US Department of Energy

Western AREA POWER ADMINISTRATION

Upper Great Plains Region
Transmission Planning

Integrated Transmission System

Local Area Transmission Plan

2013 Transmission System Prior Outage Assessment

2012-2013 Local Area Planning Cycle

Developed For:

FERC ORDER 890 and NERC Standard TPL-003

December 2013

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

CRITICAL ENERGY INFRASTRUCTURE INFORMATION NOTICE

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

The direct link to the CEII Policy file is:

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

If the request for CEII can be granted, a Non-Disclosure and Confidentiality Agreement (NDA) will be offered to the requestor. A template of the NDA is also posted in Western's Effective Business Practices Folder. The direct link to the pdf file is:

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. This report documents the 2013 Prior Outage 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 evaluate the reliability of the Western, Basin, and Heartland Integrated System (IS) during prior outage conditions (NERC Standard TPL-003, Table I Category C3). This is accomplished by evaluating near-term and long-term transmission system conditions following Category C3 events within a comprehensive study area. Corrective Action Plans to address all areas of concern are provided in this assessment.

Summary of Results

Thermal and Voltage:

All NERC Category C3 contingencies which indicated potential thermal or voltage concerns can be addressed by operating guides or local operating procedures in the near-term planning horizon. Thermal or voltage issues that first appeared in the five year planning horizon will be monitored and operating guides will be created and/or possible system improvements identified (if necessary) to address these concerns should future studies indicate these system conditions could still occur. Appropriate lead times for conducting studies and implementing the corrective action before these potential issues arise on the system are considered.

Conclusion:

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 – 6]. As outlined in the scope of the IS two-year planning cycle, a 2013 prior outage assessment was completed based upon the 2012 MRO series models. The purpose of this assessment is to identify areas of concern under prior outage conditions and determine corrective action plans to ensure system reliability is maintained should such conditions occur on the system.

Table of Contents

1. Introduction 6
2. Study Methodology 7
2.1 Thermal Analysis Study Criteria 9
2.2 Voltage Analysis Study Criteria 10
3. Model Development 11
4. Prior Outage Analysis Results 12
Thermal Observations 12
Voltage Observations 14
5. Conclusion 17
6. References 18