

Mountain States Transmission Intertie (MSTI)
Townsend – Idaho 500 kV Transmission Project

Study Plan for
SouthBound Phase I
of the
Three-Phase WECC Rating Process

Final Draft
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Northwestern Energy Electric Transmission Planning Group

In conjunction with the
Northern Tier Transmission Group
Sub-Regional Planning Process

Phase 1 of the WECC three-phase Rating Process starts when the project sponsor notifies WECC/PCC/TSS of the project and project is included in the “Existing Generation and Significant Additions and Changes to System Facilities” report. Phase 1 is the period when the sponsor conducts sufficient studies to demonstrate the proposed non-simultaneous rating and prepares a Comprehensive Progress Report (“CPR”) documenting results and describing project details including a preliminary plan of service. Known simultaneous relationships should be noted in the CPR. The outcome of Phase 1 is a Planned Rating. The Planning Coordination Committee (PCC) must find the project conforms to the Regional Planning Guidelines. No commercial interests are addressed in Phase 1 (such as capacity allocation). The Phase 1 study often overlaps the regional and sub-regional planning processes (e.g. NTTG). Other projects are not obligated to recognize projects in Phase 1.

Phase 1 Study Outline

1. Project Definition
 - a. Northwestern Energy (NWMET) plans to serve load and generation customers with the Mountain States Transmission Intertie (MSTI) project. The MSTI project is a single 500 kV line from a proposed new substation at Townsend, Montana to the existing Midpoint substation near Twin Falls, Idaho. The line will have a phase-shifter at the Townsend end and will be series compensated. An intermediate substation mid-way is anticipated, for additional series compensation but no decision has been made on the substation or its location at this time.
 - b. NWMET expects this Phase 1 process will arrive at a Planned Rating of 1500 MW southbound. NWMET does not expect this project to require any

changes to the Accepted Ratings of Path 8, Path 18, or any other paths in the region. NWMT will make every effort during Phase 1 to identify (either intuitively or with studies) any simultaneous issues to deal with in Phase 2.

- c. The 2015 HS case will be used to establish the Planned rating of 1500 MW southbound for MSTI. The 2010 LA case will be used as-needed for scenario analysis.
 - d. Phase 1 is complete upon issuance of the CPR and recognition by the TSS chair that the issues brought up either during Phase 1 or during the 60 day period following Phase 1 have been resolved or will be adequately dealt with in Phase 2.
2. Phase 1 Study plan
- a. NWMT will study the MSTI project with:
 - i. Sufficient technical detail to prove the project meets WECC performance criteria to arrive at a non-simultaneous planned rating. The MSTI Phase 1 study will include the following:
 - 1. Verification that Path 8 and Path 18 perform as expected in the 2015 HS and 2010 LA base cases.
 - 2. Initial examination of southbound performance of MSTI without the NTTG Fast Track projects at the southern terminus of MSTI using the 2015 HS case.
 - a. Generation at the sending end will be non-specific and based on the queues of NWMT and other regional entities.
 - b. Generation in Arizona and California will be reduced to accommodate the MSTI flows (with appropriate Area Interchange Adjustments).
 - 3. Further examination of MSTI performance with Fast Track NTTG projects and non-NTTG regional projects in Phase 2 or later using the 2015 HS case. Table 1 describes the change case (i.e. with MSTI) specifications. NTTG Fast Track projects include:
 - a. Wyoming to Idaho to PNW (aka Gateway west)
 - b. Wyoming to Utah to DSW (aka Gateway south)
 - c. Idaho to Southern Nevada
 - 4. NWMT will not do a special simultaneous interactions study. Rather, known or anticipated simultaneous issues will be reported and brought forward to Phase 2 whether witnessed in Phase 1 or anticipated.
 - 5. Exploratory examination of northbound capacity (2010 LA with MT resources off-line and possible MP-SL OOS) will be made.
 - 6. The above study work will include:
 - a. Outages listed in Table 3
 - b. Three-phase faults only (doubles can use non-3 phase if they fail to perform on the 3-phase fault)
 - c. Proper RAS and/or OMS modeling (recognizing the ATR may change)

- d. Powerflow studies to identify
 - i. Thermal overload issues
 - ii. Static and Dynamic VAR requirements using PV/QV analysis
 - e. Dynamic studies to identify needs for
 - i. Remedial Action Schemes
 - ii. Dynamic voltage control
 - ii. Sufficient review group involvement to assure all relevant Phase 1 issues are dealt with. In order to have a successful peer review group,
 - 1. NWMT will establish a MSTI Project Review Group (“MPRG”).
 - 2. NWMT will solicit input from MPRG for both Table 1 (change case descriptions) and Table 3 (outages to be examined).
 - 3. NWMT will meet with the MPRG as technical study results are available or when there are significant changes in the project but no less than monthly.
 - iii. Sufficient focus to get a proposed rating and develop a preliminary plan of service.
 - 1. Adherence to WECC Phase 1 guidelines and requirements
 - 2. Recognition that the Planned and Accepted ratings can be developed with less-than-final equipment design specifications and system parameters. This recognition is important because there is study work that will parallel the three-phase rating process that is not complete and will take many months to finalize. These studies include:
 - a. Final conductor bundle and tower design to develop the final line constants
 - b. EMTP studies for line shunt reactor and single-pole switching requirements.
 - c. Sub-synchronous resonance studies that may affect the series compensation details.
- 3. Upon completion of Phase 1
 - a. NWMT expects to the transition from Phase 1 to Phase 2 upon notification by the TSS chair of the completion of the following:
 - i. PCC has completed an assessment of the project’s conformity to the regional planning guidelines.
 - ii. NWMT has submitted data to fully represent the project in the WECC base cases
 - iii. NWMT has distributed the CPR to TSS and PCC with a letter requesting Phase 2 status.
 - iv. The 60-day dispute resolution period has expired and the TSS chair grants the project Phase 2 status. At this point the Planned rating will have been established.

Table 1: Change Cases for Planned Rating (based on the 2015 HS base case)

Change case	MSTI Flow	Path 8 Flow	Path 18 Flow	MATL Flow	COI Flow	MT Gen/Ld	WA, Ore & BC Gen/Ld	ID & UT Gen/Ld
No NTTG	1500 SB	Hvy WB	Hvy SB	As Needed	Hvy SB	HI/BC	BC	BC (redispatch as needed with IPC assistance)
All NTTG	1500 SB	Hvy WB	Hvy SB	As needed	Hvy SB	HI/BC	BC	BC (redispatch as needed with IPC assistance)
All NTTG	~500 NB					LO/HI		
NOTE: California and Arizona redispatch will be used to move MSTI power south								

Table 2: Change Case Specifications to identify Simultaneous interactions
WestBound, NorthBound, SouthBound, EastBound

Suspect Simultaneous Interaction To Examine	MSTI Flow	Path 8 Flow	Path 18 Flow	MATL Flow	COI Flow	MT Gen/Ld	WA, Ore & BC Gen/Ld	ID & UT Gen/Ld
Path 8 (use 2010 LA)	1500 SB	Hvy WB	Hvy SB	Hvy NB	Lite SB	Hi/Lo	Lo/Hi	Lo/Hi
Path 18 (use HS 2015 case)	1500 SB	Lite WB	Hvy SB	?	Hvy SB	Hi/Lo	Hi/Lo	Lo/Hi
MATL	1500 SB	Hvy EB	Hvy SB	Hvy NB	Hvy SB	Hi/Lo	Hi/Lo	Lo/Hi
Pairs: P8 + MATL								

Table 3 Outages of interest on each change case

Change Case ID	Outage	Outage	Outage	Outage
No NTTG	MP-SL	List of path 18 outage	Bridger outages	West of Borah
All NTTG				
Test P8	West of Hatwai outages	30-40 outage list by Chuck		
Test P18				