Q. **Unit 1 Stack Breeching:** At page 9 of the July 2011 Hydro report, Hydro identifies that typical maintenance repairs have included replacing missing or loose insulating block on the breeching interior, the installation of steel plate patches on the breeching exterior to cover holes caused by extensive corrosion, and applying protective coatings to the breeching exterior.

(a) How much of the Corrective Maintenance costs (per Table 1: Maintenance History) were attributable to the above-identified typical maintenance repairs?

(b) How much of the Corrective Maintenance costs (per Table 1: Maintenance History) were attributable to maintenance repairs or causes other than the above-identified typical maintenance repairs? Provide a breakdown of the costs for each non-identified maintenance repair or other cause for the incurring of the Corrective Maintenance costs.

(c) Will all of the types of maintenance repairs incurred per Table 1: Maintenance History be reduced if Alternative 2 is implemented, so that total maintenance costs (preventative and corrective) for the 9-year CBA period will be $4,000 per year?

(d) At page 8 of the July 2011 Hydro report, Hydro identifies that in January 2009, Hydro switched to fuel oil with a sulfur content of 0.7 percent, thereby decreasing the future rate of deterioration. If that is the case, then why is it expected, under Alternatives 1, 3 and 7, that the costs of Corrective Maintenance will on average remain the same for the next 9 years under those Alternatives as it has been for the previous 11 years? Is this expectation supported by any consultant's opinion?

A. (a) Most of the corrective maintenance cost is attributable to replacing missing or loose insulating blocks on the breeching interior, the installation of steel plate patches on the breeching exterior to cover holes caused by extensive corrosion, and applying protective coatings to the breeching exterior. A relatively small portion of the cost is associated with removing deteriorated materials and replacing the cement floor in 2006. Installing the new cement floor at that time cost $30,000.

(b) A relatively small portion of the corrective maintenance costs were attributed to items other than those above. Those costs are related to two items as follows:

Year	Description	Cost ($)
2010	Internal cleaning and debris removal.	2,000 (est.)
2009	No corrective maintenance.	0
2008	Internal cleaning and debris removal.	2,000 (est.)
2007	Internal cleaning and debris removal.	2,000 (est.)
2006	Internal cleaning and debris removal. Replace cement floor.	2,000 30,000
2005	Internal cleaning and debris removal.	2,000 (est.)
2004	Internal cleaning and debris removal.	2,000 (est.)
2003	Internal cleaning and debris removal.	2,000 (est.)
2002	Internal cleaning and debris removal.	2,000 (est.)
2001	No corrective maintenance performed.	0

(c) Yes, it is anticipated that all of the types of maintenance repairs incurred as indicated in Table 1: Maintenance History will be reduced if Alternative 2 is implemented, so that total maintenance costs (preventative and corrective) for the nine-year period will be $4,000 per year. The reduced cost is primarily related to avoiding new insulating block installation, installing steel patches on casing, and replacing cement floor.

(d) Under Alternatives 1, 3 and 7, the costs of Corrective Maintenance will on average remain the same for the next nine years as it has been for the previous 11 years. This was concluded in discussion with the maintenance service contractor and is supported by statements on page B12 of the July report, "... *due to the length of the service life (almost twenty years) and extended exposure to the past prevailing conditions, deterioration of the current liner may continue at the same pace or worse if some upgrades are not implemented. The low service temperature of the adhesive membrane is likely to remain a contributing factor to the insulating block failures"*. The quality of the existing adhesive membrane, its ability to hold existing blocks in place, and the view that there is presently hidden weakness in bonding interface between the adhesive membrane and many blocks presently in place, support this expectation.