

## Attachment 1

The following clarifies which sections of the TIIR go into effect immediately and which are replaced with an existing technical requirement until the Commission provides Notice that IEEE 1547-2018 certified equipment is readily available (“Commission Notice”).<sup>1</sup> The “interim period” referred to below is from July 1, 2020, the date the TIIR goes into interim effect, until the Commission Notice announcing the TIIR is in full effect.

All sections of the TIIR shall go into effect on July 1, 2020 except for the following sections for inverter-based systems. Mutual agreement between parties does allow for utilization of the full TIIR during the interim period.

### **Section 4 (Performance Categories)**

This section does not go into effect until Commission Notice. No alternate provision is in place during the interim period.

### **Section 5 (Reactive Power Capability and Voltage/Power Control Performance)**

Sections 5.4 does not go into effect until Commission Notice unless mutual agreement exists between parties. In the interim period, the power factor requirements of Section 5.3 shall be used as default settings<sup>2</sup>.

### **Section 6 (Response to Abnormal Conditions)**

This section does not go into effect until Commission Notice. In the interim period, the following tables shall be considered default settings unless mutual agreement between parties exists.

*Table 1 - Synchronous DER Response (shall trip) to Abnormal Voltages*

<b>Shall Trip – Synchronous DER</b>		
<b>Shall Trip Function</b>	<b>Default Setting</b>	
	<b>Clearing time (s)</b>	<b>Voltage (p.u. of nominal voltage)</b>
UV2	0.16	0.50
UV1	2.0	0.88
OV1	1.0	1.10
OV2	0.16	1.20

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<sup>1</sup> MN PUC, ORDER 159427-01, Docket E-999/CI-16-521. Request input from the Technical Subgroup (TSG) of the Distributed Generation Workgroup (DGWG) as to when IEEE 1547-2018 certified equipment is “readily available” and delegate to the Executive Secretary the authority to notice when the full TIIR goes into effect in consultation with the TSG.

<sup>2</sup> IEEE 1547-2018 section 5.3.1, as referenced in the TIIR, does not apply in the interim period, but the constant power factor specification requirement can be applied.

Table 2 - Inverter DER Response (shall trip) to Abnormal Voltages

Shall Trip – Inverter DER		
Shall Trip Function	Default Setting	
	Clearing time (s)	Voltage (p.u. of nominal voltage)
UV2	0.16	0.50
UV1	2.0	0.88
OV1	1.0	1.10
OV2	0.16	1.20

Table 3 - DER Response (shall trip) to Abnormal Frequencies

Shall Trip Function	Default Setting	
	Clearing time (s)	Frequency (Hz)
UF1	0.16	59.3
OF1	0.16	60.5

**Section 9 (Interoperability)**

This section does not go into effect until Commission Notice. In the interim period, the Area EPS Operator’s TSM shall be used. The Area EPS Operator’s TSM shall contain Interoperability requirements comparable to section 5 (regarding metering and monitoring control requirements) of the 2004 State of Minnesota Distributed Generation Interconnection Requirements document.

**Section 12 (Enter Service and Synchronization)**

This section does not go into effect until Commission Notice. In the interim period, when entering service, the DER shall not energize the Area EPS until the applicable voltage and system frequency are within the ranges specified in Table 4, unless mutual agreement between parties exists.

Table 4 - DER Enter Service Criteria Ranges

Enter Service Criteria	Default settings	
Applicable voltage within range	Minimum Value	≥0.917 p.u.
	Maximum Value	≤1.05 p.u.
Frequency within range	Minimum Value	≥59.3 Hz
	Maximum value	≤60.5 Hz

DER shall be capable of delaying enter service by an intentional adjustable minimum delay when the Area EPS steady-state voltage and frequency are within the ranges specified in Table 4. The adjustable range of the minimum intentional delay shall be 0 s to 300 s with a default minimum delay of 300 s.

**Section 14 (Test and Verification Requirements)**

This section does not go into effect until Commission Notice. In the interim period, the Area EPS Operator’s TSM shall be used. The Area EPS Operator’s TSM shall contain Test and Verification requirements comparable to section 8 of the 2004 State of Minnesota Distributed Generation Interconnection Requirements document.