Q. Ref: Schedule B, Project Title – Replace Substation Transformer, p. B-48. Please provide the working calculation used to derive the figures provided in the DSM Analysis at page B-50.

A. See working calculation descriptions below.

1. **Peak Demand Forecast** (Net kW) gross system peak less station service. For example in 2004 the calculation is 552 kW – 26 kW = 526 kW.
2. **Domestic customer forecast** is as per load forecast.
3. **Existing transformer capacity** is as per existing equipment rating.
4. **Capital Budget** is as per Hydro's engineering estimates.
5. **Required Demand Savings** is the amount of system load that would have to be saved in order for the existing equipment to be able to continue to reliably provide service. Because we are dealing here with kVa rated equipment, it is necessary to convert net peak to kVa equivalent (assuming a 0.9 power factor), subtract the existing equipment rating, and then convert back to kW for subsequent analysis. For example, the calculation for 2004 is ((526 / 0.9) – 500) x 0.9 = 76 kW.
6. **Capital Budget Deferral Factors** is the applicable percentage reduction to derive the present value of a project's revenue requirement when it is deferred by one year, two years, etc. (at a given inflation rate and cost of capital).
7. **DSM Deferral Budget** is the multiplication of the deferral factor and the capital budget. It represents the maximum amount of money that can be spent on efforts to defer the budget proposal for one or more years, while ensuring a least cost economic criterion. (Note in this Rigolet instance,

the capital cost in 2004$ must first be discounted to 2003$ since that is the base year for the DSM option being applied). The calculation to derive the deferral budget in 2004 would be (($76,000 / 1.068) x .045) = $3,202

8. **DSM Budget per Required kW Savings** brings together the required kW savings and the DSM total budget in order to relate the budget on a required per kW basis. The calculation in 2004 is $3,202 / 76 kW = $42 per kW. Thus Hydro needs to conserve 76 kW on the Rigolet system to defer the transformer upgrade for one year and can spend up to $42 per kW on average to achieve that end.
9. **DSM Supply Costs ($ per kW)** These values represents Hydro's estimates of what it costs for the company to secure DSM resources. The $ per kW is the cost of the DSM resource divided by its diversified demand saving. As would be expected, fuel substitution is relatively expensive while lighting and domestic hot water heater load controls are more economical DSM resources. For example, based on pilot work Hydro has undertaken for domestic hot water heater load control, Hydro expects a cost of $371 per diversified kW demand saving to cover its equipment and program costs. Saving a kW at a customer location also results in savings on losses. When this provision is made the DSM supply cost is reduced to $344 per kW in the case of Rigolet, as historical losses are in the order of 8 percent.
10. **Maximum Achievable Demand Reduction** The DSM achievable demand reduction represents the lowest cost DSM supply option utilized up the maximum DSM budget. Thus with a DSM budget of $3,202 in total for a one year capital deferral, Hydro would expect to be able to procure 9 kW for water heater load control (i.e. $3,202 / $344).
11. **Achievable DSM Versus Required DSM** Where achievable DSM less required DSM is negative, the DSM screening leads to a conclusion that

conservation and load management is not a viable alternative in the circumstance reviewed. In 2004 the calculation demonstrates that Hydro will be 67 kW short of its required demand savings (i.e. 9 kW – 76 kW = -67 kW). The simple test of overall feasibility is to also compare the DSM Supply Cost (per kW) with the DSM Budget (per kW). If the unit DSM supply cost is higher that the unit DSM budget, the conclusion will be that DSM is not viable in the present circumstance.

12. **Comment on Domestic Customers** A system's customer base is used to identify the technical potential of DSM in that system. Where DSM budgets warrant, the least cost DSM will be procured, to its technical maximum given the size of the customer pool, and then the next least cost option is procured, etc.