



**Upper Great Plains Region
Transmission Planning**

Integrated Transmission System Local Area Transmission Plan

2013 Transmission System Assessment

2012-2013 Local Area Planning Cycle

Developed For:

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

December 2013

Upper Great Plains Regional Office Transmission System Planning
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Materials contained in the complete study document include Critical Energy Infrastructure Information (CEII). All materials designated as CEII must be handled and protected in accordance with the CEII Policy of Western Area Power Administration (WAPA) and the CEII Policy of any affected Transmission Owner (TO) identified in this document or attached materials.

In order to receive a complete study report, the requesting party will need to follow Western's Critical Energy Infrastructure Information (CEII) Policy. This CEII Policy is included with all Western Area Power Administration Effective Business Practices posted at:

<http://www.oatioasis.com/WAPA/WAPAdocs/Western-Common-Business-Practices.html>

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<http://www.oasis.oati.com/woa/docs/WAPA/WAPAdocs/Western-OATT-BP-CEII-Policy-Version-2010-0812.pdf>

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<http://www.oasis.oati.com/woa/docs/WAPA/WAPAdocs/Western-OATT-Confidentiality-NDA-Agreement-Form-Version-2010-0812.pdf>

Executive Summary

Western's Upper Great Plains Region (UGPR) Local Transmission Planning Process regularly examines all transmission facilities under Western's Open Access Transmission Tariff (OATT). This planning process, which encompasses facilities in both the Eastern and Western Interconnections, is conducted in accordance with Attachment P (Transmission Planning Process) of the OATT filing. Findings resulting from the planning process are annotated in the Local Transmission Plan (LTP), wherein all system upgrades and related transmission system investments necessary to ensure system reliability given network load and firm transmission commitments over a ten year planning horizon are detailed. Each Transmission Provider within Western's OATT boundary utilizes the LTP for system outlook. As part of the UGPR Local Transmission Planning Process, a sub-regional process is conducted for IS facilities within the Eastern Interconnection only.

The 2012/13 IS Local Transmission Planning Process is conducted on a two-year cycle beginning in 2012. During the first year of the cycle, a steady-state analysis is completed. This is followed in the second year of the cycle by prior outage and stability studies. In 2012, a complete steady-state analysis based on the Midwest Reliability Organization (MRO) 2011-series power system models was reported. Using the 2012 steady-state results as a baseline, a complete steady-state analysis based on the latest MRO 2012-series models was repeated in 2013. This allowed the 2013 study solutions to be validated with the 2012 results. This report documents the steady-state results from the 2013 Assessment.

Western is responsible for the development of the LTP that culminates from the 2012-13 local planning process. Western believes that stakeholder input and study group participation is integral to the development of a strong LTP. To that end, Western closely coordinates planning efforts with stakeholders. This includes a minimum of two comprehensive stakeholder meetings held annually (typically in the spring and fall of each year), along with working group meetings conducted to gather comments, guidance, and assistance throughout the planning process. Each fall, the finalized LTP is presented and incorporated into the Mid-Continent Area Power Pool (MAPP) Regional Plan.

The purpose of this study is to determine if existing and planned facility improvements within the Western, Basin, and Heartland Integrated System (IS) are adequate to meet network load service requirements in the 10 year planning horizon. This is accomplished by evaluating near-term and long-term transmission system conditions and identifying areas of concern where corrective action plans are necessary to meet the requirements outlined by NERC Transmission Planning Standards TPL-001 thru TPL-003, the Integrated System's Reliability Criteria, and/or applicable MRO regional standards.

Summary of Results

Thermal:

The Integrated System met the performance criteria defined for all Category A base case conditions (system intact). All NERC Category B and C contingencies which indicated potential thermal concerns are addressed either by existing operating guides, local operating procedures, or planned and proposed system upgrades that were identified in the 2012 Assessment.

Voltage:

The Integrated System met the performance criteria defined for all Category A base case conditions (system intact). Voltage concerns for single element (NERC Category B) and multi-terminal (NERC Category C) contingencies were identified in this Assessment. For near term conditions, voltage concerns are mitigated by existing operating guides until transmission improvements can be implemented. The planned and proposed system upgrades identified in the 2012 Assessment are sufficient to mitigate all areas of concern identified in the 2013 study.

Conclusion and Schedule:

The IS 2012/13 Local Planning Process began with a steady-state assessment that was completed in December 2012 based upon the 2011 MRO series models. The results of the assessment along with a list of plan and proposed projects included in the IS Local Transmission Plan are documented in [1 – 5]. As outlined in the scope of the IS two-year planning cycle, a 2013 steady state assessment was completed based upon the 2012 MRO series models. The purpose of this assessment is to determine if any changes to the Integrated System's Transmission Plan are required. Based upon the results of the 2013 Assessment it was determined that no changes to the current Transmission Plan are necessary. The current Transmission System Plan Schedule is provided below.

2014

- Sioux Falls 230/115 kV transformer replacement with 200 (250) MVA.
- Garrison 230/115 kV transformer (200 MVA)
- Parallel 345/230 kV 250 MVA transformer added at Belfield (old Leland Olds transformer).
- Logan 115 kV Capacitor 2x15 MVar
- Philip 115 kV Capacitor 2x15 MVar

2015

- 2nd Oahe 230/115 kV transformer
- Spencer 161/69 kV transformers replaced with a single 150 MVA transformer.
- 25 MVar Capacitor at Spencer 161 kV
- RCDC-Rapid City 115 kV

After 2015

- Retire the Fargo 115/69 kV KY3A transformer.
- Replace the Fargo 230/115 kV KV1A and KV2A transformers with ones rated at 200 (250) MVA.
- Replacement of Granite Falls KY2A transformer with 63 MVA.
- Upgrade Logan-SW Minot 115 kV (Reconductor) to 180 MVA or greater

2016

- Judson 345/230 kV substation
- Antelope Valley-Charlie Creek 345 kV
- Charlie Creek-Indian Hills-Judson 345 kV
- Judson-Williston 230 kV

2017

- New Underwood 230/115 kV KV1A replacement with 200 (250) MVA
- Tande 345/230 kV Transformer
- Proposed: Construct 2nd Groton-Ordway 115 kV line and upgrade Groton Substation (reconfiguration)
- Tande 345/230 kV substation
- Judson-Tande 345 kV
- Tande-Neset 230 kV
- Proposed: Gumbo Creek Substation 345/115 kV
- Proposed: Blue Butte Substation 345/115 kV
- Proposed: Indian Hills Substation 345/115 kV
- Proposed: Gumbo Creek-Blue Butte-Indian Hill 345 kV

Table of Contents

1. Introduction	7
2. Study Methodology	8
2.1 Thermal Analysis Study Criteria	9
2.2 Voltage Analysis Study Criteria	10
3. Model Development	11
4. Steady State Analysis Results	12
Thermal Observations.....	12
Voltage Observations.....	21
5. Facility Additions and Improvements	25
6. Conclusion	27
7. References.....	28