

Standard MTPL-007-0, Subsynchronous Resonance (SSR)

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A. Introduction

1. **Title:** Subsynchronous Resonance (SSR) Requirement

2. **Number:** MTPL-007-0

3. **Purpose:**

To ensure subsynchronous resonance does not occur in the Midwest Reliability Organization (MRO)

4. **Applicability**

4.1. Planning Authority,

4.2. Transmission Planner,

4.3. Generator Owner,

4.4. Transmission Owner

5. **(Proposed) Effective Date:** January 1, 2006

B. Requirements

R1. The Planning Authority or Transmission Planner, based upon their responsibilities, shall demonstrate through a valid subsynchronous resonance assessment that all series capacitors or other system additions or enhancements that are added to the Bulk Electric System that have significant potential to excite sustained subsynchronous oscillations are planned, designed, and constructed to avoid creating a subsynchronous resonance condition. To be valid, the Planning Authority or Transmission Planner assessment shall:

R1.1. Be performed prior to the in-service date of the series capacitor or other system additions or enhancements. Series capacitors or other system additions or enhancements that are potential SSR scenarios include the following:

R1.1.1. Transmission system equipment such as series capacitors, HVdc terminals, and SVC systems that are electrically close to a turbine-generator.

R1.1.2. Large loads greater than 100 MW such as electric arc furnaces, rolling mills, cycloconverters, and other large industrial drives, that are electrically close to a turbine-generator.

R1.1.3. System operating practices such as high-speed reclosing and single-pole switching on transmission lines electrically close to a turbine-generator.

R1.2. Consist of initial studies (such as frequency scanning) that determine whether there is evidence of a potential subsynchronous resonance (SSR) condition for all turbine-generators that are electrically close to the series capacitor or other system additions or enhancements.

R1.3. Consist of detailed studies (such as frequency scanning, eigenvalue analysis or electromagnetic transient simulation) if results from MTPL-007-0 R1.2 indicate evidence of the potential for a SSR Condition. The most accurate data available from the generator manufacturer and/or from field tests shall be provided by the Generator Owner to confirm the condition.

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R1.4. Consider the effect of contingency conditions defined in Categories B, C and D of Table I of NERC Reliability Standards TPL-002-0, TPL-003-0 and TPL-004-0.

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R2. When assessments confirm the potential for a SSR condition as prescribed in Reliability Standard MTPL-007-0_R1, the Planning Authority or Transmission Planner, based upon their responsibilities, shall provide a written summary of its corrective plans to mitigate the SSR condition, such as installing a SSR countermeasure, to the MRO and any impacted Transmission Owner(s) and Generator Owner(s).

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R3. The Planning Authority or Transmission Planner shall, based upon their responsibilities, within thirty (30) calendar days of a request, provide to the Midwest Reliability Organization the results of its subsynchronous resonance assessments and corrective plans.

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R4. Each Transmission Owner and/or Generator Owner shall provide information to its Transmission Operator on the status of all SSR countermeasures, if they are critical to preventing subsynchronous resonance for any contingencies defined in Category B or Category C of Table I of NERC Reliability Standard TPL-002-0 and TPL-003-0.

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C. Measures

M1. The Planning Authority or Transmission Planner shall have a valid SSR assessment and corrective plan as specified in MTPL-007-0_R1 and MTPL-007-0_R2.

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M2. The Planning Authority shall have evidence it reported documentation of results of its SSR assessments and corrective plans per Reliability Standard MTPL-007-0_R3.

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M3. The Transmission Owner and/or Generator Owner shall have evidence it reported the status of SSR countermeasures to its Transmission Operator per Reliability Standard MTPL-007-0_R4.

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D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Midwest Reliability Organization

1.2. Compliance Monitoring Period and Reset Timeframe

The Performance-Reset period shall be one calendar year from the last finding of non-compliance.

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1.3. Data Retention

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The Planning Authority or Transmission Planner shall, based upon their responsibilities, retain assessments for ten years.

The Generator Owner shall retain detailed manufacturer turbine-generator data for the life of the plant.

In addition, entities found non-compliant shall keep information related to the non-compliance until found compliant.

The Compliance Monitor shall retain any audit data for three years.

1.4. Additional Compliance Information

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The Planning Authority, Transmission Planner and Generator Owner shall demonstrate compliance through the following methods, as determined by the compliance monitor: Self certification or Audit (periodic, as part of targeted monitoring or initiated by complaint or event).

2. Levels of Non-Compliance

2.1. Level 1: A SSR assessment and corrective plan was provided as requested, but was incomplete in one or more areas.

2.2. Level 2: Not applicable.

2.3. Level 3: A valid SSR assessment and corrective plan was not provided.

2.4. Level 4: Corrective plan was not implemented where SSR assessment indicated a need for a corrective plan.
Status of SSR countermeasure was not reported.

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<#>Data Retention¶
None specified¶
<#>Additional Compliance Information¶
None¶

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be made prior to the in-service date of the series capacitor or other system additions or enhancements and as required by changes in the interconnected system (e.g.

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addition of new turbine-generator

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addition or replacement of turbine generator over 100 MVA).

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The Planning Authority and Transmission Planner shall

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to demonstrate that there is no evidence of a subsynchronous