

Need for a Bipole III rating of 2300 Mw to transmit Keeyask power.

Introduction

Further to the “**Technical Assessment of the Need for the Bipole III Line, dated 21 November 2014- Dennis Woodford P. Eng.**” **Electranix Corporation**, this paper will provide another option that will produce additional savings for the Bipole III project while still meeting all reliability criteria as well as providing sufficient HVDC capability to transfer the Keeyask power and provide increased transmission surplus above that which now exists.

Options

- The 21st November 2014 report concludes that there is no need for the Bipole III line for reliability with the (MMTP) line in service as Keeyask power and energy can still be delivered for export to the USA with the Bipole III converters connected to one of the existing Bipoles I or II transmission lines.
- Reduce the rating of Bipole III from 2300 Mw to 1150 Mw.

Rational

NFAT- Final Report “**item 4. The Panel recommends that the Government of Manitoba not approve the construction of the Conawapa Project and the North-South Transmission Upgrade Project.** Given the Panel’s view that the Conawapa Project has no place in future plans or strategies, there is no need to continue any activity to protect a future in-service date. Nor should existing sunk costs become a future justification for Conawapa.”

In view of the above, “there is no need to continue any activity to protect a future in-service date,” related to Conawapa.

Therefore, there is no justification to provide HVDC converter capacity, of (2300 MW) resulting in surplus of 1970 MW.

Nelson River & HVDC Capacities

Present

- **Nelson River System capacity** **3500 MW**
- **Bipoles I & II transfer capacity** **3800 MW**
- **Surplus** **300 MW**

Manitoba Hydro Option

Keyask

- **Nelson River System capacity** **4130 MW**
- **Bipoles I, II & III(2300MW)transfer capacity** **6100 MW**
- **Surplus** **1970 MW**

Proposed Keyask Option

- **Nelson River System capacity** **4130 MW**
- **Bipoles I, II & III(1150MW)transfer capacity** **4950 MW**
- **Surplus** **820MW**

Reliability

In regard to reliability Figure 1-3 from the Manitoba Hydro Report: October 2010, Ultimate HVDC Development in Manitoba, page 34 is reproduced and shown below. In addition the figure is redrawn with an 1150 MW Bipole III as well as including the (MMTP) line in Figure 1-3a.

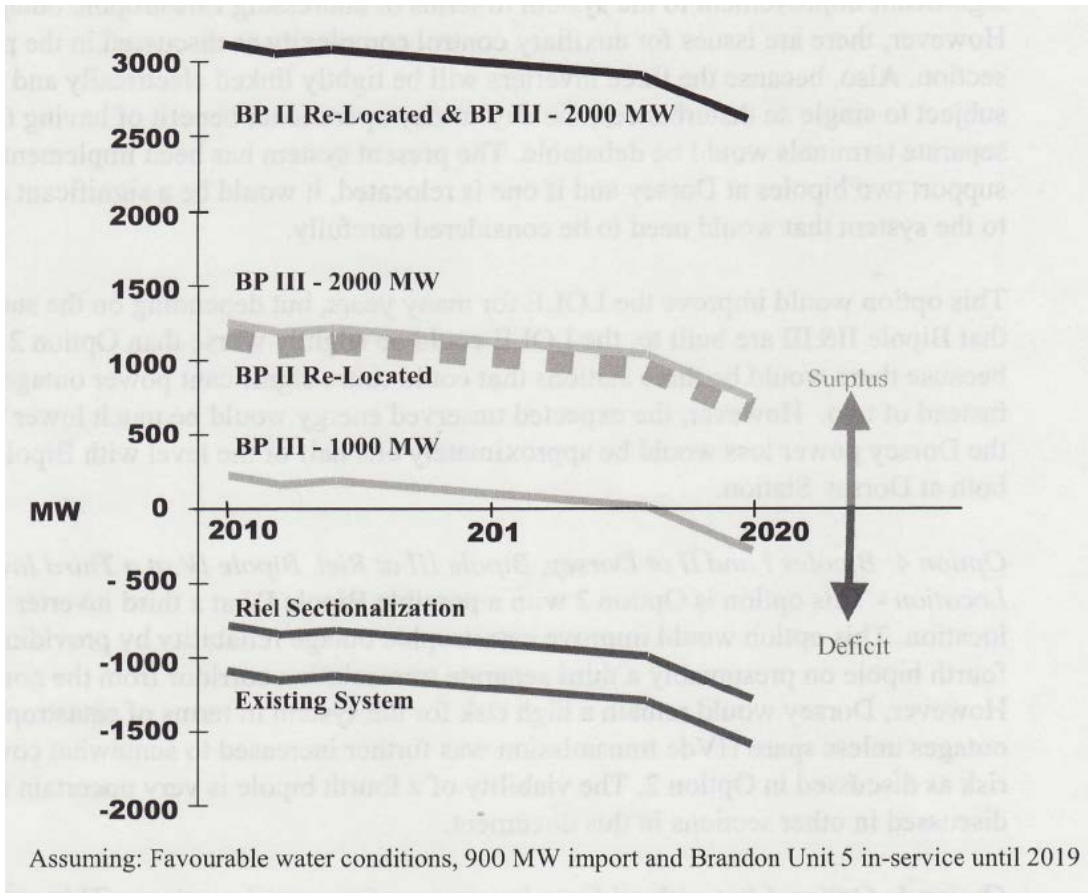


Figure 1-3: Making up the Shortfall of Power during a Catastrophic Dorsey Outage in Winter: Manitoba Hydro Report: 14 October 2010, Ultimate HVDC Development in Manitoba, page 34

Graph With Bipole III at 1150 MW and Manitoba Minnesota Transmission Project (MMTP)

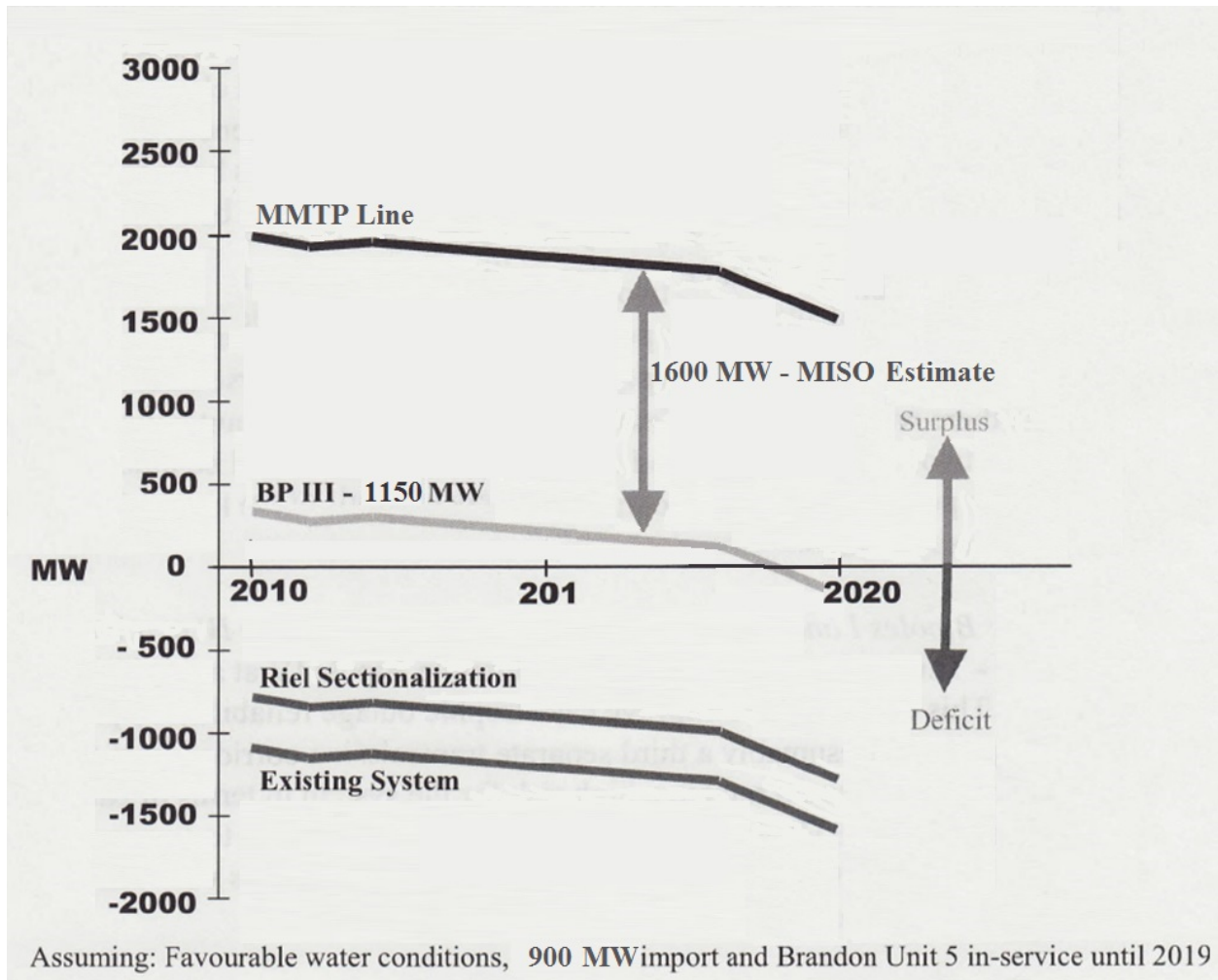


Figure 1-3a: Making up the Shortfall of Power during a Catastrophic Dorsey Outage in Winter: Manitoba Hydro Report: 14 October 2010,

It is evident that an 1150 MW Bipole III provides sufficient surplus when taken in combination with the two 500Kv interconnections to the USA for the loss of Dorsey Bipoles I & II. In addition this Figure is based on a much higher forecast.

Reduced Capital Requirements

- **Bipole III transmission line approximately 1.6 billion dollars minus moneys already spent and cancellation fees.**
- **Reduce rating of Bipole III Converter stations to 1150 Mw from 2300 Mw approximately one billion dollars minus moneys already spent and cancellation fees.**
- **Based on the latest Capital costs of Bipole III of 4.6 billion dollars this would reduce these requirements in the range of 2.6 to 3.0 billion dollars.**

Summary and Conclusions

The need for the Bipole III transmission line as well as the 2300 MW rating for Bipole III must be reconsidered by Manitoba Hydro in view of the information in the Report Technical Assessment of the Need for the Bipole III line as well as the need for 2300MW Bipoles as 1150MW Bipoles would be adequate, since Conawapa may never be built.

Art Derry
7th December 2014.

APPENDIX

CONNECTION OF 1150 MW BIPOLE III CONVERTERS TO EXISTING BIPOLES I & II HVDC TRANSMISSION LINES WITH KEYASK IN SERVICE AND THE MMTP LINE TO MINNESOTA IN SERVICE FOR CONTRACTS TO MINNESOTA POWER AND RELIABILITY TO MANITOBA

BIPOLE III TRANSMISSION LINE NOT REQUIRED

