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NorthWestern Energy

Mountain States Transmission Intertie ("MSTI")

Phase 1 Comprehensive Progress Report

December 31, 2007

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Executive Summary

NorthWestern Energy ("NWE") plans to a build 500 kV transmission line approximately 460 miles long. The line, called the Mountain States Transmission Intertie ("MSTI"), will be built between Townsend, MT, and Midpoint substation in southern Idaho. MSTI will be a series compensated transmission line, with a phase shifting transformer ("PST") to control power flow.

The northern terminus of MSTI will be a new 500 kV substation called Townsend. It will tap two existing 500 kV transmission lines between the Broadview substation, and the Garrison substation. The southern terminus of MSTI will be Midpoint—an existing 500 kV substation in southern Idaho. A substation for the PST will be built at or near the existing Mill Creek substation, in southwest Montana. Series capacitors will be located at Midpoint substation, and Mill Creek substation. (See Figure 1.)

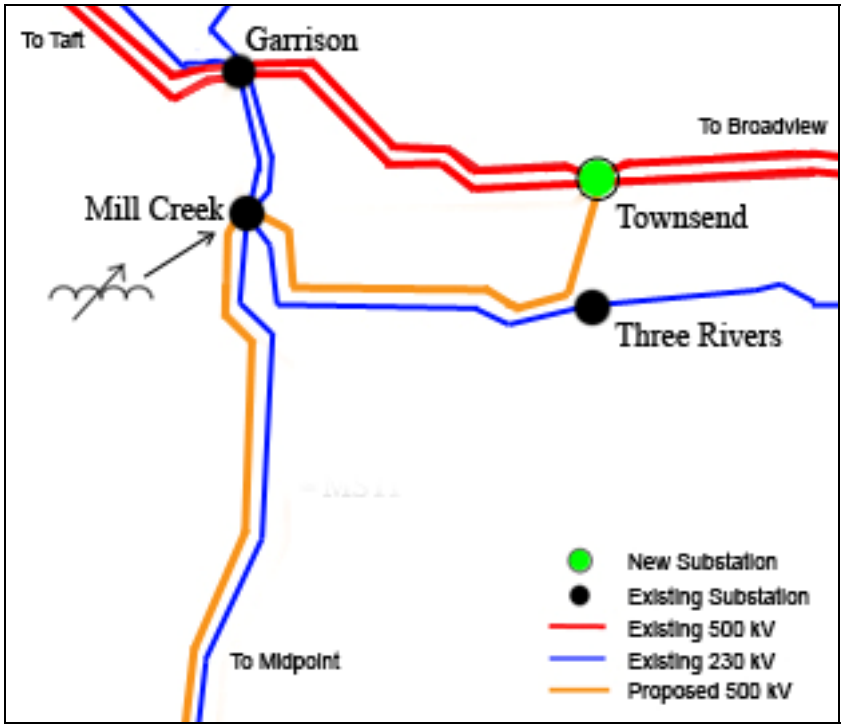

Figure 1. MSTI 500 kV

MSTI will be built to meet transmission service requests from customers, and to relieve constraints on the regions' existing transmission system. In addition, MSTI will accomplish the following:

- Improve transmission system reliability,
- Meet the growing demand for electricity,
- Provide regional energy diversification, and
- Develop a positive economic impact for the area.

This study was completed while following all regional planning guidelines and requirements. The study also meets all applicable NERC and WECC standards. MSTI has a planned in-service date of 2013.

NWE has proposed a planned north to south ("N-S") rating of 1,500 MW on MSTI. Power-flow and angle stability studies show that a 1,500 MW N-S rating is possible during a heavy load condition. The N-S rating can be achieved by re-dispatching generation in Montana to export an additional 1500 MW, while increasing imports in California, Nevada, and Utah.

A south to north ("S-N") planned rating of 950 MW can also be achieved on MSTI. This rating can be accomplished during light load conditions by decreasing exports in Montana and the Northwest, while increasing generation in Utah and Wyoming.

This report concludes Phase 1 of the Project Rating Review Process. NWE plans to initiate Phase 2 on March 1, 2008.

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Introduction

Transmission Need:

The purpose of the MSTI 500 kV project is to accommodate requests for transmission service from customers and to relieve constraints on the regions' existing high voltage transmission system. The need for electricity in the western United States has increased substantially since the end of the last major transmission investment cycle in the 1980's. Since then, population increases driven by economic growth in the West have increased the energy demand of this area.

NWE conducted an Open Season study in December 2004. This study identified potential interest in the use of the Montana to Idaho Path. At present, NWE has received Transmission Service Requests for a portion of the 1,500 MW proposed transmission rating. Between existing Transmission Service Requests and new proposed generation plants, a project to increase export capacity is important for NorthWestern Energy.

Regional and Sub-Regional Participation:

In an effort to address WECC guidelines, NWE participates in the Northern Tier Transmission Group ("NTTG") Fast Track process. Through the Fast Track process, MSTI is coordinated with other regional and sub-regional projects. This helps ensure that MSTI:

- Takes multiple project needs and plans into account,
- Cooperates with other projects to identify broader regional needs,
- Takes planned resources of the region into account,
- Seeks input from stakeholders, and
- Coordinates with potentially parallel or competing projects.

Fulfillment of Need:

This study demonstrates that the proposed MSTI 500 kV project meets all NERC and WECC Planning Standards. The Phase 1 study effort shows that MSTI fulfills the need for new transmission, and reduces existing system constraints.

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Project Description

MSTI will form a 500 kV connection between southwest Montana and southern Idaho. The northern interconnection point will tap two existing 500 kV transmission lines near Townsend, MT. The southern interconnection point will be at the Midpoint 500 kV substation. An additional substation will also be built near the existing Mill Creek substation. The new Mill Creek 500 kV substation will be built to accommodate a phase shifting transformer and series capacitors.

MSTI has a proposed N-S rating of 1,500 MW. Power-flow and angle stability studies show that a 1,500 MW N-S rating is possible during a heavy load condition. The N-S rating can be achieved by re-dispatching generation in Montana to export an additional 1500 MW, while increasing imports in California, Nevada, and Utah.

MSTI has a proposed S-N rating of 950 MW. This rating can be accomplished during light load conditions by decreasing exports in Montana and the Northwest, while increasing generation in Utah and Wyoming.

The electrical components of MSTI are outlined in Table I.

TABLE I.

Electrical Item	Rating	Voltage (kV)	Location
Phase Shifting Transformer	1600 MVA	500	Mill Creek Substation
230/500 kV Autotransformer	500 MVA	500	Mill Creek Substation
Series Capacitor Bank	2000 Amps	500	Mill Creek Substation
Series Capacitor Bank	2000 Amps	500	Midpoint Substation

The following items are illustrated in Figure 2.:

- Proposed path for MSTI.
- Existing high voltage transmission system.
- Paths adjacent to MSTI
- NWE's control area.
- Location of PST.

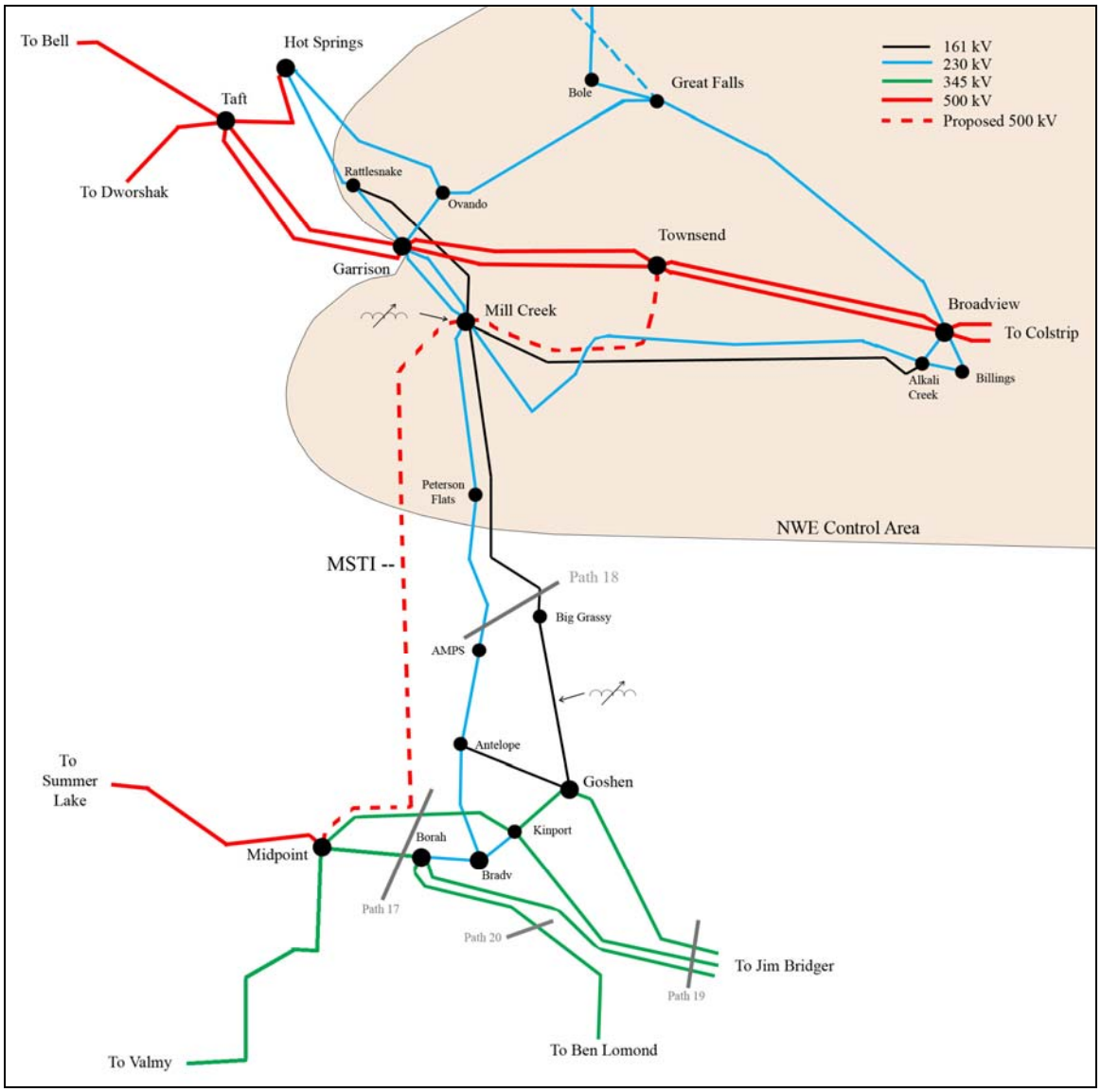

Figure 2. MSTI One-Line Diagram

Project Milestones and Timeline

MSTI Milestones:

- WECC RPP Phase 1—Start: March 1, 2007; Complete: December 31, 2007
- WECC RPP Phase 2—Start: March 1, 2008; Complete: March 1, 2009
- WECC RPP Phase 3—Start: May 1, 2009; Complete: December 31, 2012
- MFSA Application—Start: January 1, 2007; Complete: December 31, 2008
- NEPA/MEPA Scoping—Start: January 1, 2007; Complete: December 31, 2008
- EIS—Start: January 1, 2009; Complete: December 31, 2009
- ROD/ROW Grants—Start: June 1, 2009; Complete: June 1, 2010
- ROW Acquisitions—Start: January 1, 2009; Complete: December 31, 2010
- Project Engineering—Start: January 1, 2007; Complete: December 31, 2010
- Project Construction—Start: January 1, 2010; Complete: December 31, 2012
- In Service Date: January 1, 2013

Figure 3 shows a timeline for the study process.

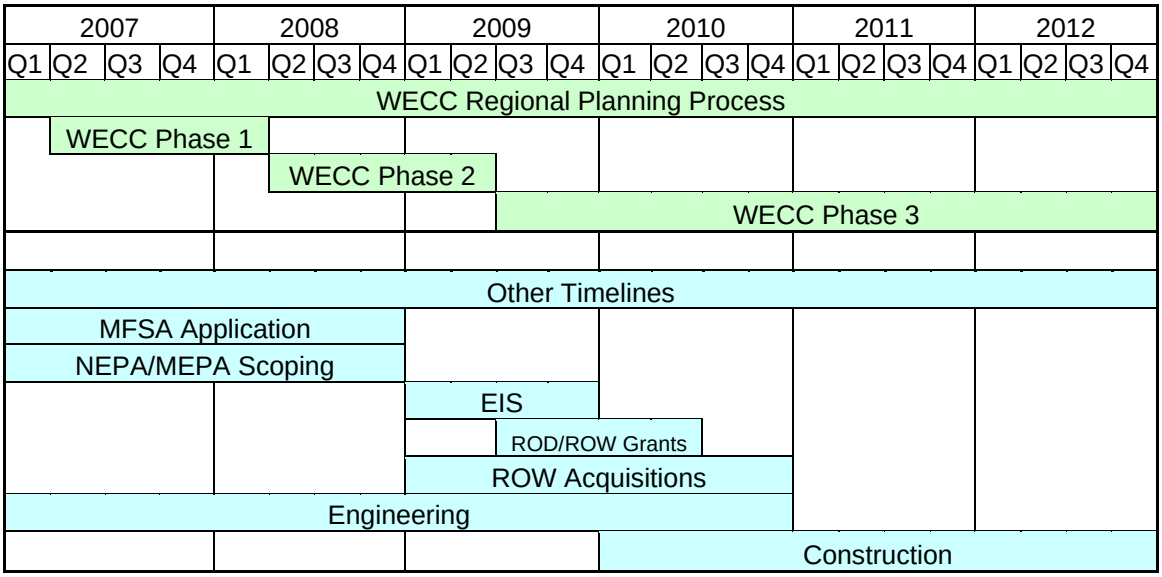

Figure 3. MSTI Timeline

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Study Assumptions

Base Case Descriptions:

This study uses four base cases in various configurations:

- WECC 2015 Heavy Summer, with all NTTG Fast Track projects
- WECC 2015 Heavy Summer, with only MSTI
- WECC 2010 Light Autumn, with all NTTG Fast Track projects
- WECC 2010 Light Autumn, with only MSTI

These four base cases provide a broad range of scenarios for this study. Both heavy load and light load scenarios are studied with and without other NTTG Fast Track projects; this helps meet regional WECC planning guidelines. It also helps determine the impact that MSTI has on the existing system as well as the impact on any future projects. The NTTG projects include the following:

- Gateway South # 1
- Gateway South # 2
- Idaho to the Northwest
- Southwest Intertie Project ("SWIP")
- Transwest Express

Expected Operating Conditions:

The N-S proposed rating of 1,500 MW was determined using the 2015 Heavy Summer case. In order to achieve 1,500 MW of flow on MSTI, generation was re-dispatched in Montana, Arizona, Utah, and California. Generation in Montana was increased by 1,500 MW and decreased by 500 MW each in Arizona, Utah, and California. In order to justify the increased Montana exports, planned resources in NWE's queue were included in the base-cases.

When studying S-N flow, the 2010 Light Autumn base-case was used to determine the rating of 950 MW. Generation was decreased in Montana and the northwest by 1000 MW, and increased by 1000 MW in Idaho and Wyoming. The limiting element in this scenario was the angle range on the PST.

In both the N-S and S-N rating, the power flow could be achieved with and without the proposed NTTG Fast Track projects.

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Study Methodology/Guidelines

Study Criteria used.

1. This study follows NWE's planning criteria, which can be found in Appendix 7. All ratings described in the study are Non-emergency ratings.

Study Methodology

1. Power-flow contingency analysis:
    a. PSS/E's ACCC function was used to analyze single element contingencies (i.e. N-1). ACCC was set up to analyze post transient power flow for any single element outage in MSTI's surrounding area whose voltage level was 230 kV or higher. A detailed list of N-1 is included in Appendix 3.
    b. ACCC was also used to analyze post transient power-flow for double element contingencies (i.e. N-2). A list of N-2 outages is included in Appendix 3.
    c. A detailed study of the effects on existing Remedial Action Schemes ("RAS") will be performed in the Phase 2 study.
2. Post-transient and reactive margin analysis (TO-DO)
    a. Describe load-ability tests (105%)
3. Transient stability analysis. (TO-DO)
    a. Describe limited scope using worst-case conditions. The worst-case scenario will likely be the "MSTI only" case with no NTTG Fast Track projects modeled.
    b. Describe RAS requirements and changes

Criteria Compliance

1. A representative list of power flow and stability cases run that demonstrate compliance with NERC/WECC Planning Standards and WECC Reliability Criteria. (TO-DO)

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Study Results and Conclusion

Planned Rating

This study proposes a planned N-S rating of 1,500 MW and a S-N rating of 950 MW. No negative impacts were identified. NERC/WECC Planning Standards were followed. WECC reliability criteria were met. This project will not require an accepted transmission path rating.

Potential Impacts

Non-Simultaneous impacts: None identified in phase 1.

Simultaneous impacts: Possible simultaneous path interactions will be studied in Phase 2. The paths that may be interact with MSTI include:

- Path 8 (Montana to Northwest),
- Path 17 (Borah West),
- Path 18 (Montana-Idaho),
- Path 19 (Bridger West), and
- Path 20 (Path C).

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Appendix 1: Contact Information

Appendix 2: Basecase Powerflow Plots

Appendix 3: Powerflow Contingency Results

Appendix 4: Post-Transient Powerflow and Reactive Margin Results

Appendix 5: Transient Stability Results/Plots

Appendix 6: Public Process

Appendix 7: NWMT planning Criteria