

## **PROJECT AND PORTFOLIO MANAGEMENT - NUCLEAR**

### **1.0 PURPOSE**

This evidence provides an overview of the nuclear operations project portfolio and other related project work. The project portfolio includes project OM&A, which forms part of the overall OM&A amounts in the revenue requirement, and project capital which is included in rate base when projects are completed and placed into service. This evidence also discusses the process for managing this portfolio and the forecast level of nuclear project expenditures (excluding Darlington Refurbishment) in the test period.

### **2.0 NUCLEAR PORTFOLIO MANAGEMENT PROCESS**

OPG Nuclear employs a portfolio management approach to assess and prioritize all nuclear operations projects (both project OM&A and capital). The portfolio management approach (e.g., project prioritization, project phases and approval processes, and the role of the Asset Investment Screening Committee (AISC)) is discussed in Section 3.0 below and is unchanged from that presented in EB-2010-0008.

OPG Nuclear projects within this portfolio are developed to meet regulatory commitments (e.g., from the Canadian Nuclear Safety Commission), increase system or unit reliability, address system obsolescence or optimize station generation. Since 2010, expenditures on major capital spares have also been considered part of the capital project portfolio, due to their role in supporting system or unit reliability. OPG targets its total nuclear operations project portfolio (i.e. annual capital expenditures and project OM&A) to be in the range of \$250M to \$300M ( or \$25M to \$30M per nuclear unit). This target range was developed in consideration of OPG's historical investment patterns, project execution capabilities, and high-level comparative benchmark data from other nuclear utilities (OPG's historical project investment benchmarks below medium).

OPG's actual project OM&A and capital expenditures in 2011 and 2012 were slightly below the low end of its target range. This outcome reflects the deferral of certain major project expenditures to allow for the further assessment of alternatives (e.g., Feeder Repair by Weld

Overlay), changes in the scheduled delivery of capital spares, and reduced capital expenditures on various projects. The 2013 project portfolio budget established in the business plan approved in 2012 is \$234.5M but 2013 results to-date indicate that this will be exceeded. The 2014 project portfolio budget is \$276.1M. The higher projected 2013 and 2014 amounts reflect an increased number of projects required to support station demands which include Fukushima related projects and the purchase of additional capital spares to replace end of life components. OPG's ability to undertake a greater number of projects in 2013 and 2014, relative to its experience in 2011 - 2012, is due in part to the transition to an Engineering-Procurement-Construction (EPC) model for certain of these projects, as discussed in Section 3.0 below.

The 2015 approved project portfolio budget is \$228.0M. OPG is currently reassessing its 2015 project portfolio budget and anticipates increases in this budget to address recent emerging requirements for new project expenditures.

**Chart 1**  
**Nuclear Operations Project Portfolio Expenditures**

Line No.	Category	2010 Actual	2011 Actual	2012 Actual	2013 Budget	2014 Plan	2015 Plan
		(a)	(b)	(c)	(d)	(e)	(f)
1	Project Portfolio - Capital	157.0	135.3	145.9	150.3	175.0	122.2
2	Project Portfolio - OMA	124.8	100.5	96.8	84.2	101.1	105.8
3	Total Project Portfolio	281.7	235.8	242.7	234.5	276.1	228.0

In addition to the nuclear project portfolio, there are

- capital expenditures on Minor Fixed Assets, and
- capital and OM&A project-related expenditures on special, non-recurring projects that are managed outside of the project portfolio.

Minor Fixed Assets (see Ex. A2-2-1, section 4.1) are capitalized expenditures on portable assets used in station or support division operations. An example is tooling used for specialized inspection and maintenance services. Minor fixed assets do not require a BCS and are not managed as part of the project portfolio process.

The special, non-portfolio capital expenditure is the completed P2/P3 Isolation Project. The P2/P3 Isolation Project was work undertaken at Pickering in 2010 (when Units 2 and 3 were in the process of being placed into safe storage) to achieve the isolation of operating Units 1 and 4 including modifications to common system controls which are currently located in Unit 2.

Non-portfolio OM&A project expenditures are the Pickering Continued Operations project (see Ex. F2-2-3), the OM&A costs associated with the Fuel Channel Life Cycle Management project ( see Ex. F2-2-3 and Ex. F2-3-1) and the OM&A costs associated with the completed P2/P3 Isolation project referenced above.

### **3.0 NUCLEAR PROJECT MANAGEMENT PROCESSES**

The OPG corporate investment and project approval processes are outlined in Ex. A2-2-1. The nuclear project management processes are developed within that framework

The OPG Board of Directors approves the annual nuclear projects portfolio budget during business planning. The annual nuclear projects portfolio budget is administered by the AISC, which determines project prioritization and allocates portfolio funding to specific projects.

Contingencies are included in the cost estimate included when the business cases (BCS) are approved (see Ex A2-2-1 Section 4.0 Business Case Requirements for Project Release for a description of the approval process for BCS). However, to drive overall cost control, there is no contingency amount included in the overall portfolio budget or when ASIC allocates funding to an individual project. In the event that a project is expected to exceed its approved budget, a request is made by the project manager to the AISC for additional funding. If additional funding is approved, the AISC will re-allocate funding to attempt to stay within the overall project

portfolio budget. For example, such a request could be accommodated by delaying or deferring other projects.

There are five phases to the life cycle of a nuclear project. These phases are discussed below

- **Project Identification** - identify and assess opportunities for project work; funded from base OM&A.
- **Project Initiation** – initial project scope, schedule, and stakeholders are identified with a recommended alternative and conceptual funding allocated from the project OM&A budget. Success at this phase will lead to an allocation of funding from either the project portfolio capital or project OM&A budget.
- **Project Definition** – investigation to determine project scope, perform preliminary engineering, and produce a project cost estimate and project execution plan.
- **Project Execution** – management of engineering, construction and physical execution of the project.
- **Project Close-out and Post-implementation Review** – preparation of project closure report and Post-Implementation Review to document final costs and lessons learned.

A project's movement through these five phases is monitored by the AISC which ensures that periodic and systematic reviews are conducted, and that approvals (in accordance with OPG's project management process) are obtained before proceeding to the next phase.

As part of its project management process, OPG uses cost estimate ranges that are consistent with industry best practices as reflected in the Association for the Advancement of Cost Engineering (AACE)<sup>1</sup> guidance for the stages of the project life cycle. For example, a project released as a "definition" phase release would have an accuracy range of -20 per cent and +30

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<sup>1</sup> Footnote 1: AACE International is a non-profit professional association. Since 1956, AACE International has provided its members with resources to improve performance in the disciplines of project management, estimating, risk management and claims.

per cent where as projects at the “execution” phase might have an accuracy range of -15 per cent and +20 per cent.

Given the amount of assessment and engineering completed at each state of a project life cycle, OPG works to ensure that project scope is appropriately defined prior to the next stage in the process. Except in unique circumstances, a project is generally not approved for execution until project engineering, scope definition and planning execution is sufficiently complete. The scoping process, combined with the ongoing AISC review and approval processes, enhances OPG’s ability to bring projects to completion within budget and on schedule.

OPG undertakes initiatives to continuously improve the performance of its project management function. These initiatives include:

- a) The implementation of an Engineering Procure and Construct (EPC) model with vendors for various projects. This model provides OPG with an ability to execute additional project work and provides a single point of accountability for the complete delivery of a project. This model is consistent with industry practices and enables OPG to concentrate its resources and efforts on project management oversight.
- b) The implementation of daily Leadership Review and Project Challenge meetings. These daily meetings were introduced in 2011, and include the designers, contractors and other stakeholders. They allow OPG management to promptly resolve execution issues. This results in lower delay and rework costs for nuclear projects.
- c) The negotiation of lower labour rates with vendors.
- d) A Business Transformation initiative to standardize and streamline the preparation of business case documentation. This allows project managers more time to focus on project management execution.