

From: jasonkean@nalcorenergy.com
To: [Jason R. Kean](#)
Subject: Fw: MWH Preliminary Comments on DG3 Estimate/Schedule
Date: Sunday, March 3, 2013 7:51:39 PM
Attachments: [.png](#)
[NE IE Review Task 5\(1\).docx](#)



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----- Forwarded by Jason Kean/NLHydro on 03/03/2013 07:51 PM -----

From: James Meaney/NLHydro

To: Lance Clarke/NLHydro@NLHydro, Paul Harrington/NLHydro@NLHydro, Jason Kean/NLHydro@NLHydro

Date: 02/18/2013 05:04 PM

Subject: MWH Preliminary Comments on DG3 Estimate/Schedule

Hi Folks

See attached. Rey asked to have a brief call with me late Friday before circulating to the broader group as he was concerned about potential "sensitivities" relating to their comments. Once finalized, these would feed into their IE report (which Canada will receive).

We went through them and I advised that I didn't have any issues with sharing these comments as drafted. For most, I thought their questions/concerns could likely be addressed through a working session with MWH and the Project team or possibly the provision of additional supporting information (note the 3 documents referenced at the top which the review was primarily based on).

I advised Rey that I would pass these comments onto you guys and then we'd circle back with him on next steps. I am in Ottawa tomorrow for FLG meeting, but would you guys be available on either Weds, Thurs or Friday for an internal review? I can come over to Torbay Rd if need be.

Thanks,

Jim



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----- Forwarded by James Meaney/NLHydro on 02/18/2013 04:49 PM -----

From: Reynold Hokenson <Reynold.A.Hokenson@us.mwhglobal.com>
To: "JamesMeaney@nalcorenergy.com" <JamesMeaney@nalcorenergy.com>
Date: 02/14/2013 03:41 PM
Subject: LOWER CHURCHILL-CONFIDENTIAL

Hello Jim,

Please advise when you will be able to talk. I think it best that James Loucks be in on the call since these are his observation and I want to be sure that you understand his current viewpoint. Possibly we could schedule a call tomorrow, if possible for all.

Regards,

Rey



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Nalcor Energy
Lower Churchill Project
Independent Engineer & O&M Contract

Decision Gate 3
Budget / Schedule Review

As part of the Independent Engineer (IE) review of the Lower Churchill Project (LCP), MWH reviewed the following documents with respect to project's Decision Gate 3 (DG3) cost and time models:

- Decision Gate 3 - Capital Cost and Schedule Estimate Summary Report, October 2012
- Decision Gate 3 - Project and Schedule Risk Analysis Report, October 2012
- Lower Churchill Phase 1: IE Kick Off PowerPoint Presentation, September, 2012

Observations

The following observations are made relative to the information conveyed in the *Decision Gate 3 – Capital Cost and Schedule Estimate Summary Report*:

- The summary cost components describing the “Project Estimate” as shown in Figure 1 are inclusive and customary relative to industry practice. As noted, interest during construction (IDC) is excluded from the cost estimate. Presumably, IDC is carried as an owner's expense outside of the management reserve.
- The provided definitions and terms used are consistent with industry practice.
- The methodology applied to the cost estimate, risk analysis and schedule development meets or exceeds industry standards and established best practices.
- The use of an outside specialty consultant to investigate and quantify project risk issues is recognized as enhancing the quality and integrity of the deliverables.
- The project cost estimate attributes and characteristics as described in Table 2 are consistent with AACE Class 3 criteria with the noted exception of the indicated “...high level of precision” attribute. Legacy experience with large civil works indicates that high precision is difficult to achieve or quantify at this early life-cycle stage.
- The indicated cost estimate methodology as “bottoms-up” or definitive is considered the most appropriate and defensible pricing approach for the DG3 cost estimate and consistent with Class 3 criteria.
- The narrative provided in Section 8.2 that describes the estimating inputs and level of outside expertise solicited for the productivity inputs meets or exceeds the threshold for a Class 3 cost opinion.
- The project benefits from a world class team of participants and stakeholders working together as a project team to execute and commission a critical regional asset.

Comments

The following comments are made relative to the information conveyed in the *Decision Gate 3 – Capital Cost and Schedule Estimate Summary Report*:

- The text on pg. 11 indicates that the AACEI has not published a cost estimate classification and references Recommended Practice No. 17R-97 as the basis for classification of the DG3 cost estimate. The AACE has published a cost estimate classification system as Recommended Practice No. 18R-97. Perhaps, the disconnect resides in the desire for a specific cost estimating classification system for heavy civil works as opposed to process facilities, which 18R-97 addresses. Minor issue that doesn't necessarily require resolution.
- As noted in Table 2, pg. 15, the 7% indicated P50 "estimate contingency" is considered aggressive or low by a factor of 100% relative to legacy experience with similar projects. While the project benefits from a robust analytical risk analysis effort and some fixed pricing, the low contingency recommendation is considered non-customary and undermines confidence for the cost opinion. The issue is flagged as critical for reconciliation.
- The project team's extensive qualitative risk identification effort is recognized as extensive and best practice, but it's not clear how the qualitative efforts were quantitatively captured in the cost estimate and/or contingency recommendation. Further Investigation of the Monte Carlo simulation inputs (cost estimate and schedule) would support a better understanding of the applied methodology and implied contingency recommendations.
- A means to communicate what specific mitigation schemes and/or allowance reserves are incorporated within the DG3 cost estimate or the management reserve would help to support or explain a lower contingency recommendation and provide additional confidence in the cost/time models.
- The existence of a management reserve allowance is unclear. Communication as to location and working amount of the allowance to mitigate changed conditions during field execution would provide additional confidence in the cost estimate.
- As noted in Table 2, the percentage of historical or spent costs to the total estimated project cost of the project at approximately 3.0% is not considered significant to mitigate a traditional contingency recommendation in the range of 12.5% to 17.5%.
- Not clear from Table 4, how general condition type costs representing the mobilization, winterization, and field office oversight indirect costs are carried in the cost estimate. Some general condition costs, but not all expected, are shown for the MF contract, but similar type expenses are not shown at all for the LITL and LTA contracts. For heavy civil projects of this scale and complexity, the general condition costs typically run from 10% to 20% of directs. The issue requires reconciliation and is flagged as important.
- As shown in Table 4, the metric of the owner's soft costs (e.g., General) at \$697M expressed as a function to the program's total costs (\$4,608.17M) at 15% is significantly less than expected based on similar program experience. Typically, the ratio of construction costs inclusive of contingency to all-in program costs exclusive of IDC ranges from 2.0 to 2.5 vs. the 1.15 ratio for LCP. This disconnect requires further investigation and reconciliation and is flagged critical.

- The notion that labor availability is a strategic risk or a project issue that is out of the owner's control relative to a tactile or tangible risk can be debated. As a known issue, best practice dictates that mitigation schemes be inclusive within the cost estimate to train, attract, motivate and retain the craft work force. Communication that cost mitigation is inclusive within the cost estimate for maintaining labor productivity and retention would promote confidence for the reported project cost.
- The assumption that the published cost estimate range should reside between the P10 and P90 end points is not customary and unknowingly implies greater estimating accuracy (-12% to + 13%) to decision makers relative to AACEI standard practice and legacy experience.
- While project opportunities can offset project risks, typically opportunities are discounted by the distribution algorithms to provide conservatism and measure into the cost estimate range. As such, an understanding into the treatment of opportunities as opposed to risks would provide additional basis to discuss and rationalize the estimate contingency recommendation.
- An improved and robust project cost escalation scheme is described and applied to the project. While the sophistication is appreciated, the implied average annual escalation rate of approximately 2.5% is considered somewhat aggressive relative to standard practice and the notion that the current economic recovery will not significantly impact the project cost model. As such, the well-reasoned analysis may need to be tempered or cross-checked against improving economic conditions that dictate that a higher annual rate be utilized. That is, the likelihood that actual annual escalation will exceed the implied allowance is considered high.
- The basis for understanding the level of prime and subcontractor markups and/or compounding adders applied to the cost estimate was not detected at the cost estimate summary level and is seen as relevant to assessing the reasonableness of the cost opinion.
- The significance of realizing completion for LCP scope is not known relative to what the cost estimate assumes and what the contracting strategy can deliver. That is, what mitigations or allowances are contained within the cost estimate for less than optimum competition if three or more competitive tenders are not received?
- It doesn't appear that the project schedule incorporates the sub-Project packaging strategy described in Section 10 to organize and manage the project timeline. Additionally, the schedule's incorporation of the project's critical planning and/or decision points would work to enhance project execution and confidence in the estimated project duration.
- A Basis-of-Schedule document or discussion would communicate to an independent reviewer the basic assumptions employed in the project schedule. It's unclear as to what calendars, what assumptions, and/or weather constraints were factored into the developed schedule. Also, how was the uncertainty analysis factored into or contingency applied to the timeline? Finally, the schedule doesn't appear to capture program activities such as ROW acquisition, engineering, permitting or similar pre-construction tasks as constraints or predecessors to the field execution tasks.
- The Westney presentation indicates that the cost estimate qualifies as an AACEI Class 2. The IE working assumption is that the cost estimate qualifies as Class 3.

Analysis Exclusions

The IE review of the project's cost estimate and schedule did not focus on the following due to budget and/or input constraints:

- Validation of the cost estimate's production metrics or crew composites. The details of the cost estimate were not located or time provided to undertake this in-depth review.
- Any detailed review of the quantification of project scope.
- Detailed logic review of the developed P6 schedule as the roll-up schedules provided do not facilitate such an analysis.

Summary

The presented LCP cost and time models are considered satisfactory relative to DG3 methodology expectations provided that explanations and/or backup are provided to address the highlighted issues related to the reasonableness of the stated conclusions of said outputs.

DRAFT