



REAL-TIME MONITORING DATA SPECIFICATION

Version 1

December 9, 2016

Revision History

Version	Date	Reviewer	Revisions
1	11/1/16	Mansion Hudson	Initial document

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1. Document Review

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Director, System Operations

Approval Date

Implementation Date

2. Definitions

Applicable Entity – An entity registered as a Transmission Owner, Transmission Operator, Generator Owner, Generator Operator, Load-Serving Entity, and/or Distribution Provider that owns/operates Transmission equipment within or interconnected with TNMP’s Transmission Operator Area.

Balancing Authority – The responsible entity that integrates resource plans ahead of time, maintains load-interchange-generation balance within a Balancing Authority Area, and supports Interconnection frequency in real time.

Balancing Authority Area – See the *Glossary of Terms Used in NERC Reliability Standards*.

Control Center – A facility hosting operating personnel that monitor and control the Transmission system.

Distribution Provider – Provides and operates the “wires” between the transmission system and the end-use customer. For those end-use customers who are served at transmission voltages, the Transmission Owner also serves as the Distribution Provider. Thus, the Distribution Provider is not defined by a specific voltage, but rather as performing the distribution function at any voltage.

Facility – See the *Glossary of Terms Used in NERC Reliability Standards*.

Generation Operator – The entity that operates generating Facility(ies) and performs the functions of supplying energy and Interconnected Operations Services.

Generation Owner – Entity that owns and maintains generating Facility(ies).

Interconnected Operations Services – See the *Glossary of Terms Used in NERC Reliability Standards*.

Interconnection – See the *Glossary of Terms Used in NERC Reliability Standards*.

Load-Serving Entity – Secures energy and Transmission Service (and related Interconnected Operations Services) to serve the electrical demand and energy requirements of its end-use customers.

Point of Interconnection – Includes the following: (1) Transmission equipment that interconnects Transmission facilities owned/operated by other Transmission Owners and Transmission Operators with TNMP’s Transmission Operator Area, (2) Transmission equipment that interconnects generating Facilities with TNMP’s Transmission Operator Area, (3) Transmission equipment that interconnects Transmission facilities owned by Load-Serving Entities with TNMP’s Transmission Operator Area, (4) Transmission equipment used to interconnect radial Transmission facilities and associated radial distribution facilities owned by Distribution Providers within TNMP’s Transmission Operator Area, and (5) Distribution equipment that is used to serve radial distribution facilities owned by other Distribution Providers from radial distribution facilities owned by TNMP.

Protection System – See the *Glossary of Terms Used in NERC Reliability Standards*.

System Operator – An individual at a Control Center who operates or directs the operation of the Transmission system in Real-time.

Telemetry – Measureable electrical quantities that are transmitted from substations and generating stations to a Control Center.

Transmission – An interconnected group of lines and associated equipment for the movement or transfer of electric energy between points of supply and points at which it is transformed for delivery to customers or is delivered to other electric systems.

Transmission Operator – The entity responsible for the reliability of its “local” transmission system, and that operates or directs the operations of the transmission Facilities.

Transmission Operator Area – The collection of Transmission assets over which the Transmission Operator is responsible for operating.

Transmission Owner – The entity that owns and maintains transmission Facilities.

Transmission Service – See the *Glossary of Terms Used in NERC Reliability Standards*.

3. Acronyms

BA	Balancing Authority
DP	Distribution Provider
ERCOT	Electric Reliability Council of Texas
GO	Generation Owner
GOP	Generation Operator
ICCP	Inter-Control Center Communications Protocol
KV	Kilovolt
LSE	Load-Serving Entity
MVA	Megavolt Ampere
MVAR	Mega Volt-Amperes reactive
MW	Megawatt
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition
SOC	System Operations Center
TCP/IP	Transmission Control Protocol/Internet Protocol

TNMP	Texas-New Mexico Power Company
TO	Transmission Owner
TOP	Transmission Operator
WAN	Wide Area Network

4. Intent

The intent of this document is to outline data required from Applicable Entities for TNMP to perform Real-time monitoring of its Transmission Operator Area.

5. Overview

Real-time monitoring is critical in maintaining situational awareness for System Operators so that they can respond appropriately to system events by rapidly assessing the state of TNMP's Transmission Operator Area. Monitoring refers to System Operators viewing Telemetry in a manner that allows them to determine the state of TNMP's Transmission Operator Area in Real-time and to take corrective and preventative actions as necessary. The general types of data that constitute Telemetry and which are referred to within this requirement document are:

1. Real-time analog values that are scanned from field devices
2. Real-time analog values that are calculated from scanned values
3. Real-time status values that are scanned from field devices

Additionally, acquisition of Telemetry status and analog measurements of the Transmission system together with accurate topology of the Transmission system are required for TNMP to meet its obligation for providing ERCOT the data it needs to perform its operational planning analyses, Real-time monitoring, and Real-time assessments.

6. General Requirements

- 6.1. Data communications shall be established between each Point of Interconnection and TNMP's Control Centers in accordance with the *TNMP Facility Interconnection Requirements, Section C.2.4 "Metering and Telecommunications"*. An RTU assignment shall be compiled by TNMP.
- 6.2. ICCC linkage from ERCOT to TNMP may be considered in lieu of the data communications requirements described in Section 6.1 provided that all required data is available for import from the ERCOT Operations Model. ERCOT has implemented a TCP/IP based WAN that supports the ICCC transfer of data between ERCOT and all ERCOT market participants.
- 6.3. Data transmission using the ICCC link must be formatted and coordinated according to the *ERCOT NODAL ICCC Communication Handbook* and shall satisfy the requirements of the *ERCOT Nodal Protocols and Telemetry Standards*.
- 6.4. A project specific RTU points list or ICCC points list will be developed by TNMP consisting of the Telemetry quantities set forth in Sections 7, 8, 9, 10, and 11.

- 6.5. Prior to placing a new Transmission or distribution facility in service, including a new Point of Interconnection, the required Telemetry data points shall be fully operational and verified in accordance with TNMP's *Network Model and SCADA Maintenance Process*, Section 9 "SCADA Checkout Process".

7. Data Requirements Applicable to TNMP as a Transmission Owner

TNMP Transmission Operator Area¹ Telemetry shall include the following quantities:

- 7.1. Status of all breakers
- 7.2. Instantaneous three-phase voltage magnitudes from a minimum of one measurement point on the station bus for each operating voltage of each station.
- 7.3. For transmission transformers
 - 7.3.1. Instantaneous MW at each terminal
 - 7.3.2. Instantaneous MVAR at each terminal
 - 7.3.3. Instantaneous MVA at each terminal – can be calculated using corresponding MW and MVAR Telemetry
 - 7.3.4. Load tap changer position
- 7.4. For non-radial lines
 - 7.4.1. Instantaneous MW at each line terminal
 - 7.4.2. Instantaneous MVAR at each line terminal
 - 7.4.3. Instantaneous MVA at each line terminal – can be calculated using corresponding MW and MVAR Telemetry
- 7.5. For radial lines
 - 7.5.1. Instantaneous MW at the source terminal
 - 7.5.2. Instantaneous MVAR at the source terminal
 - 7.5.3. Instantaneous MVA at the source terminal – can be calculated using corresponding MW and MVAR Telemetry
- 7.6. For Protection Systems
 - 7.6.1. Status of line protection primary and backup relays
 - 7.6.2. Status of line protection communication as applicable
 - 7.6.3. Status of transformer protection primary and backup relays
 - 7.6.4. Status of bus protection primary and backup relays
- 7.7. For Special Protection Systems – In accordance the ERCOT document *PROCEDURE FOR APPROVAL AND DISTRIBUTION OF REMEDIAL ACTION PLANS (RAP), MITIGATION PLANS (MP), AND SPECIAL PROTECTION SYSTEMS (SPS)*, the following quantities shall be provided for each Special Protection System:

¹ Includes all BES Facilities and new installations of Non-BES Transmission facilities.

7.7.1. Arm status

7.7.2. Operation status

8. Data Requirements Applicable to Other Transmission Owners and Transmission Operators

Telemetry shall include the following quantities for each Transmission to Transmission Point of Interconnection²:

- 8.1. Status of all Interconnecting Entity-owned breakers adjacent to the Point of Interconnection
- 8.2. Instantaneous MW through the Point of Interconnection
- 8.3. Instantaneous MVAR through the Point of Interconnection
- 8.4. Instantaneous MVA through the Point of Interconnection - can be calculated using corresponding MW and MVAR Telemetry

9. Data Requirements Applicable to Generator Owners and Generator Operators

Telemetry shall include the following quantities for each Transmission to generation facility Point of Interconnection:

- 9.1. Status of all Generator Owner/Generator Operator breakers adjacent to the Point of Interconnection
- 9.2. Instantaneous MW through the Point of Interconnection
- 9.3. Instantaneous MVAR through the Point of Interconnection
- 9.4. Instantaneous MVA through the Point of Interconnection - can be calculated using corresponding MW and MVAR Telemetry
- 9.5. Instantaneous three phase voltage magnitudes on the Generator Owner/Generator Operator side of the Point of Interconnection

Telemetry shall also include the following quantities for each conventional (synchronous) generation plant interconnected with the TNMP Transmission Operator Area:

- 9.6. Status of all generator breakers
- 9.7. Status of all generator step-up and auxiliary transformer high side breakers
- 9.8. Status of all generator step-up and auxiliary transformer switches
- 9.9. Status of all circuit switchers and line switches
- 9.10. Status of all bus tie breakers
- 9.11. Instantaneous MW for each generation unit.
- 9.12. Instantaneous MVAR for each generation unit.
- 9.13. Generator station use MW for each auxiliary transformer.
- 9.14. Generator station use MVAR for each auxiliary transformer.

² Includes all BES Facilities and Non-BES Transmission facilities

9.15. Station Frequency

10. Data Requirements Applicable to Load-Serving Entities

Telemetry shall include the following quantities for each Point of Interconnection with an LSE:

- 10.1. Status of all Interconnecting Entity-owned breakers adjacent to the Point of Interconnection
- 10.2. Instantaneous MW through the Point of Interconnection
- 10.3. Instantaneous MVAR through the Point of Interconnection
- 10.4. Instantaneous MVA through the Point of Interconnection - can be calculated using corresponding MW and MVAR Telemetry
- 10.5. Instantaneous three phase voltage magnitudes on the Distribution Provider side of the Point of Interconnection³

11. Data Requirements Applicable to Distribution Providers⁴

Telemetry shall include the following quantities for each Point of Interconnection serving distribution facilities:

- 11.1. Status of all Transmission breakers adjacent to the point of interconnection
- 11.2. Instantaneous MW through the Point of Interconnection
- 11.3. Instantaneous MVAR through the Point of Interconnection
- 11.4. Instantaneous MVA through the Point of Interconnection - can be calculated using corresponding MW and MVAR Telemetry
- 11.5. Instantaneous three phase voltage magnitudes on the Distribution Provider side of the Point of Interconnection⁵

12. Data Provision Periodicity

TNMP's SCADA sampling rates are one sample every four seconds for status points and one sample every ten seconds for analog points.

13. Data Provision Requirements

- 13.1. A list of project specific telemetered data points and all technical modeling information from an Applicable Entity for facility addition, revision, or deletion to be included in any ERCOT Network Operations Model update must be submitted to TNMP SOC in accordance with the NOMCR process defined in the ERCOT Protocols, Section 3.3, a minimum of 100 days prior to establishing an interconnection.

³ As deemed necessary by TNMP.

⁴ Includes TNMP as a Distribution Provider

⁵ As deemed necessary by TNMP. Generally does not apply to distribution-to-distribution Points of Interconnection.

- 13.2. A list of project specific telemetered data points to be delivered via ICCP must be defined by the Applicable Entity in accordance with the *ERCOT Nodal ICCP Communication Handbook*, Sections 5 and 6, and submitted to TNMP SOC a minimum of 100 days prior to establishing interconnection.
- 13.3. Changes to existing ICCP data import names must be communicated to TNMP SOC 10 days prior to scheduled ERCOT Model loads to prevent data loss.

14. Metered and ICCP Telemetry Performance Criteria

- 14.1. The Applicable Entity is responsible for providing required telemetered or ICCP data to TNMP in accordance with the standards for continuous and reliable telemetry as defined in the *ERCOT Telemetry Standards*.
- 14.2. For loss of telemetry, ICCP data, or connectivity the Applicable Entity shall notify TNMP SOC within 15 minutes of detection of the failure⁶. Contact information for TNMP SOC is provided in Appendix A.
- 14.3. Lost data or signals, whether failed or in error, must be restored promptly by the provider of the telemetered data. TNMP SOC will inform the Applicable Entity if a data item is essential and needs to be repaired as quickly as possible.
- 14.4. When TNMP SOC notifies a data provider of Telemetry that is inconsistent with surrounding measurements, the provider shall, within 30 days, either a) calibrate/repair the suspect equipment, b) coordinate a telemetry outage to schedule calibration/repair of the suspect equipment, or c) provide TNMP SOC with engineering analysis proving the data element is providing accuracy within its specifications.
- 14.5. It is the responsibility of the Applicable Entity to insure that calibration, testing and other routine maintenance of equipment is done on a timely basis. Coordination of telemetry outages required for these activities is also the responsibility of the Applicable Entity. If the Applicable Entity's data repeatedly fails, TNMP SOC may require additional measures be taken to either supplement or replace the required data.
- 14.6. Telemetered data received from an Applicable Entity must be current and free from ambiguous data values and changes in state. Guidelines for reliable data and telemetry standards are outlined in the *ERCOT Nodal Protocols*, *Telemetry Standards*, and *ERCOT Nodal ICCP Communication Handbook*.

⁶ Pursuant to NERC Reliability Standard TOP-001-3, TNMP as a registered Transmission Operator is required to notify ERCOT as its registered Reliability Coordinator and known impacted interconnected entities of unplanned outages of 30 minutes or more for telemetering and control equipment, monitoring capabilities, and associated communications channels.

15. Appendix A

TNMP System Operations Contacts

Name	Title	Office Phone	Mobile Phone
SOC	Transmission System Operator	281-581-4700 Opt. 1	480-263-5349 (Sat)
SOC	Distribution System Operator	281-581-4700 Opt. 2	
BSOC	Transmission System Operator	469-702-4800 Opt. 1	480-456-2654 (Sat)
BSOC	Distribution System Operator	469-702-4800 Opt. 2	
Tony Hudson	Director, System Operations	281-581-4712	281-770-0108
Mickey McCann	Manager, Transmission System Operations	281 581-4701	409-370-0953
Rick Agee	Manager-Distribution System Operations	281-581-4702	713-703-1260
Chris Dobard	Manager, SCADA Communications	281-581-4719	281-380-6304
Heidi Mansion	Engineering Systems Coordinator	281-581-4704	409-370-0963
Trevor Tidwell	Engineer IV	281-581-4708	832-425-1174
Michael Dockins	Engineer IV	281-581-4703	832-746-1119

16. Signed Document Review Page

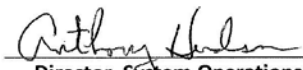
Texas New-Mexico
Power Company

Real-time Monitoring Data Specification v1

External

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