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Scope and Purpose

This document describes the methodology EPE presently uses to rate its BES Facilities and reflects compliance with NERC Reliability Standard FAC-008. The methodology described herein covers Facilities solely and jointly owned by EPE, for which EPE has responsibility for providing ratings. EPE bases its facility rating methodology on industry standards as outlined below. These industry standards have changed over the years with EPE modifying its rating methodology accordingly to keep pace with accepted industry standards and practices. This document describes EPE's current methodology and makes no assumptions as to the design criteria of legacy equipment and facilities.

The Facilities addressed in this document are comprised of various electrical equipment or Elements (defined term by NERC). EPE Facilities may contain one or more Elements in series. For example, a transmission line includes conductors, jumpers, clamps, switches, breakers and may include, line traps. Overcurrent protective relays, if present, will also be included as part of the transmission line Facility. All this equipment or Elements operate together to comprise transmission line Facilities with the limiting Facility ratings being derived from the individual equipment ratings. Thus, the Facility ratings will be limited by the most limiting equipment rating and will not exceed the most limiting MVA rating of any equipment that comprises the Facility.

The scope of equipment or Elements addressed in this document includes the following:

- Transmission Lines
- Transformers
- Series and Shunt Compensation Devices[1]
- HVDC Back to Back Terminal
- Terminal Equipment

Terminal Equipment includes circuit breakers, circuit switchers, disconnect switches, substation conductors, mechanical and/or compression connectors, instrument transformers, line traps, and protective relays.

Transmission Facilities

Transmission Lines

EPE transmission lines are defined as transmission circuits that terminate at substation buses protected by protective relays and circuit breakers with fault interrupting capacity. These lines may serve one or more distribution (load serving) substations or switching stations, or they may import, export or deliver power from external or local resources. The lines between distribution substations and switching stations are termed "transmission line sections or segments."

Transmission line Facilities are rated by three main sets of equipment: substation termination equipment in series with the transmission line, switching station equipment in series with the transmission line, and transmission line conductors. All EPE transmission line conductors are overhead. EPE's transmission system does not include underground transmission cables. The substation terminal equipment includes circuit breakers, circuit switchers, disconnect switches, substation conductors, mechanical and/or compression connectors, instrument transformers, wave traps[1], line traps, and protective relays. Switches and bus work also comprise substation and switching station equipment. Since all this associated transmission line equipment is also used in other Facilities besides transmission lines, the rating methodology for this equipment is shown under a separate section, "Terminal Equipment." Each transmission line may consist of line sections, which may have multiple conductor sizes, types and ampacity ratings. A transmission line or line section is rated based on the most limiting rating of its associated equipment. In some cases, the limiting element for a

[1] EPE has no series reactive devices. EPE's shunt reactive devices are utilized for voltage control only and the loss of such device will not result in the loss of another transmission element. EPE utilizes the manufacturer's nominal rating for these devices. Additionally, EPE has no wave traps.

transmission line may change with various switching arrangements. Where a transmission line is terminated with two breakers in parallel, the line ratings may be reduced when one of the breakers is open and the remaining breaker and bus work has ampacity ratings lower than the line ampacity rating.

Overhead Transmission Line

Overview

The process for determining the thermal limit of an overhead transmission line is described below, where the limiting element of an overhead transmission line is its thermal limitation.

Normal and Emergency Rating Criteria

Normal and Emergency Ratings for ***solely owned*** overhead transmission conductors are determined using the rating methodology described in the document "New Conductor Capacities Base Ratings," dated May 25, 2015 and recently updated using a new wind parameter and wind-to-conductor angle utilizing the industry standard 90° incident angle as explained in the memo "Wind Speed Verification for Conductor Rating Increase" dated January 31, 2019 . The conductor ampacities currently used by EPE were established using the current version of Southwire's SWRate Overhead Conductor Thermal Rating Program using parameters for EPE's local service territory.

Normal Ratings and Emergency Ratings for ***jointly owned*** overhead transmission conductors are determined using the rating methodology described in the document "Analysis of Overhead Conductors," dated April 15, 1977.

Industry Standards

Bare overhead transmission conductor ratings at EPE are consistent with and use the methodology described in the IEEE Standard for Calculating the Current-Temperature Relationship of Bare Overhead Conductors (IEEE Standard 738-2011).

Input Criteria Assumptions

EPE's criteria for its methodology is summarized utilizing the IEEE Standard for Calculating the Current-Temperature Relationship of Bare Overhead Conductors (IEEE Standard 738–2011).

The thermal ampacities used by EPE for rating ***solely owned*** overhead 345kV transmission conductors is based upon the following ambient weather conditions and configurations specific to EPE's service territory:

- Ambient Air Temperature: 40°C (104°F)
- Wind Speed[2]: 3.7 fps (2.5 mph)
- Wind to Conductor Angle: 60°
- Altitude: Highest structure elevation for each particular transmission line
- North Latitude: Highest Structure
- Line Azimuth: 180° (North – South)
- Emissivity: 0.5 (average oxidized conductor)
- Solar Absorption: 0.5 (average oxidized conductor)
- Atmosphere: Clear (sunny day)
- Local Time: 4 p.m.
- Solar Day: June 21
- Frequency: 60 Hz
- Conductor Temperature: 75°C (normal rating) 100°C (4-hour emergency rating) or otherwise sag-limited conductor temperature from the most clearance impaired structure.

The thermal ampacities used by EPE for rating ***solely owned*** overhead 69 kV and 115 kV transmission conductors is based upon the following ambient weather conditions and configurations specific to EPE's service territory:

- Ambient Air Temperature: 40°C (104°F)
- Wind Speed: 4.0 fps (2.73 mph)
- Wind to Conductor Angle: 90°
- Altitude: 3918 feet (El Paso International Airport)
- North Latitude: 31.8°
- Line Azimuth: 180° (North – South)
- Emissivity: 0.5 (average oxidized conductor)
- Solar Absorption: 0.5 (average oxidized conductor)
- Atmosphere: Clear (sunny day)
- Local Time: 4 p.m.
- Solar Day: June 21

[2] Jointly owned transmission lines currently use 1.7 mph (2.5 fps) wind speed in line rating calculations.

- Frequency: 60 Hz
- Conductor Temperature: 75°C (normal rating) 100°C (4-hour emergency rating)

Jointly owned overhead transmission conductors utilize the same assumptions except for the following parameters:

- Wind Speed: 2.5 fps (1.7 mph)
- Wind to Conductor Angle: 90°
- Local Time: 4 p.m.

Summarized in the table below are the normal and emergency conductor operating temperatures of different conductor types for solely and jointly owned overhead lines used by EPE:

ACSR	75°C Normal, 100°C Emergency*
AAC (this conductor is utilized for Substation equipment jumpers)	75°C Normal, 100°C Emergency*
ACSS	Various Continuous Temperatures from 100°C up to 200°C*
Copper Hard Drawn	75°C Normal, 100°C Emergency*

*Additional conditions could exist that would limit the transmission line rating. Lines with sag limitations are sag limited based on minimum clearances determined by field inspections and special engineering software. The minimum clearance of a transmission line determines the maximum conductor operating temperature (MCOT) of the entire transmission line. The MCOT of the sag rated line may or may not be lower than the normal rating of the conductor itself but it will be lower than the emergency rating of the conductor. In this case, the normal rating still applies to the sag rated line but the MCOT determined by the minimum clearance of the line becomes the new emergency rating of the transmission line. If the MCOT is lower than both the normal and emergency ratings of the conductor, then the line will have a continuous rating based on the MCOT due to the minimum clearance found. Accordingly, the new transmission line ratings will be lower than the non-sag rated conductor capacity and associated ratings.

As a matter of practice, EPE also adjusts its conductor ratings in the operating time frame based on real-time or expected temperature and/or wind speed deviations from the above listed values. These real time weather ratings are used in short time studies and emergency operating procedures of the transmission system.

Transformers

Transformer Facilities include Transformers (transformers with the primary terminal and at least one secondary terminal operated at 100kV or higher unless it serves a radial load), GSU transformers, autotransformers, distribution transformers and associated connected equipment. Associated equipment connected to the transformer such as circuit breakers, bus work, switches and protective relays associated with Transformer Facilities are shown under section entitled "Terminal Equipment." The Terminal Equipment are designed above the ratings of the transformer to avoid limiting the capacity and operation of the transformer. Therefore, the transformer ratings become the limiting ratings of the Transformer Facility.

Autotransformers

Transmission system autotransformers on the BES are rated on an individual basis. These ratings are maintained on a list, which include the substation name, the EPE equipment company asset number or location within the substation, the autotransformer nameplate rating in MVA (megavolt-amperes), and the Emergency rating in MVA. The emergency ratings are determined by the following methods:

Application of Standard IEEE C57.91 - 2011, Guide for Loading Mineral-Oil Immersed Power Transformers Rated in Excess of 100 MVA (65° C Winding Rise).

Limitations of the transformer bushings as established and evaluated by the original bushing manufacturer or by the bushing nameplate rating.

Transformer's normal and emergency ratings are determined using IEEE Standard C57.91-2011.

The limiting assumptions under overloads are as follows:

- 15% above highest nameplate rating for 4 hours, 25% above highest name plate rating for 30 minutes. Differences in ratings can be applied on a case-by-case basis.
- Top oil temperature shall not exceed 105°C during the 24-hour period.
- Winding hottest-spot temperature shall not exceed 130℃ during the 24-hour period.
- The maximum ratings in some cases are limited by the ampacity of the transformer bushings.

The rating for any given autotransformer is the nominal thermal capacity of the unit. Please note, however, that the maximum thermal rating of any autotransformer is dependent upon the actual transformer's operating conditions, which include ambient temperature, preloading conditions,

tap setting at the time of the overload and the direction of flow. Additionally, the rating of the tertiary winding of any autotransformer is the manufacturer's nameplate rating.

Phase Shifting Transformer

EPE's PST, designed to control power flow on the WestMesa – Arroyo 345 kV transmission line, and is located at the end of the line at Arroyo Substation. The PST's nameplate normal ONAF rating is 400 MVA at 65°C rise. This rating is calculated to consider an emergency rating of 125% or 500 MVA for 30 minutes. These ratings are based on the assumptions of an ambient temperature of 45°C, up to full load (400 MVA) preloading condition and a 65°C rise.

The rating given for the PST is the nominal thermal capacity of the unit. Please note, however, that the maximum thermal rating of the PST is dependent upon the actual PST operating conditions such as ambient temperature, preloading conditions, tap setting at the time of the overload and the direction of flow.

In addition to the PST thermal ratings detailed above, the PST also has an angular limitation of +/- 34 degrees.

Generator Step-Up Transformers

Transmission GSU's at EPE are specified and rated according to:

- IEEE C57.12.00-2006, Standard for Standard General Requirements for Liquid Immersed Distribution, Power, and Regulating Transformers
- IEEE C57.12.10-2010, Standard Requirements for Liquid Immersed Power Transformers
- IEEE C57.12.90-2006, Standard Test Code for Liquid Immersed Distribution, Power, and Regulating Transformers
- IEEE C57.116-1989, Guide for Transformers Directly Connected to Generators

Transmission GSU's are specific to the generating unit they service and are designed and applied for the full range of normal system loading conditions and ranges to which they will be subjected. The Normal Rating for EPE transmission GSU's is rated per the manufacturer's nameplate. EPE does not have ratings above normal for GSU's therefore no Emergency Ratings are provided, as they would be equal to the Normal Ratings.

Other associated power system equipment connected to the GSU such as breakers, switches, bus work, and relays are designed not to be limiting Elements for the operation of the GSU. Therefore, the GSU ratings become the limiting ratings of the GSU Facility. Additionally, because

capacitors are connected in parallel to other EPE Facilities, these capacitors are not the limiting Element for any other Facility. The rating methodology for these other devices is provided under section, "Terminal Equipment".

Shunt Capacitors

Transmission shunt capacitors at EPE are specified and rated according to:

- IEEE 18, Standard for Shunt Power Capacitors
- IEEE 1036, Guide for the Application of Shunt Power Capacitors
- IEEE C37.99, Guide for the Protection of Shunt Power Capacitors

Transmission shunt capacitors are specified, designed and applied for the full range of normal system voltage conditions and ranges to which they will be subjected. The Normal Rating for EPE transmission shunt capacitors is rated per the manufacturer's nameplate at a nominal 69kV and 115kV. EPE does not have ratings above normal for shunt capacitor banks therefore no Emergency Ratings are provided, as they would be equal to the Normal Ratings.

Other associated power system equipment connected to the bank such as circuit breakers, switches, bus work and relay settings are designed not to be limiting Elements for the operation of the bank. Therefore, the shunt capacitor bank ratings become the limiting ratings of the shunt capacitor bank Facility. The rating methodology for these other devices is provided under section, “Terminal Equipment.”

Shunt Reactors

Shunt reactors in support of the BES are specified and rated according to:

- IEEE C57.21, Standard Requirements, Terminology, and Test Code for Shunt Reactors Rated Over 500 KVA
- IEEE C57.12.00-2006, Standard for Standard General Requirements for Liquid Immersed Distribution, Power, and Regulating Transformers
- IEEE C57.12.10-2010, Standard Requirements for Liquid Immersed Power Transformers
- IEEE C57.12.90-2006, Standard Test Code for Liquid Immersed Distribution, Power, and Regulating Transformers

Shunt reactors in support of the BES System are specified, designed and applied for the full range of system voltage conditions and ranges to which they will be subjected. The Normal

Rating for EPE shunt reactors is rated per the manufacturer's nameplate adjusted to a nominal system voltage of 345kV.

Other associated power system equipment connected to the reactor such as circuit breakers, switches, bus work and relay settings are designed not to be limiting Elements for the operation of the reactor. Therefore, the reactor ratings become the limiting ratings of the Facility. Additionally, because reactors are connected in parallel to other EPE Facilities, these reactors are not the limiting Element for any other Facility. The rating methodology for these other devices is provided under section "Terminal Equipment".

Series Capacitors

EPE does not have any series capacitors on its system and therefore rating methodology is not needed.

High Voltage Direct Current

EPE's HVDC terminal is rated per the manufacturer's specifications and is designed to operate at 200 MW with a 10% overload rating up to 220 MW including a minimum power transfer level of 35 MW in either east to west or west to east directions. The Continuous Rating for the HVDC terminal is given on the manufacturer's nameplate. EPE does not provide ratings above normal for the HVDC terminal therefore no Emergency Rating are provided, as they would be equal to the Continuous Rating.

Other associated power system equipment connected to the HVDC terminal such as breakers, switches, bus work, and relays are designed not to be limiting Elements for the operation of the HVDC terminal. Therefore, the HVDC terminal rating becomes the limiting rating of the HVDC terminal Facility. The rating methodology for these other devices is provided under section "Terminal Equipment."

Terminal Equipment

Substation Conductors

Overview

The process for determining the ampacity of conductors and aluminum bus used in outdoor substations, which are based on single bus conductors in free air.

Input Criteria Assumptions

EPE's criteria for its methodology is summarized utilizing the IEEE Standard for Calculating the Current-Temperature Relationship of Bare Overhead Conductors (IEEE Standard 738).

The thermal ampacities used by EPE for rating substation conductors is based upon the following ambient weather conditions and configurations specific to EPE's service territory:

- Ambient Air Temperature: 40°C (104°F)
- Wind Speed: 4.0 fps (2.73 mph)
- Wind to Conductor Angle: 90°
- Altitude: 3918 feet (El Paso International Airport)
- North Latitude: 31.8°
- Line Azimuth: 180° (North – South)
- Emissivity: 0.5 (average oxidized conductor)
- Solar Absorption: 0.5 (average oxidized conductor)
- Atmosphere: Clear (sunny day)
- Local Time: 4 p.m.
- Solar Day: June 21
- Frequency: 60 Hz
- Conductor Temperature: 115°C (continuous rating)

Continuous Conductor Operating Temperatures:

Summarized in the table below are the normal conductor operating temperatures of different conductor types used at the substations.

ACSR	115°C continuous rating
AAC (this conductor is utilized for Substation equipment jumpers)	115°C continuous rating
ACSS	150°C continuous rating
Copper Hard Drawn	115°C continuous rating

Aluminum and copper rigid bus conductors, including bar, angle, tube, and integral web, are rated with 2.0 fps wind velocity. The rigid bus conductor ratings at EPE are consistent with and use the methodology described in the IEEE Guide for Design of Substation Rigid-Bus Structures, IEEE Std. 605.

ACSR conductors are normally used at EPE substations in high voltage areas and are rated with 4.0 fps wind velocity. The ACSR conductor ratings at EPE are consistent with and use the methodology described in the IEEE Standard for Calculating the Current-Temperature

Relationship of Bare Overhead Conductors, IEEE 738 and the current version of Southwire's SWRate Overhead Conductor Thermal Rating Program.

Bare copper conductors are rated with 4.0 fps wind velocity. Bare copper cable conductor ratings at EPE are consistent with the ratings listed in the Southwire's SWRate Overhead Conductor Thermal Rating Program.

EPE's philosophy is that conductors and connectors should be ampacity rated at or above the switches and equipment to which they are connected. EPE does not have ratings above normal for substation conductors therefore no Emergency Ratings are provided, as they would be equal to the Continuous Ratings.

Circuit Breakers

AC High-Voltage Circuit Breakers are specified by operating voltage, continuous current, interrupting current and operating time in accordance with IEEE Standards C37 series, "Symmetrical Current Basis." These ratings are indicated on the individual Circuit Breaker nameplate. The following standards are referenced in the breaker specifications:

- IEEE C37.04, Standard Rating Structure for AC High-Voltage Circuit Breakers
- IEEE C37.06, Standard for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis - Preferred Ratings and Related Required Capabilities for Voltages Above 1000V
- IEEE C37.09, Standard Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis
- IEEE C37.10, Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis
- IEEE C37.010b, Standard for Emergency Load Current-Carrying Capability
- IEEE C37.010e, Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis (Supplement to IEEE C37.010)

EPE's rates transmission circuit breakers according to the manufacturer's specifications. The Normal Rating for EPE transmission circuit breakers are rated as shown on the manufacturer's nameplate. Nameplate interrupting ratings are adjusted for reclosing of oil circuit breakers per ANSI C37.04, IEEE Standard Rating Structure. EPE does not have ratings above normal for

transmission circuit breakers therefore no Emergency Ratings are provided, as they would be equal to the Continuous Ratings.

Instrument Transformers

Freestanding current (check font) transformers, metering units or voltage transformers, are rated according to:

- IEEE C57.13, Standard Requirements for Instrument Transformers

EPE rates transmission instrument transformers according to the manufacturer's specifications. The Normal Rating for EPE transmission instrument transformers are rated as shown on the manufacturer's nameplate. EPE does not have ratings above normal for transmission instrument transformers therefore no Emergency Ratings are provided, as they would be equal to the Continuous Ratings.

Switches

The following Standards are used to rate High-Voltage switches:

- IEEE C37.30.1, Standard Requirements for AC High-Voltage Air Switches Rated Above 1000 V.

Transmission switches are rated according to the manufacturer's specifications. The Normal Rating for EPE transmission switches is rated as shown on the manufacturer's nameplate. EPE does not have ratings above normal for transmission switches therefore no Emergency Ratings are provided, as they would be equal to the Normal Ratings.

Line Traps

Line traps are rated according to:

- ANSI C93.3, Requirements for Power-line Carrier Line Traps.

Line traps are rated according to the manufacturer's specifications. The Normal Rating for EPE line traps is rated as shown on the manufacturer's nameplate. EPE does not have ratings above normal for line traps therefore no Emergency Ratings are provided, as they would be equal to the Continuous Ratings.

Relay Settings

EPE follows applicable NERC Reliability Standard PRC-023 ensuring EPE means the relay loadability requirements as outlined in Reliability Standard PRC-023. The exception to this would be a radial transmission line where EPE is coordinating with the protection for a device at the end of the line (as backup) or at the request of a customer for coordination purposes.

Information Availability

EPE's current Facility Rating Methodology is available on EPE's internet site http://www.epelectric.com/transmission/documents for review and comment. Additionally, facility ratings are also distributed to Reliability Coordinators, Transmission Operators, Transmission Planners and Planning Coordinators via electronic communication, and the Regional Reliability Organization through power flow cases as requested for operating and planning purposes.

Records Retention

EPE personnel shall retain the facility rating spreadsheet, supporting documentation, and any internal or external correspondence in connection with notifications, requests, and/or responses for the above-related activities for the most current four years or to the previous scheduled on-site audit, whichever is longer. As indicated above the documentation shall include, but is not limited to, spreadsheets, supporting documentation, and any correspondence related to such activities.

Acronyms

AAC – All Aluminum Conductors
ACSS – Aluminum Conductor Steel Reinforced (a.k.a. SSAC – Steel Supported Aluminum Conductor)
ACSR – Aluminum Conductor Steel Reinforced
AEIC – Association of Edison Illuminating Companies
AIEE –Institute of Electrical Engineers
ANSI – American National Standards Institute
BES – Bulk Electric System
EMS – Energy Management System
EPE – El Paso Electric Company
EPRI – Electric Power Research Institute
FACTS – Flexible AC Transmission System
fps – feet per second
GSU – Generator Step-up
HVDC – High Voltage Direct Current

IACS - International Annealed Copper Standard
IEC – International Electrotechnical Commission
IEEE – Institute of Electrical and Electronics Engineers
MCOT – Maximum Conductor Operating Temperature
mph – miles per hour
MVA – Mega Volt Amp
NERC – North American Electric Reliability Corporation
ONAF – Oil natural, air forced PST – Phase Shifting Transformer
PST – Phase Shifting Transformer
TSR – Transmission, Substation & Relay

All capitalized terms, which are not defined within this document, shall carry the meanings set out in the NERC Glossary of Terms.

References

NERC Standard FAC-008-3

R1. Each Generator Owner shall have documentation for determining the Facility Ratings of its solely and jointly owned generator Facility (ies) up to the low side terminals of the main step up transformer if the Generator Owner does not own the main step up transformer and the high side terminals of the main step up transformer if the Generator Owner owns the main step up transformer.

1.1 The documentation shall contain assumptions used to rate the generator and at least one of the following:

- Design or construction information such as design criteria, ratings provided by equipment manufacturers, equipment drawings and/or specifications, engineering analyses, method(s) consistent with industry standards (e.g. ANSI and IEEE), or an established engineering practice that has been verified by testing or engineering analysis.

- Operational information such as commissioning test results, performance testing or historical performance records, any of which may be supplemented by engineering analyses.

1.2 The documentation shall be consistent with the principle that the Facility Ratings do not exceed the most limiting applicable Equipment Rating of the individual equipment that comprises that Facility.

R2. Each Generator Owner shall have a documented methodology for determining Facility Ratings (Facility Ratings methodology) of its solely and jointly owned equipment connected between the location specified in R1 and the point of interconnection with the Transmission Owner that contains all of the following.

2.1. The methodology used to establish the Ratings of the equipment that comprises the Facility (ies) shall be consistent with at least one of the following:

- Ratings provided by equipment manufacturers or obtained from equipment manufacturer specifications such as nameplate rating.
- One or more industry standards developed through an open process such as Institute of Electrical and Electronic Engineers (IEEE) or International Council on Large Electric Systems (CIGRE).
- A practice that has been verified by testing, performance history or engineering analysis.

2.2. The underlying assumptions, design criteria, and methods used to determine the Equipment Ratings identified in Requirement R2, Part 2.1 including identification of how each of the following were considered:

2.2.1. Equipment Rating standard(s) used in development of this methodology.

2.2.2. Ratings provided by equipment manufacturers or obtained from equipment manufacturer specifications.

2.2.3. Ambient conditions (for particular or average conditions or as they vary in real-time).

2.2.4. Operating limitations.

2.3. A statement that a Facility Rating shall respect the most limiting applicable Equipment Rating of the individual equipment that comprises that Facility.

2.4. The process by which the Rating of equipment that comprises a Facility is determined.

2.4.1. The scope of equipment addressed shall include, but not be limited to, conductors, transformers, relay protective devices, terminal equipment, and series and shunt compensation devices.

2.4.2. The scope of Ratings addressed shall include, as a minimum, both Normal and Emergency Ratings.

R3. Each Transmission Owner shall have a documented methodology for determining Facility Ratings (Facility Ratings methodology) of its solely and jointly owned Facilities (except for those generating unit Facilities addressed in R1 and R2) that contains all of the following:

3.1. The methodology used to establish the Ratings of the equipment that comprises the Facility shall be consistent with at least one of the following:

- Ratings provided by equipment manufacturers or obtained from equipment manufacturer specifications such as nameplate rating.
- One or more industry standards developed through an open process such as Institute of Electrical and Electronics Engineers (IEEE) or International Council on Large Electric Systems (CIGRE).
- A practice that has been verified by testing, performance history or engineering analysis.

3.2. The underlying assumptions, design criteria, and methods used to determine the Equipment Ratings identified in Requirement R3, Part 3.1 including identification of how each of the following were considered:

3.2.1. Equipment Rating standard(s) used in development of this methodology

3.2.2. Ratings provided by equipment manufacturers or obtained from equipment manufacturer specifications.

3.2.3. Ambient conditions (for particular or average conditions or as they vary in real-time).

3.2.4. Operating limitations.

3.3. A statement that a Facility Rating shall respect the most limiting applicable Equipment Rating of the individual equipment that comprises that Facility.

3.4. The process by which the Rating of equipment that comprises a Facility is determined.

3.4.1. The scope of equipment addressed shall include, but not be limited to, transmission conductors, transformers, relay protective devices, terminal equipment, and series and shunt compensation devices. 3.4.2. The scope of

Ratings addressed shall include, as a minimum, both Normal and Emergency Ratings.

R4. Each Transmission Owner shall make its Facility Ratings methodology and each Generator Owner shall each make its documentation for determining its Facility Ratings and its Facility Ratings methodology available for inspection and technical review by those Reliability Coordinators, Transmission Operators, Transmission Planners and Planning Coordinators that have responsibility for the area in which the associated Facilities are located, within 21 calendar days of receipt of a request.

R5. If a Reliability Coordinator, Transmission Operator, Transmission Planner or Planning Coordinator provides documented comments on its technical review of a Transmission Owner's Facility Ratings methodology or Generator Owner's documentation for determining its Facility Ratings and its Facility Rating methodology, the Transmission Owner or Generator Owner shall provide a response to that commenting entity within 45 calendar days of receipt of those comments. The response shall indicate whether a change will be made to the Facility Ratings methodology and, if no change will be made to that Facility Ratings methodology, the reason why.

R6. Each Transmission Owner and Generator Owner shall have Facility Ratings for its solely and jointly owned Facilities that are consistent with the associated Facility Ratings methodology or documentation for determining its Facility Ratings.

R7. Each Generator Owner shall provide Facility Ratings (for its solely and jointly owned Facilities that are existing Facilities, new Facilities, modifications to existing Facilities and re-ratings of existing Facilities) to its associated Reliability Coordinator(s), Planning Coordinator(s), Transmission Planner(s), Transmission Owner(s) and Transmission Operator(s) as scheduled by such requesting entities.

R8. Each Transmission Owner (and each Generator Owner subject to Requirement R2) shall provide requested information as specified below (for its solely and jointly owned Facilities that are existing Facilities, new Facilities, modifications to existing Facilities and re-ratings of existing Facilities) to its associated Reliability Coordinator(s), Planning Coordinator(s), Transmission Planner(s), Transmission Owner(s) and Transmission Operator(s):

8.1. As scheduled by the requesting entities:

8.1.1. Facility Ratings

8.1.2. Identity of the most limiting equipment of the Facilities

8.2. Within 30 calendar days (or a later date if specified by the requester), for any requested Facility with a Thermal Rating that limits the use of Facilities under the requester's authority by causing any of the following: 1) An Interconnection Reliability Operating Limit, 2) A limitation of Total Transfer Capability, 3) An impediment to generator deliverability, or 4) An impediment to service to a major load center:

8.2.1. Identity of the existing next most limiting equipment of the Facility

8.2.2. The Thermal Rating for the next most limiting equipment identified in Requirement R8, Part 8.2.1.

Document Management

Review and Update Responsibility and Cycle

Review Responsibility: System Planning, and Transmission, Substation and Protection and Control Engineering Departments
Review Cycle: Procedure and facility rating spreadsheet shall be reviewed annually, and update as necessary
Review Procedure:

- Review NERC and/or WECC requirements and ensure the procedure addresses the most current version of this standard
- Update distribution list as necessary

Approvals

Date	Name/Signature	Title
1/15/20	David Tovar	David Tovar, Manager System Planning

Revision History

Effective Date	Version	Revised By	Revision History
01/15/2020	8.0	System Planning Transmission, Substation, and Protection & Control Engineering NCG	Annual review with errata changes
02/12/2019	7.0	System Planning Transmission, Substation, and Protection & Control Engineering	Review and update input assumption criteria
08/01/2017	6.0	System Planning Transmission, Substation, and Protection & Control Engineering	Revised
4/25/2017	5.0	System Planning, Transmission, Substation, and Protection & Control Engineering	Revised substation rating methodology
10/01/2016	4.0	System Planning Transmission, Substation & Protection and Control Engineering Rhonda Bryant	Reformatted document and updated with changes to equipment specifications
01/01/2013	3.0	Rhonda Bryant Dennis Malone	Revised to correct NERC Standard references, updated autotransformer rating references, added Information Availability section and clarified limiting rating references concerning various Facilities
01/13/2012	2.0	Dennis Malone	Revised overhead transmission lines section to include an overview

05/31/2011	1.0	Rhonda Bryant Dennis Malone Claudia Deneen	Revised relay section to include reference on NERC guidelines for loadability; and updated version history format
01/09/2009	0.0	Dennis Malone Adrian Aguirre	New Document

Distribution

Date	Name	Department
1/20/2020	Gerry Pulido	System Planning
	Roberto Favela	System Planning
	David Tovar	System Planning
	Adrian Aguirre-Lozano	TSR Engineering
	Liliana Bustamante	Substation Engineering
	Daniel Esparza	Substation Engineering
	Alex Aboytes	Protection and Control Engineering
	Francisco Melendez	Transmission Engineering
	Mariana Mercado Prieto	Transmission Engineering
	Luz Ramos	System Operations
	Luis Vincente	System Operations
	Penny Montes	Protection and Control
	Tracy Van Slyke	EMS Support
	Randy Harlas	T&D
	Rhonda Bryant	NERC Compliance Group
	Louis Vigil	System Planning