Board Staff Interrogatory #158

Interrogatory

Reference:
Exhibit D2 / Tab 2 / Schedule 10 / p. 106

Preamble:

OPG stated that the Pickering D2O storage project installed four 90 m^3 tanks in an existing building with existing support services. This project was initially estimated to cost $11.2 million. The project was delayed 18 months and ultimately cost $16.3 million.

OPG also stated that the Bruce D2O project installed six 135 m^3 tanks in an existing building with existing support services. This project was initially estimated to cost $13 million. At the time that the estimate for the 2011 Draft Developmental BCS was being prepared, the Bruce project was still ongoing, but it was anticipated to cost $40 million and had experienced years of delay because it had been placed on hold for 18 months.

Question(s):

a) How would OPG characterize the size and complexity of the Darlington D2O storage facility relative to that of the Pickering and Bruce D2O storage facilities cited in the reference above? How much larger and more (or less) complex is it?

b) Who (i.e. which organization) developed the initial scope, cost and schedule estimates for the D2O Storage Project? Was it the same organization that developed the estimates for the Pickering and Bruce storage projects?

c) On what basis were the initial scope, cost and schedule estimates for the D2O Storage Project developed?

d) How was the experience / lessons learned of the Pickering and Bruce D2O storage facilities reflected in the Darlington D2O Storage Project's estimates?

Response

a) By every measure, the D2O Storage Project was much more complex and larger than the projects at Pickering or Bruce. For example:

i. The D2O Storage Project involved construction of an entirely new facility with a seismic dike 13m below ground, on a challenging site (e.g., water ingress, tritiated soil and a congested area) with entirely new systems (see D2-2-10 p. 6, Figure 1). Both the other projects referenced involved placing additional tanks in an existing building with existing support systems.

ii. The D2O Storage Project involved integration with the HWMB/TRF. Beyond the physical piping connections (requiring construction of a seismically qualified underground pipe chase and breaching the HWMB seismic dike), this involved complete integration of the instrumentation and controls between the two facilities so the D2O Storage facility could be operated and monitored remotely from the HWMB control room.

iii. The D2O Storage Project contains almost six times the storage of the Pickering project and more than two and a half times that of the Bruce Project.

iv. The D2O Storage Project stores six different streams of heavy water that must be kept and moved separately. These streams of heavy water are as follows: 1) Primary Heat Transport ("PHT"); 2) Moderator 3) TRF Feed 4) TRF Product; 5) Downgraded D2O; and 6) D2O Cleanup. Only the first two of these streams (PHT and Moderator) were addressed in the Bruce and Pickering projects.

b) The initial scope for the D2O Storage Project was developed by the Nuclear Refurbishment Organization. The initial schedule was based on the needs of DRP and incorporated the preliminary schedule developed by Black & McDonald. The initial cost estimate was developed by the Nuclear Projects Organization based on costs developed by Black & McDonald and contained in the EPC contract. To OPG's knowledge, none of the organizations listed in this answer were involved in the Bruce or Pickering projects.

c) The initial scope was developed based on the Preliminary Design Requirements and Conceptual Design Report. The initial cost estimates were based on the EPC contract signed with Black & McDonald. The initial schedule was driven by the needs of the DRP and based on the preliminary schedule contained in the EPC contract signed with Black & McDonald.

d) As discussed in the evidence (Ex. D2-2-10, pp. 42,106), the experience from the Bruce and Pickering projects was considered in developing the cost estimates and conceptual design of the D2O Storage Project.