COMPARISON OF NUCLEAR OUTAGE OM&A

1.0 PURPOSE
This evidence presents period-over-period comparisons of outage OM&A broken down by station.

2.0 OVERVIEW
This evidence supports the approvals sought for nuclear outage OM&A. Exhibit F2-T2-S2 Tables 1a, b and c set out the comparisons of nuclear outage OM&A for the historical, bridge and test years. Exhibit F2-T4-S2 Tables 2 - 10 set out outage OM&A costs by resource type for calendar years 2007 - 2012. Definitions of the resource types are found in Ex. F2-T4-S1.

The scope of outage work over the 2007 - 2012 period is different in each year, reflecting various inspection and maintenance activities (fuel channels, steam generators, and turbine/generators). The largest component of outage OM&A is typically Other Purchased Services, which represents contracted services from external contractors and work performed by OPG’s Inspection and Maintenance Commercial Services group (“IM&CS”). As discussed in Ex. F2-T4-S1, the cost of IM&CS outage work for OPG generating stations is captured as a component of each station’s outage OM&A costs.

There are a number of reasons why comparing the year-to-year variation in outage OM&A amounts budgeted or spent is not meaningful. First, while there are many standard elements of outage scope (see Ex. E2-T1-S1), there can also be unique activities, programs or major equipment campaigns that are unit-specific, such as single fuel channel replacement. Second, the scope of an individual outage is primarily a function of the unit’s condition at a point in time. Units do not necessarily age or deteriorate in a uniform way or at a uniform rate. For instance, it is highly unlikely that the outage scope for a particular unit in a certain year of operation will precisely match the outage scope for a different unit in the same year of its operation. Third, a major driver to the variability in Pickering B outage OM&A costs over the period 2010 - 2012 will be activities in support of Continued Operations.
For these reasons, the following explanations of the year-over-year variances in outage OM&A costs are limited to a description of the differences in scope and duration of the outages in each year.

3.0 PERIOD-OVER-PERIOD CHANGES – TEST PERIOD

2012 Plan versus 2011 Plan

Outage OM&A expenditures are forecast to decrease by $13.7M (6.4 per cent) in 2012 plan compared to 2011 plan. The main drivers to this decrease in outage OM&A costs are as follows:

- Pickering A: Outage costs are expected to be flat year-over-year for 2012 as compared to 2011. Pickering A is forecasting additional outage costs for feeder replacements in 2012 compared to 2011 ($8.0M) but this is offset by lower costs due to reduced life cycle management work in 2012 (i.e., reduced inspection programs such as wet scrapes and boiler inspections).

- Pickering B: Outage OM&A costs are forecast to decrease by $8.6M (9.1 per cent) in 2012 compared to 2011. This reduction is primarily a function of the fact that the single fuel channel replacement undertaken in 2011 will not be repeated in 2012. As well, there is less outage scope in 2012 as a result of less spacer location and relocation (“SLAR”) related to the Continued Operations initiative in 2012 compared to 2011.

- Darlington: Outage OM&A costs are forecast to decrease by $5.1M (7.9 per cent) in 2012 as compared to 2011. This decrease is primarily due to savings from undertaking fewer feeder replacements in 2012 compared to 2011.

2011 Plan versus 2010 Budget

Outage OM&A expenditures are forecast to decrease by $69.9M (24.5 per cent) in 2011 plan compared to 2010 budget. The main drivers to this decrease in outage OM&A costs are as follows:

- Pickering A: Outage costs are expected to be lower by $16.7M (24.3 per cent) in 2011 as compared to 2010 primarily because costs incurred in 2010 related to the Pickering vacuum building outage (“VBO”) will not be repeated in 2011. Pickering A will also have
reduced outage costs in 2011 as it does not intend to undertake a turbine replacement program (savings of $6.5M).

- Pickering B: Outage OM&A costs are forecast to be higher by $1.6M (1.7 per cent) in 2011 compared to 2010 primarily due to an increase in expenditures for Continued Operations (e.g., additional SLAR). Also, Pickering B’s outage costs in 2011 include additional costs ($10M) for a single fuel channel replacement. However, Pickering B’s outage costs in 2011 are favourably impacted compared to 2010 because of costs incurred in 2010 relative to the Pickering VBO.

- Darlington: Outage OM&A costs are forecast to decrease by $42.6M (39.9 per cent) in 2011 compared to 2010 primarily as a result of the 36-month outage cycle, as there will be only one planned outage in 2011 compared to two planned outages in 2010. In addition, 2011 outage costs are lower as 2010 includes turbine blade replacement costs.

The 2010 budget also includes a forecast Nuclear Level Common outage OM&A expenditure of $10.0M. There is no Nuclear Level Common cost forecast in 2011. The $10M Nuclear Level Common outage OM&A expenditure in 2010 represents an amount held by the Chief Nuclear Officer in reserve related to the Pickering 2010 VBO.

4.0 PERIOD-OVER-PERIOD CHANGES - BRIDGE YEAR

2010 Budget versus 2009 Actual

Outage OM&A expenditures are expected to increase by $29.8M (11.7 per cent) in the 2010 budget compared to 2009 actual. The main drivers to this increase in outage OM&A costs are as follows:

- Pickering A: Outage costs are expected to be higher by $4.6M (7.1 per cent) in 2010 compared to 2009 primarily due to the 2010 Pickering VBO ($19.3M) offset by higher costs in 2009 due to scope increases for the Unit 4 outage.

- Pickering B: Outage OM&A costs are forecast to be higher by $19.5M (26.7 per cent) in 2010 compared to 2009 primarily because additional costs (e.g., inspection and maintenance services) will be incurred in 2010 related to scope increase for the Pickering VBO along with 2 feeder replacements.
• Darlington: Outage OM&A costs are forecast to be lower by $3.1M (2.8 per cent) in 2010 compared to 2009, primarily because costs incurred in 2009 related to the four unit VBO will be avoided in 2010 and there are avoided IM&CS inspection costs for the calandria, single fuel channel replacement (“SFCR”) and feeders. A partial offset to these lower costs is that Darlington will have two planned outages in 2010 compared to only one planned outage in 2009 as a result of the 36-month outage cycle.

The 2010 budget also includes a forecast Nuclear Level Common outage OM&A expenditure of $10.0M for the 2010 Pickering VBO. There was no equivalent Nuclear Level Common expenditure in 2009.

5.0 PERIOD-OVER-PERIOD CHANGES – HISTORICAL PERIOD

2009 Actual versus 2009 Budget

Actual outage OM&A costs in 2009 are $46.9M (22.6 per cent) over budget. The main drivers to the variance between actual and budget 2009 outage OM&A costs are as follows:

• Pickering A: Actual outage OM&A costs are higher by $3M (4.7 per cent) compared to budget. In 2009, higher outage costs were incurred due to scope increases related to the Unit 4 outage, as well as additional work in 2009 due to the deferral of fall 2008 outage, partially offset by the deferral of the replacement of four feeders ($4.0M) which had been included in the 2009 budget.

• Pickering B: Actual outage OM&A costs are higher by $2.4M (3.4 per cent) compared to budget primarily due to unbudgeted outage OM&A expenditures for Pickering B Continued Operations.

• Darlington: Actual outage OM&A costs are higher by $38.0M (52.9 per cent) compared to budget primarily due to increased expenditures for overtime and purchased services during the VBO. The 2009 VBO budget that was filed in EB-2007-0905 was prepared one and one-half years in advance of the VBO and did not contemplate the additional scope additions that were made as part of the final VBO work plan. The VBO was also subject to unanticipated equipment degradation that resulted in critical path delays and Unit 3 planned outage schedule delays on inspection programs. Darlington also experienced additional costs for unbudgeted work related to single fuel channel replacement;
increased inspection and maintenance costs (boilers/turbine), and increased costs for feeder replacements.

2009 Actual versus 2008 Actual

Actual outage OM&A costs in 2009 were $254.8M, which is an increase of $58.7M (29.9 per cent) over actual outage OM&A costs in 2008 of $196.1M. With respect to year-over-year comparisons between 2009 and 2008, the key drivers were:

- Pickering A: Actual outage OM&A costs in 2009 were higher by $39.1M (156.4 per cent) compared to 2008 due to the deferral of the fall 2008 outage into 2009, higher costs due to scope increases for the Unit 4 outage, and costs incurred in 2009 related to preparation for the 2010 VBO ($2.0M).
- Pickering B: Actual outage OM&A costs in 2009 were lower by $9.9M (12 per cent) compared to 2008 due to no feeder replacements in 2009 offset by increased inspection and maintenance costs and a spindle refurbishment, and $2.8M expenditure for Pickering B Continued Operations in 2009. There were no outage OM&A expenditures on Continued Operations in 2008.
- Darlington: Actual outage OM&A costs in 2009 were higher by $26.5M (31.9 per cent) compared to actual outage OM&A costs in 2008 due to increased expenditures in 2009 for the Darlington VBO, additional costs for an unbudgeted SFCR; increased inspection and maintenance costs and unbudgeted increase in costs due to increase duration and scope of outages in 2009, partially offset by the fact that there was no turbine replacement in 2009.

2008 Actual versus 2008 Budget

Actual outage OM&A costs in 2008 were $3.9 M (2.1 per cent) over budget for OPG’s nuclear fleet. The main drivers to the variance between actual and budget 2008 outage OM&A costs are as follows:
• Pickering A: Budget costs were lower by $23.5M due to the deferral of the fall 2008 planned outage until 2009 ($30.9M), partially offset by the decision to refurbish the spindles in 2008 in advance of the outage.

• Pickering B: Actual outage OM&A expenditures ($82.9M) were $16.2 M more than budget. This is attributable to higher overtime and temporary labour costs related to the advancement of the Unit 7 planned outage as well as higher than budgeted planning and assessing costs to support the Unit 5 2009 planned outage, partially offset by under expenditures on the 2010 VBO outage preparation work.

• Darlington: Actual outage OM&A expenditures ($83.2M) were $10.9M more than budget. This is primarily due to higher costs for planning and assessing work to support the 2009 VBO and higher feeder inspection costs for the 2008 Unit 1 planned outage, partially offset by lower than budgeted outage costs for turbine blade replacement and feeder replacement.

2008 Actual versus 2007 Actual
Actual outage OM&A costs in 2008 were $196.1M, which is a decrease of $19.5M (9 per cent) over actual outage OM&A costs in 2007 of $215.6M. With respect to comparisons between 2008 and 2007, the key drivers were:

• Pickering A: Outage costs were lower by $17.1M (40.6 per cent) in 2008 compared to 2007 primarily due to the deferral of the fall 2008 planned outage until 2009 ($30.9M) partially offset by the decision to refurbish the spindles in 2008 in advance of the outage ($6.3M).

• Pickering B: Outage OM&A costs were higher by $13.3M (19.1 per cent) in 2008 than 2007. In 2008, Unit 7 was subject to a major unforeseen forced outage that required the replacement of a calandria tube in Unit 7. To mitigate the impact of the forced outage, OPG brought forward and completed outage work from the planned Unit 7 fall outage into the forced outage. The higher outage OM&A costs in 2008 compared to 2007 primarily reflect the higher overtime and temporary labour costs related to the advancement of the Unit 7 planned outage.

• Darlington: 2008 outage OM&A costs were lower by $13.9M (14.3 per cent) compared to 2007 reflecting that, as part of the transition to the three-year outage cycle, two units
were on outage in 2007 for a total of 134 days versus only one unit on planned outage in 2008 for a total of 75 days. In addition there was an unbudgeted planned outage in 2007. The 2008 outage OMA costs compared to 2007 were impacted by planning and assessing work undertaken in 2008 to support the 2009 VBO.

2007 Actual versus 2007 Budget

Actual outage OM&A costs in 2007 were $22.1M (11 per cent) over budget for OPG’s combined nuclear fleet, principally due to higher than planned outage OM&A costs at Darlington ($11.4M or 13 per cent). Actual outage OM&A costs were $5.7M (9 per cent) over budget at Pickering B and $1M (2.4 per cent) over budget at Pickering A.

The key drivers behind these budget variances were:

- Pickering A: Outage OM&A was 2.4 per cent over budget reflecting incremental costs for overtime, decontamination services and adjuster rod repairs as well as higher IM&CS costs related to boiler inspections and mobilization costs related to advancing fall planned outage work into the summer inter-station transfer bus (“ISTB”) outage.
- Pickering B: Outage OM&A costs were 9 per cent over budget. Better than budget performance on the Unit 6 fall outage which resulted in outage OM&A cost savings of approximately $5.5M was offset by unforeseen costs arising from turbine spindle repairs, advanced work associated with the Unit 8 spring 2008 outage and costs incurred due to the inadvertent release by a third party contractor of resin into the demineralized water system.
- Darlington: Outage OM&A costs were 13 per cent over budget. A major component of this overage was related to the decision, after the business plan was approved, to utilize regular labour resources for the ongoing maintenance requirements of the running units. This required obtaining additional external contractor services to complete the planned outage work. This approach is consistent with the outage staffing strategy and the need to optimize available base work resources and skills as set out in Ex. F2-T4-S1, section 2. In addition, the Unit 4 outage incurred additional overtime and material costs due to a large amount of discovery work.