

**United States of America
Federal Energy Regulatory Commission**

**2019 FERC Form 715
Annual Transmission Planning and Evaluation Report
Part 4: Transmission Planning Reliability Criteria**

Overview:

The Dayton Power and Light Company's (DP&L) electric transmission facilities are designed to provide safe and reliable service to DP&L customers. DP&L's transmission system consists of 345 kV, 138 kV, and 69 kV transmission networks.

DP&L joined the PJM Regional Transmission Organization (RTO) in October 2004, and as such, PJM is responsible for planning the regional bulk electric system (BES - generally 100 kV and above, per North American Electric Reliability Corporation (NERC) definition), including evaluating transmission interconnection requests. DP&L's BES facilities include its 345 kV and 138 kV networks.

DP&L transmission facilities are planned using the DPL transmission planning criteria in conjunction with the reliability standards of NERC including the Transmission Planning (TPL) standards. The NERC Reliability Standards state the fundamental requirements for planning reliable interconnected bulk electric systems and the required actions or system performance necessary to comply. PJM and DP&L ensure the NERC reliability standards are met in designing the power system. Below is the link to the current NERC transmission reliability standards.

<https://www.nerc.com/pa/Stand/Reliability%20Standards/TPL-001-4.pdf>

Additionally, DP&L plans its transmission facilities to coordinate the development of the greater regional transmission system with neighboring systems and other member companies of PJM. PJM conducts a comprehensive system-wide assessment to ensure it meets all applicable reliability planning criteria. PJM annually performs comprehensive power flow, short circuit, and stability analyses as part of its Regional Transmission Expansion Plan (RTEP) process. The criteria PJM uses in developing the RTEP is outlined in PJM Manual 14B – “Regional Transmission Planning Process”.

Local Transmission Planning Criteria:

DP&L plans the local transmission system in coordination with PJM using DP&L's detailed planning criteria, which are outlined in the next sections. The DP&L criteria supplements the NERC Standards and PJM Planning Manual 14B. If there are violations of these criteria, DP&L will resolve them either by developing new transmission projects, operating procedures, or a combination of the two.

Voltage Limits

The table below shows the voltage limits for the DP&L transmission system under both normal and emergency conditions. The voltage limits are expressed as a percent of nominal voltage.

Nominal Voltage (kV)	Normal Voltage Limits		Emergency Voltage Limits	
	Minimum (%)	Maximum (%)	Minimum (%)	Maximum (%)
345	95%	105%	92%	105%
138	95%	105%	92%	105%
69	95%	105%	90%	105%

The transmission bus voltages will be between 0.95 per unit and 1.05 per unit in the system normal state (P0 of NERC TPL-001-4). In the post-contingency state (P1-P7 of NERC TPL-001-4), the transmission bus voltages for the 138kv and 345kv systems will be between 0.92 per unit and 1.05 per unit and the 69kv system will be between 0.9 per unit and 1.05 per unit. In addition, the transmission bus voltage shall not drop more than 10% below its pre-contingency value in the post-contingency state.

Thermal Limits

For general planning purposes, summer ratings are based on an ambient temperature of 95 degrees F and winter ratings are based on 32 degrees F.

No facility shall exceed its normal rating in the system normal state (P0 of NERC TPL-001-4).

No facility shall exceed its emergency rating in the post-contingency state (P1-P7 of NERC TPL-001-4).

Stability

The stability of The Dayton Power and Light Company's transmission system is in accordance with NERC TPL-001-4. TPL-001-4 R4.1.3 acceptable damping and R5 transient voltage response criteria may be found in PJM Manual 14B Attachment G2.2.

Fault Duty

All circuit breakers shall be capable of interrupting the maximum fault current duty imposed on the circuit breaker.

Single contingencies:

The thermal and voltage limits shall not be violated for either normal operations or under the loss of:

- a) A single generating unit
- b) A single transmission circuit
- c) A single transformer
- c) A single shunt device

An entire peaking plant or intermittent plant will be considered as a single generator for NERC Planning Events P1 and P3 for certain non-peak study scenarios. The DP&L transmission system shall be planned to handle a variety of generation dispatch scenarios and generally, depending on load levels, shall not be dependent on peaking plants or intermittent resources to mitigate thermal overloads or low voltage conditions.

Multiple and Extreme Contingencies:

NERC Reliability Standard TPL-001-4 includes a table that describes the steady state and stability performance planning events that must be evaluated for multiple contingencies (P3-P7). The table also describes the “Extreme Events” that shall be simulated.

In addition to the planning criteria outline above, DP&L will consider other factors, such as the likelihood of an event and the magnitude of its impact, when studying the system.