Q. **Project C-5: Replace Interior Coating of Surge Tank 3**

At page C-6 of Hydro's 2015 Capital Budget Application, Hydro relates that its consultant "identified significant deterioration of the surge tank and recommended welding repairs, corrosion removal and recoating of the interior of the surge tank and riser". Further, at page 4 of Hydro's Report, found at Volume I, Tab 2, Hydro states that the scope of this Project involves, *inter alia*, the "refurbishing of all interior surfaces including surface preparation and coating of the surge tank and riser interior".

However, the Report of Hydro's consultant, Hatch Ltd., states that the "internal inspection revealed that the coating system of the interior of the tank root, shell bowl and riser is in good condition with some minor localized breakdown" and recommends that Hydro refurbish localized areas of coating breakdown of the interior of the tank shell, bowl and riser and apply a compatible coating system.

Why does Hydro maintain that refurbishment of all interior surfaces, including surface preparation and coating of the surge tank and riser interior, is reasonably justified in light of Hatch's recommendations?

A. The nature of the work inside the surge tank is such that it requires a high degree of planning and mobilization effort to ensure safe work execution in a confined space at extreme heights. To minimize risk and to eliminate the need to remobilize in subsequent years, Hydro has planned all of the activities associated with restoring the surge tank interior coating system to occur during a single planned outage.

A full coating application was selected because the major cost in performing the coating rehabilitation is in establishing access to perform the work. The cost to complete the full coating application as compared to the spot coating application is not significantly different. A full coating application is a better long term solution with less outage time for inspection, less maintenance required and a lower probability of recoating in the next 25 to 35 years. Therefore, to achieve maximum value and life of the rehabilitation work, a full recoating is proposed.

A review of the Hatch condition assessment report, in conjunction with the RAT inspection report suggests the coating is in need of repair. The photo below is indicative of the corrosion evident on the interior of the surge tank.

To address the corrosion observed inside the tank as well as the observed pitting of the coating in the riser, two considerations for repairs were made in consultation with a vendor experienced in coating application in wet environments: spot coating and full coating. The vendor indicated that both a spot coat application and a full coating application would require the same surface preparation of the entire tank surface as well as the same spot priming treatment. As a result, the two options would require the following steps:

a) **Spot repair** - water blast the entire surface, spot prime and then apply spot coating; and

b) **Full Repair** - water blast the entire surface, spot prime and apply a full coating.

Cost and Timing

The vendor indicated the cost of the primer and coating system for a full coating is approximately $35,000 to $50,000 which is a small percentage of the anticipated overall construction cost.

Two construction quotes were then obtained from coating contractors experienced in coating water towers at elevations above 200 feet. They both indicated that the majority of the costs associated with this project are related to scaffolding/swing stage set up that is safe for workers and meets occupational health and safety regulations. The construction cost estimates from both contractors were similar in price in the range of $700,000 to $900,000 and the cost to supply the coating product is only about 4-6% of the total construction cost. Accordingly there is little saving in the actual supply of the coating for spot coat versus full coat application. Both spot coating and full coating require a full water blast surface preparation as well as spot primer prior to application of the coating system and therefore the outage time required to complete a full coating and a spot coating are similar. The

time saved between a full coating and a spot coating is not in the surface preparation or the priming but is in the third step: application of the coating system. According to the vendor, if the full application takes approximately 6 weeks to complete, the spot coat application would take 5 weeks, since the time to set up the scaffolding or swing stage, move the swing stage, water blast and spot prime would be the same for both options. The overall cost difference is minimal between the supply and installation of spot coating versus full coating.

Future Maintenance and Inspections

The existing coating was applied in the late 1980's and is currently nearly 30 years old. This exceeds the manufacturer's life expectancy of 15 years for the product that was applied at that time. Multiple discussions with the coating vendor indicate that spot coating will require an inspection at least every two years to ensure the integrity of the existing coating that remains exposed to the elements. A full coating application will require an inspection every five to six years. According to the vendor, a full coating system applied as indicated above will have a life expectancy of 25-35 years, while it is uncertain what the life expectancy of the existing epoxy coating would be if left exposed to the interior tank conditions.

Additional inspections for spot repair translate to increased inspection costs and more frequent outages of Surge Tank 3 and consequently Units 5 and 6. With the uncertainty of the remaining life of the existing epoxy coating, it is anticipated that further spot repairs will be required within the next five to ten years to address additional localized failures of the existing coating. Each spot repair will cost in the order of $1,000,000 and will require a minimum five week outage to address scaffolding /swing stage set up requirements.

Given that the construction costs and outage time for spot coat and full coat are similar, and there are increased outages and costs required for more frequent spot coating inspections, the decision was made to opt for the longer term solution that requires less outage time for surge tank three as well as a lower probability of recoating in the near future. Hydro has determined that the better long term solution for the refurbishment of the tank interior is to water blast the surface, spot prime areas where the coating is weak or has failed and apply a full surface coating.