US Department of Energy

Western AREA POWER ADMINISTRATION

Upper Great Plains Region

Transmission Planner

Integrated Transmission System

Steady State Local Planning Report

Western South Dakota

2012-2013 Study Cycle

Developed For:

FERC ORDER 890 and NERC Standards TPL-001 through TPL-003

December 2012

Upper Great Plains Regional Office
Transmission System Planning
P.O. Box 35800
Billings, MT 59107

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Executive Summary

The purpose of this study is to satisfy the compliance requirements for FERC Order 890 and NERC standards TPL-001 through TPL-003 [1-3]. This is accomplished by evaluating the near term and long term transmission conditions and identifying system additions needed in the Western, Basin and Heartland Integrated System (IS) to meet network load serving needs.

Western's UGPR Local Transmission Planning Process covers transmission facilities under Western's Tariff contained within both the Eastern and Western Interconnection of Western's Upper Great Plains Region (UGPR). The Local Transmission Plan (LTP) is the transmission plan of the Transmission Providers under this tariff that identifies the upgrades and other investments to the IS necessary to reliably satisfy, over a ten year planning horizon, network load and firm transmission commitments. The IS Local Transmission Planning Process covers those facilities in the Eastern Interconnect. This report covers the IS facilities in Western South Dakota.

The 2012/13 IS Local Transmission Planning Process is conducted on a two year planning cycle beginning in 2012. During the first year a steady-state analysis is completed followed by a prior outage and stability study during the second year of the cycle. This report contains the results from the first year of the study cycle (steady-state). The 2012 steady-state analysis utilized the 2011 MRO series models as the base cases for the study. In 2013 a steady-state assessment will also be completed in order to verify that the solutions identified in the 2012 study are still valid for the recently finalized 2012 MRO series models.

Western is responsible for the development of the transmission plan that results from the 2012-13 planning process. This process incorporates stakeholder input and study group participation in the development of the LTP. In order to ensure that the LTP is a coordinated effort with stakeholder involvement, at least one stakeholder meeting will be held in the spring and fall of each year along with monthly working group meetings to gather comments, guidance and assistance on the planning process. The local transmission plans will roll up to the MAPP Regional Plan in the fall of each year.

Planned and Proposed Projects (Steady State Analysis)

This report includes the steady-state analysis that identified potential N-1 deficiencies in Western South Dakota. The study examined the high voltage (69 kV and above) transmission system in WAPA's control area. The following projects are proposed to meet the Integrated System's network load and firm transmission commitments over the next ten years (2012-2022).

Capacitor Additions:

The following capacitor additions include those identified during the 2011 890 Local Planning Process and the 2012/13 study.

Location	Total Size	Size	In-Service Date**	Notes
Committed Capacitor Projects				
Philip 115 kV*	30 MVar	2x15MVar	Summer 2013	This capacitor addition is a component of the improvements required to remove the UVLS that is currently installed for the Pierre area.

*A base case assumption in models utilized for this study. Results of this study demonstrate that the total size and timeframe identified in the 2011 Assessment are adequate and required to meet voltage criteria.

Transmission Lines:

The following projects were identified as solutions for removing the UVLS at Rapid City and Pierre in the 2011 Assessment. No additional transmission line projects are needed based on the 2012 Local Planning steady-state results.

Location	Distance**	Rating (Norm/Emergcy) MVA	Impedance Values Assumed in Study**			In-Service Date
			R (pu)	X (pu)	B (pu)	
Committed Line Additions						
Rapid City-RCDC 115 kV	7-9 miles	120/132	0.007	0.03	0.0035	2014: This is required to remove the UVLS currently installed at Rapid City
Proposed Line Additions						
Oahe-Ash Sub 115 kV***	3.5 miles	116/116	0.01378	0.04507	0.0055	After 2015: This is being ***proposed*** to remove the UVLS at Pierre for prior outage conditions.

**The conductor type, length and impedance values are based upon existing transmission lines that are assumed to be similar to the new line going in-service. A sensitivity analysis will be required if the T-line characteristics are significantly different than what was modeled in this study.

***Abandon Ash Tap and build line near Ash Tap to Oahe connecting Ash Street directly to Oahe. Other options are being considered.

Line Rating Increases:

There are no line rating increases necessary based upon the 2012 Assessment for the next 10 years. This will be re-evaluated in the 2013 steady-state assessment (2012 MRO Series Models) and any required line uprates will be identified.

Transformer Additions and Replacements:

There are no transformer additions or replacements required that were not already identified in the 2011 Assessment. Based upon last year's Local Planning Study, a parallel 150 MVA 230/115kV transformer at Oahe will be added in 2015 and a parallel 200 MVA 230/115kV transformer at New Underwood by 2014. In June 2012 the Philip transformer was replaced with one sized at 200 MVA.

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