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OPG Project Management Principles

Ontario Power Generation has considerable experience managing large projects both in our nuclear and non-nuclear generation operations.

Every CANDU unit is designed to have a mid-life refurbishment to allow for major components to be retooled and refurbished. The scope of the refurbishment work in part depends on plant condition. Darlington Nuclear is a station well-maintained through a regular inspection and maintenance regime. Based on this, and on results of further inspections over the past two years, there is strong evidence the plant condition is robust and will remain so as it enters the refurbishment process. The refurbishment planning and study phase over the next five years will validate the extent of plant condition.

Pickering Unit 4 was the first CANDU unit to be returned to service with a significant overhaul of its systems. That project encountered challenges that led to a significant review of our planning and work execution processes on the management of reactor projects. In fact, the lessons learned on the Pickering Unit 4, and a subsequent report by the Honourable John Manley provided recommendations for future project management practices. These were critical inputs, resulting in development of a rigorous planning and project management process. This set the framework for success on the Pickering Unit 1 return to service in 2005. That project was brought in on budget and on time.

Since then, OPG has continued to develop and improve its model for project management on nuclear projects and within other areas of operations. Key to this process is a strong risk mitigation model based on on-going benchmarking and learning, not only from our own projects but from those of others in the nuclear industry, and in non-nuclear industries as well.

Projects OPG has successfully managed in the last couple of years include a comprehensive Pickering B fuel channel inspection and maintenance project and the \$360-million safe storage of Units 2 and 3 at Pickering A (to be completed in 2010). In 2009, OPG also successfully completed two major projects at Darlington Nuclear: a 3,600-task Tritium Removal Facility maintenance outage and the massive Vacuum Building Outage, which included two years of planning, and completion of over 25,000 tasks within a six-week shutdown period. Other recent OPG project successes have included the construction of the Portlands Energy Centre, a 550 MW combined cycle gas-steam generating station in downtown Toronto. The project, a partnership

between OPG and TransCanada Energy, was delivered ahead of schedule and under budget.

Key Principles of the Darlington Refurbishment Project Management

While no project is risk free, OPG has adopted key principles that will help us mitigate project risks to as low as reasonably achievable on the Darlington Refurbishment project.

- We applied the lessons learned from the Pickering A Unit 4 Return to Service (2003) to ensure the successful Return to Service of Pickering Unit 1 (2005) and will continue to evolve our processes based on experience from each major nuclear project OPG undertakes. In addition we add to this experience from careful examination of CANDU projects at other organizations as well as other non-nuclear OPG projects;
- OPG has had oversight and review provided by third-party experts and has internalized their recommendations. This includes the 2004 report by the Honourable John Manley, detailing a full analysis of the Pickering Unit 4 Return to Service – the first major mid-life project on a CANDU unit;
- OPG ‘plans the work and works the plan.’ For Darlington Refurbishment, we are already planning the work well ahead of the first unit scheduled shutdown. All requirements will be completed to support the start date, just as we did for the successful 2009 Darlington Vacuum Building Outage;
- We are doing an in-depth plant condition assessment ahead of the refurbishment work to ensure there are no surprises;
- We are learning from others in the industry, benchmarking project management in Canada and abroad to improve our processes based on lessons learned from all projects, not just our own;
- OPG will ensure our contracting strategy sets us up for success including a resourcing model to optimize contract staff and supplies in the right place, at the right time for efficient work execution;
- Project schedules will be developed to allow us to complete full evolutions of work on one reactor unit before we move to the same work on the next unit. This allows us to apply lessons learned in real time;

- The Schedule Performance and Cost Performance Indexes will be continuously monitored, as well as Construction productivity rates. We will make changes as necessary to be successful.
- We will set up an independent oversight group – we will trust our results only following verification;
- Sufficient schedule and cost contingency will be calculated into our projections to accommodate project risks.

For More Information, Contact:

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