in Ex. F2-2-1.

Nuclear Projects was restructured to focus solely on project-related work and consequently Inspection and Maintenance Services moved to Nuclear Operations reporting directly to the CNO. The Decommissioning and DGR Oversight were transferred to Nuclear Waste Management Division. Also overall project management and support for DNNP moved to Corporate Business Development, DNNP Licensing reports to Nuclear Services and DNNP Engineering reports to Nuclear Engineering.

4.0 OPG NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING

OPG is responsible for the ongoing long-term management of nuclear waste produced by its operations, including low and intermediate level radioactive waste and used fuel. OPG discharges its responsibility for used fuel by overseeing the Nuclear Waste Management

Organization, who has legal responsibility in this area. OPG will have to manage radioactive waste associated with the decommissioning of its nuclear generating stations (including the Bruce Generating Stations) after the end of their useful lives.

The liabilities of OPG's predecessor, Ontario Hydro, associated with nuclear waste management and decommissioning were transferred to OPG in April 1999. The responsibility for funding these liabilities is described in the Ontario Nuclear Funds Agreement ("ONFA") between the Province of Ontario and OPG.

Details on nuclear waste management and decommissioning including the funding of nuclear liabilities are provided in Exhibit C2.

5.0 NUCLEAR OBJECTIVES

OPG Nuclear has the following cornerstone objectives with the purpose of making the existing nuclear facilities more dependable, predictable, and cost effective:

- **Safety:** The Safety objective makes nuclear safety, employee safety and environmental safety (e.g., radiation) the overriding priority. It requires that all laws and industry/regulatory expectations are met, activities are performed conservatively and responsibly, and that business decisions are made with the full knowledge of the risks and potential impacts.
- **Human Performance:** The Human Performance objective recognizes that minimizing individual fallibility and organizational programs/processes is the basis for operational excellence.
- **Reliability:** The Reliability objective requires that OPG operates, maintains and engineers the nuclear facilities such that equipment, performance, availability and output are optimized.
- **Value for Money:** The Value for Money objective delivers solutions that are the best combination of cost, quality and performance.

- 1 These cornerstone objectives are the basis for the establishment of performance targets and
- 2 key initiatives during the benchmarking and business planning process, as discussed at Ex.
- 3 F2-1-1.

LIST OF ATTACHMENTS

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Attachment 1: Photograph of Darlington Generating Station
Attachment 2: Photograph of Pickering Generating Station

ATTACHMENT 1

Photograph of Darlington Generating Station



ATTACHMENT 2

Photograph of Pickering Generating Station

