

# **Zonal Planning Criteria**

## **SPP Regional Planning Group Proposal Zone 1**

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## **Purpose**

To document the Zonal Planning Criteria (ZPC) for Zone 1 of the Southwest Power Pool (SPP) Regional Transmission Organization (RTO). The Zone 1 Planning Criteria described herein supplements the: 1) North American Electric Reliability Corporation (NERC) Transmission Planning TPL-001-5 — Transmission System Planning Performance Requirements; and 2) SPP Planning Criteria, Section 5 “Regional Transmission Planning” that SPP applies to its planning studies on an annual basis.

## **Scope**

This Zonal Planning Criteria applies to all facilities in Zone 1 with a nominal operating voltage of 69 kV or higher and that is part of or embedded within Zone 1, including facilities that are not subject to the SPP Tariff.

## **SPP Zone 1 Planning Criteria**

### **Loading Criteria**

#### **Normal Rating (Pre-contingency conditions)**

No facilities shall exceed their seasonal normal ratings under pre-contingency conditions.

#### **Emergency Rating (Post-contingency conditions)**

No facilities shall exceed their seasonal emergency ratings under post-contingency conditions.

### **Voltage Criteria**

#### **Normal Conditions (Pre-contingency)**

All Transmission Level Busses shall maintain a voltage of 0.95-1.05 p.u. under normal system operating conditions.

#### **Emergency Conditions (Post-contingency)**

All Transmission Level Busses shall maintain a voltage of 0.92-1.05 p.u. under post contingency conditions.

### **N-1 Criteria**

Single contingency (N-1) analysis shall be performed on all facilities in Zone 1 with a nominal operating voltage of 69 kV or higher.

### **Radial to Loop Conversion Criteria**

Facilities within SPP Zone 1 operated radially will qualify for conversion to loop operation with zonal cost recovery if meet any ONE of the following criteria:

- (a) Peak load that exceeds 75 MW-mile.

OR

- (b) A single radial substation feeding 35 MW or greater of peak load.

Facilities that do not meet the Radial to Loop Conversion Criteria may be looped, but the cost recovery of such facilities will be direct assignment to the benefiting Transmission Owner.

**Radial to Loop Conversion Criteria Study Methodology**

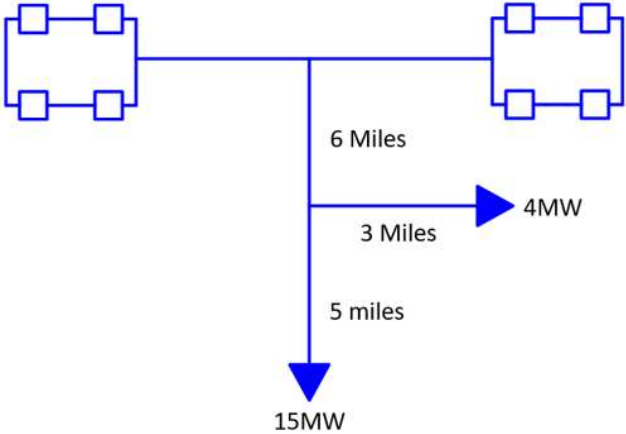
- 1) Study will be conducted with using the SPP ITP Summer Peak and Winter Peak year 5 models.
- 2) Where two radials of different voltage classes meet at an open point or are in close proximity to each other, an acceptable solution will be to install a transformer at a new or existing station and performing line voltage conversions as needed.
- 3) When a facility is an open-loop facility, it is acceptable to mitigate the megawatt-mile exposure by solutions other than converting the open-loop to closed-loop operation.

**Example of Radial to Loop Conversion Megawatt-mile Criteria application**

Megawatt-mile is calculated by multiplying the load in megawatts by the line length in miles from the load to the point on the looped system where the radial or open loop originates. The megawatt-mile exposure is the sum total of all the segments on the facility being evaluated.

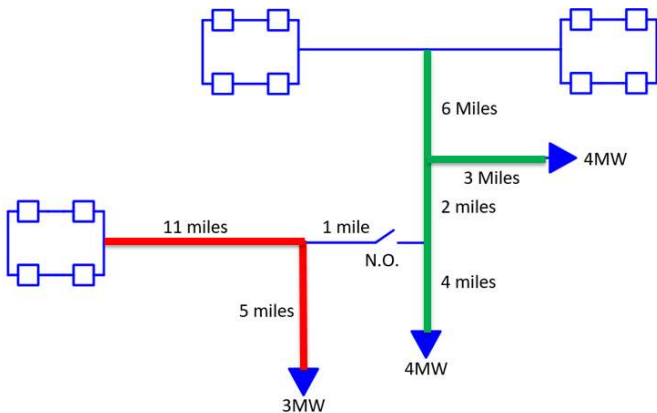
For facilities operating in an open-loop configuration, each portion is calculated and assessed independently of each other.

**Zone 1 Looping Criteria Calculation (Example 1-1)**



$$\text{MW-mile} = 4 \text{ MW} * (6 \text{ miles} + 3 \text{ miles}) + 15 \text{ MW} * (6 \text{ miles} + 5 \text{ miles}) = 201 \text{ MW-mile}$$

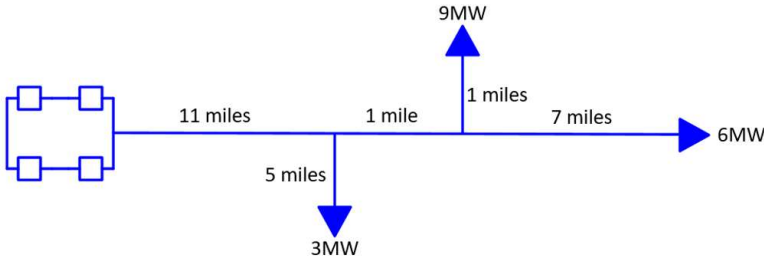
**Zone 1 Looping Criteria Calculation (Example 1-2)**



$$\text{MW-mile} = 4 \text{ MW} * (6 \text{ miles} + 3 \text{ miles}) + 4 \text{ MW} * (6 \text{ miles} + 2 \text{ miles} + 4 \text{ miles}) = 84 \text{ MW-mile}$$

$$\text{MW-mile} = 3 \text{ MW} * (11 \text{ miles} + 5 \text{ miles}) = 48 \text{ MW-mile}$$

**Zone 1 Looping Criteria Calculation (Example 1-3)**



$$\text{MW-mile} = 3 \text{ MW} * (5 \text{ miles} + 11 \text{ miles}) + 9 \text{ MW} * (11 \text{ miles} + 1 \text{ mile} + 1 \text{ mile})$$

$$+ 6 \text{ MW} * (11 \text{ miles} + 1 \text{ mile} + 7 \text{ miles}) = 279 \text{ MW-mile}$$

**Definitions**

- Bulk Electric System – As defined in the NERC glossary of terms.
- Transmission Level Bus – A bus with a nominal operating voltage of at least 69 kV.
- Normal Rating – As defined in the NERC glossary of terms.
- Emergency Rating – As defined in the NERC glossary of terms.
- Radial Systems: As defined in the NERC glossary of terms.
- Open Loop – Two or more Radial System connected via a switching device that is operated normally open.

**Glossary**

Follow Link for NERC glossary of terms – [NERC Glossary](#)