

Manitoba Hydro Undertaking #107

Manitoba Hydro to examine the possibility of providing the terms and conditions of the retainer for the engineering firm reviewing the cost of BiPole III.

Please refer to the attached correspondence between Rashwan Consultant dated December 22, 2010 and R. B. Brennan dated January 5, 2011.

2011 01 05

Dr. Mohamed Rashwan, P. Eng.
President
TransGrid Solutions
200 - 137 Innovation Drive
Winnipeg, Manitoba
R3T 6B6

Dear Dr. Rashwan:



This will confirm our verbal discussion where I agreed with your December 22, 2010 proposal for the review of the Manitoba Hydro cost estimates of the Bipole III Converter Stations. This proposal includes the hiring of yourself and the other two HVDC experts.

Please proceed as soon as possible. I will arrange for Mr. Ken Adams and his staff to provide you with the information requested in Item #6 of your proposal immediately. My Assistant, Shirley Denesiuk, will be in touch with you shortly to discuss the purchase order arrangements.

All further communications should continue to be coordinated through me. Please accept my very best wishes for a safe, happy and prosperous New Year.

Yours truly,



RBB/skw

**Rashwan Consultant
December 22, 2010**

Bipole III HVdc Project

Manitoba Hydro

Attention:

Mr. Bob Brennan

Bipole III Cost Estimate Review

Rashwan Consultant

December 22, 2010

1. Introduction

We are pleased to submit this proposal for the review of the Manitoba Hydro Bipole III converter stations cost estimates. We have put together a team of well qualified individuals to perform the review. Our team is very familiar with HVDC, the present market conditions of converter stations prices, the state of the technology, project implementation and execution.

This proposal is designed as follows:

- The review team
- Review basis
- The scope of work
- Items excluded from the review
- The information and data required from Manitoba Hydro
- Limits of the review
- Schedule
- Price
- Terms of payment

2. Review team

- Mohamed Rashwan
- Dan Lorden (The Energy Initiatives Group EIG)
- Brad Railing (Cross Sound Cable Company LLC)

3. Review basis

For the purpose of this review, the following is assumed:

- Bipole III rating is established at +/- 500 kV and 2000 MW. Therefore no technical discussion will be presented relative to this topic.
- The location of the converter stations is established.
- Any specific technical requirements identified by Manitoba Hydro such as the need for two 12 pulse series connected valve groups per pole and the need for synchronous condensers at Riel will be taken into account. However, the review will not go into why these specific technical requirements have been identified because presumably Manitoba Hydro has done these studies already.
- The length of the HVDC line is approximately 1 364 Km.

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4. Scope of work

We have established the scope of work to be as follows:

- Determine if the project description is optimal
- Review of the cost estimates prepared by Manitoba Hydro for Bipole III converter stations located at Riel and Keewatinoow in summer 2010 based on the project description in section 3 above.
- Establish whether the estimates are in line with HVDC industry cost estimates for comparable projects.
- Review the cost estimates for the synchronous condensers
- Assessment of the cash flow making the estimate
- Review if the in service dates of the various components of the system are optimal or whether different strategy of staging the project would be beneficial. In this regard alternatives for staging the project will be presented. However, a detailed analysis of each alternative will not be included because it requires more studies to establish whether a particular staging alternative meets Manitoba Hydro's target use of the project.

5. Items excluded from the review

We have established that the following items are excluded from this present review. Mainly because Manitoba Hydro would have a very good handle on these costs and in some cases such as the environmental assessment and licensing process it is very dependent on the extent and duration.

- The cost of the design, and construction of the HVDC line.
- The costs associated with environmental approvals and consultation with stakeholders.
- Interest and escalation.
- The costs associated with the construction camp in the North.

6. Information and data required from Manitoba Hydro

We have established that the following is the preliminary list of information and data required from Manitoba Hydro. Obviously as we progress with the review, it may be necessary to ask Manitoba Hydro to provide more specific information or clarification regarding a particular budget or cost item.

- The 2010 cost estimates prepared by Manitoba Hydro for the Bipole III converter stations, the synchronous condensers, the electrodes, and any other items that are part of the budget of the converter stations.
- The basis for establishing the cost for each item, meaning what is included in the specific budget item.

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- Any assumptions or any specific technical requirements other than our assumptions stated in section 2 “review basis”.
- There may be a need for face to face discussions with Manitoba Hydro to understand the reasons behind establishing a specific cost item.

7. Limits of the review

The review does not include any technical review of the requirements of Manitoba Hydro, or the rating and the voltage selection. It will also limit the discussion on any staging alternatives to the presentation of these alternatives but not giving a detailed analysis of each alternative, because it requires more studies to establish whether a particular staging alternative meets Manitoba Hydro’s target use of the project.

8. Schedule

We can start the review on Monday January 17th, 2011, provided we receive the required information. A draft report can be ready by Friday February 4th, 2011.

9. Price

We have estimated that the number of man-days for the review process is a maximum 30 man-days (240 man-hours); however, we will invoice Manitoba Hydro only for the number of hours that are used for the review with the limit of 240 hours. The hourly rates for the team members are:

- Mohamed Rashwan 150 \$ Canadian
- Dan Lorden 200 \$ US
- Brad Railing 200 \$ US
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A fixed US\$ exchange rate of 1.05 will be used for billing Manitoba Hydro in Canadian dollars.

If there is any need for Dan Lorden or Brad Railing to travel to Winnipeg, we will seek Manitoba Hydro’s approval and all travel costs will be invoiced at cost against the receipts.

10. Terms of payment

The first invoice will be sent to Manitoba Hydro after completion and submission of a draft report for the hours consumed until that moment in time. Any hours

**Rashwan Consultant
December 22, 2010**

Consumed until the final report is issued will be invoiced by a second invoice. The payments are due in 30 days.

Invoices related to travel will be done separately with the appropriate receipts.