



Addendum to Joint Minot Load Serving Study

Xcel Energy Services; Transmission Planning

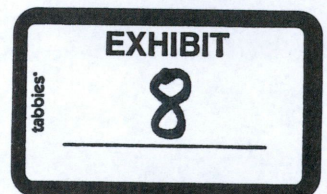
David Brauch Xcel Energy

August 2016

34 **PU-17-102** Filed: 8/18/2017 Pages: 5
**Exhibit 8 - Addendum to Joint Minot Load Serving
Study (August 2016)**

Northern States Power Company

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This addendum has been prepared to clarify the phased approach to constructing the facilities identified in the Joint Minot Load Serving Study (Minot Study)(dated March 27, 2015) as necessary to address the transmission issues in the Minot area. The Minot Study included recommendations for proposed Xcel Energy and Basin Electric Power Cooperative transmission facilities.

At this time, Xcel Energy is proposing to construct a subset of these facilities to address the near term thermal overloads on the McHenry substation 230/115 kV transformer during certain contingency conditions. The facilities proposed by Xcel Energy will also address low voltage conditions on the Souris – McHenry and Souris – Mallard 115 kV lines, which currently serves Xcel Energy’s Minot load, during certain contingency conditions. The tables below summarize the overload and low voltage conditions that will be addressed with these proposed near term upgrades.

Figure 1 below shows the current facilities serving the load in and around Minot. The critical current and near term contingencies are also shown on Figure 1 and are numbered 1-7. The seven contingencies shown generate both thermal and voltage concerns for the loads in the Minot area.

Figure 1

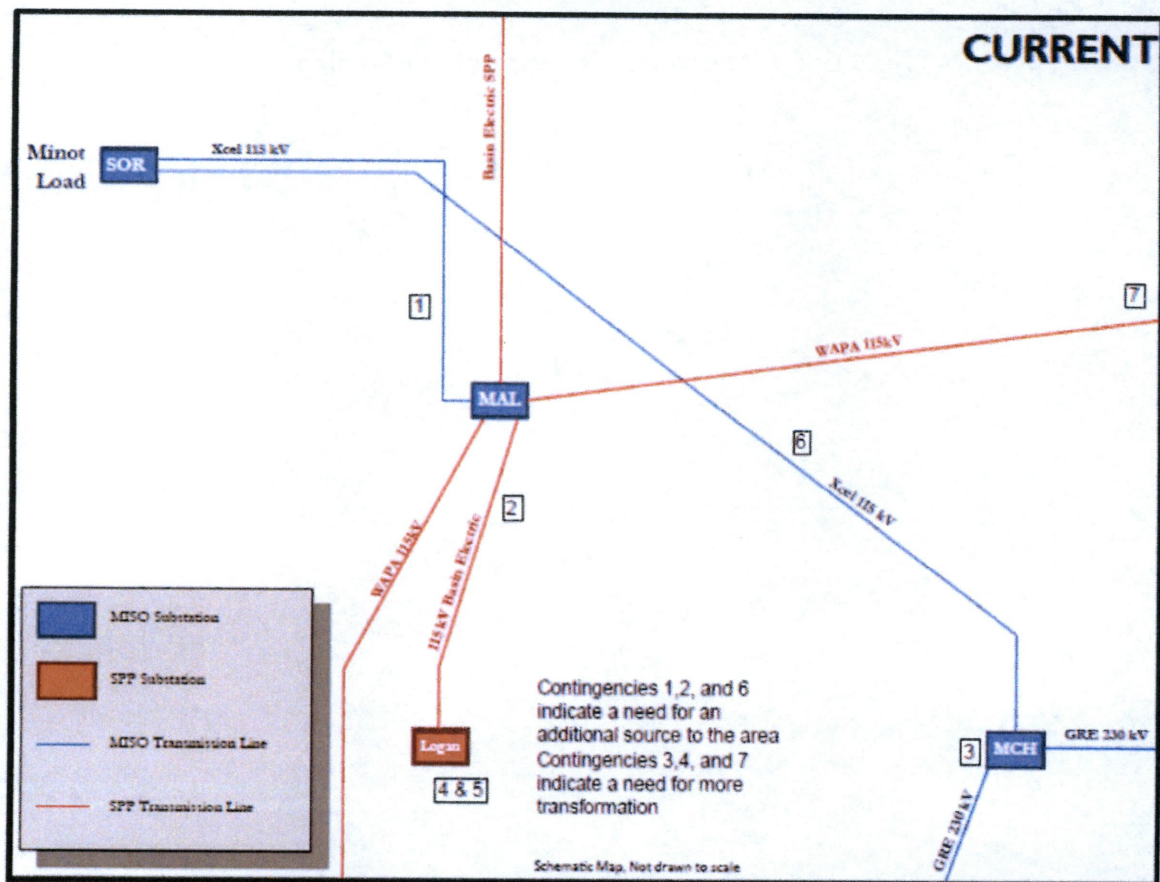


Table 1

Transmission Line	Contingency Label	Voltage	Voltage Drop	Contingency
Souris-McHenry 115 kV line		94.58		System Intact
	1	86.44	8.13	Loss of Souris to Mallard 115 kV
	2	80.66	13.91	Loss of Mallard to Logan 115 kV
	3	87.99	6.58	Loss of McHenry 230/115 kV Transformer
	4	89.07	5.51	Loss of Leland Olds to Logan 230 kV
	5	86.2	8.38	Loss of Logan 230/115 kV Transformer
	6	89.07	5.51	Loss of Souris – Velva – McHenry 115 kV
Souris-Mallard 115 kV line		94.86		System Intact
		80.18	14.86	Loss of Mallard to Logan 115 kV
		89.54	5.32	Loss of McHenry 230/115 kV Transformer
		90.83	4.03	Loss of Balta to Rugby 230 kV
	7	90.66	4.2	Loss of Ruby 230/115 kV Transformer
		89.09	5.77	Loss of Leland Olds to Logan 230 kV
		86.06	8.8	Loss of Logan 230/115 kV Transformer
	90.69	4.17	Loss of Souris – Velva – McHenry 115 kV	

Please note that the minimum acceptable voltages on a transmission line under contingency conditions is 92 percent. As shown in Table 1, under the seven different contingencies, the voltage on either the Souris-McHenry 115 kV line or the Souris-Mallard 115 kV line drops below 92 percent and these facilities experience low voltage conditions.

Table 2 below documents the overloads observed on the McHenry substation 230/115 kV transformer. The transformer should not exceed 100 percent of its ratings. As shown in Table 2, under system intact conditions and in a variety of contingency conditions, this transformer experiences overloads.

Table 2

Circuit Element	MVA Rating	Loading Percent	Contingency
McHenry 230/115 kV Transformer	84.0	114.6	System Intact
		160.4	Loss of Souris to Mallard 115 kV
		178.7	Loss of Mallard to Logan 115 kV
		159.3	Loss of McHenry to Balta 230 kV
		188.2	Loss of Balta to Rugby 230 kV
		154.7	Loss of Rugby 230/115 kV Transformer
		145.4	Loss of Garrison to Voltaire 115 kV
		165	Loss of Logan 230/115 kV Transformer

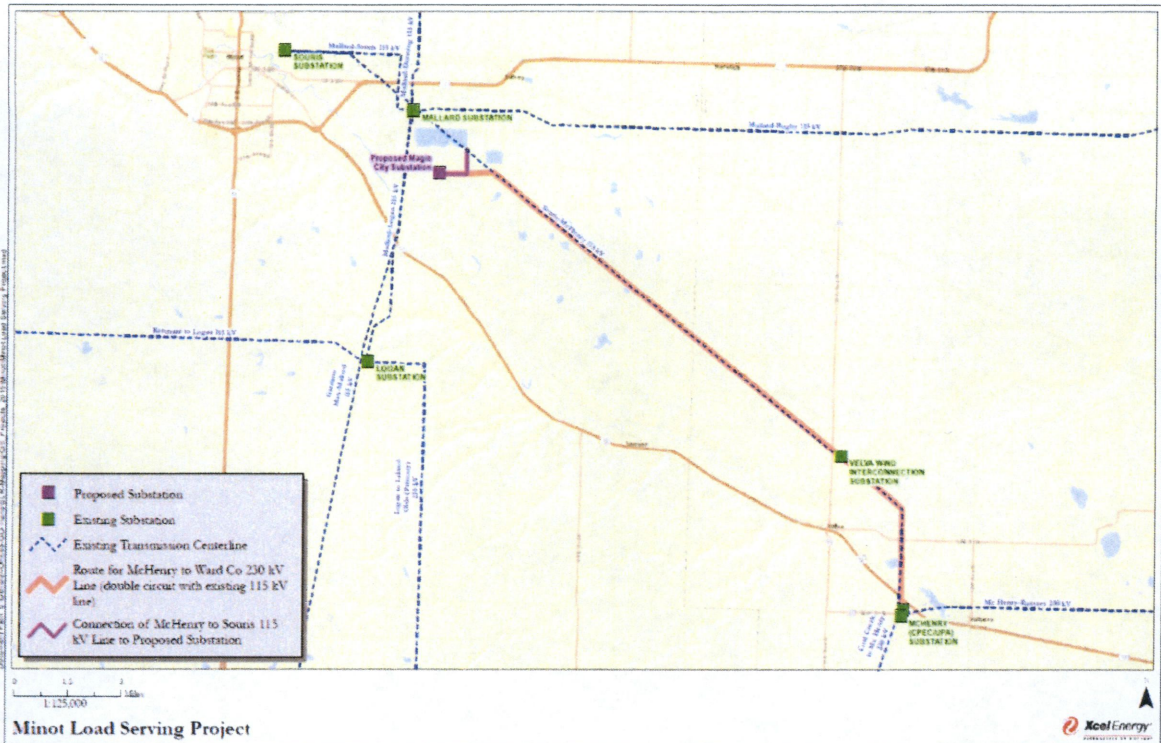
To address these existing and near term overloads and low voltage conditions, Xcel Energy proposes to construct the following facilities in 2018:

- A new 230/115 kV Magic City substation east of Minot; and
- A new 230 kV line connecting Great River Energy's (GRE) McHenry Substation to the new Magic City substation.

Collectively, these facilities are referred to as the Minot Load Serving Project and are shown in Figure 2 below. The new 230 kV transmission line and new 230/115 kV transformer will unload the identified overload facilities as well as provide voltage support to increase the reliability in the area. Specifically, the proposed new 230 kV line between the McHenry Substation and the new Magic City substation will address the low voltage conditions identified in Table 1 by bringing an new source to serve the load in Minot to support voltages and provide capacity for system intact and contingent conditions. The proposed Magic City substation and its new 230/115 kV transformer will relieve the overloads on the McHenry substation transformer by increasing the transformation capacity in the area to support the loads in the area of Minot.

The proposed 230 kV line is to be constructed as double circuited with the existing Souris-McHenry 115 kV line. To avoid taking the existing 115 kV line out-of-service to construct the new 230 kV circuit, the double circuit line would be built parallel to the existing line. Once the new line is in-service, the old 115 kV line will be taken out of service and removed. This will maintain reliable service to area as the proposed upgrades are constructed.

Figure 2



Xcel Energy will continue to monitor the load growth in the area and will propose additional projects as necessary to ensure reliable service in the area.

These potential future improvements are listed below:

- 1) Magic City to Souris 115 kV lines rebuild proposed when the load at Souris exceeds 120 MVA.
- 2) Mouse River Substation and new Souris to Mouse River 115 kV line proposed when the load exceeds the capacity of the existing Souris substation. Currently, Souris has three 50 MVA transformers and distribution forecasts that Souris will exceed its capacity in approximately 10 to 20 years depending on load growth in the area.

Xcel Energy submitted these proposed solutions into MISO's open planning process and were approved as reliability projects in MTEP15.

In addition to the long-term facilities proposed by Xcel Energy, Basin Electric Power Cooperative may also propose to convert their existing Logan – Mallard 115 kV line to 230 kV and interconnect this line into the new Magic City Substation. It is anticipated that Basin will construct these upgrades when they receive Southwest Power Pool (SPP) notice to construct through SPP's open planning process.