

## Recommendation to Industry Consideration of Actual Field Conditions in Determination of Facility Ratings

Initial Distribution: October 7, 2010

**NERC and the Regional Entities have become aware of discrepancies between the design and actual field conditions of transmission facilities, including transmission conductors. These discrepancies may be both significant and widespread, with the potential to result in discrepancies in line ratings. The terms “transmission facilities” and “transmission lines” as used herein include generator tie lines, radial lines and interconnection facilities.**

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**Status:** Receipt Acknowledgement Required by October 20, 2010  
Reporting Required by December 15, 2010



**PUBLIC:** No Restrictions  
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**Instructions:** This NERC Recommendation is not the same as a Reliability Standard, and a failure to implement this Recommendation will not constitute the sole basis for an enforcement action. However, pursuant to Rule 810 of NERC's Rules of Procedure, you are required to report to NERC on the status of your activities in relation to this Recommendation. For U.S. entities, NERC will compile the responses and report them to the Federal Energy Regulatory Commission (FERC). NERC will use the responses from Canadian entities for its own purposes but will not include those responses in the compilation it sends to FERC.

Issuance of this Recommendation does not lower or otherwise alter the requirements of any approved Reliability Standard, or excuse the prior failure to follow the practices discussed in the Recommendation if such failure constitutes a violation of a Reliability Standard.

**Distribution:** **Primary Distribution: Primary Compliance Contacts for Transmission Owners and Operators, Generator Owners and Operators, Reliability Coordinators, Transmission Planners, and Planning Authorities.**

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**Primary Interest Groups:** Transmission Planning Engineers, Transmission Maintenance Engineers, and Transmission Planners

**Recommendation:** All recipients of this Recommendation should review the current Facility Ratings Methodology for their solely and jointly owned transmission lines to verify that the methodology used to determine facility ratings is based on actual field conditions. Line ratings depend on many limiting factors, including transmission facility placement, tower height, topographical profiles, and maintaining adequate conductor clearances (*i.e.*, conductor-to-ground, conductor-to-conductor) under a variety of ambient and loading conditions.

- Entities should determine if their Facility Ratings Methodology will produce appropriate ratings, even when considering differences between design and actual field conditions.

- Entities should review their transmission facility ratings to confirm that any differences observed between design and actual field conditions are within the design tolerances as defined by the Registered Entity's Facility Ratings Methodology.

If the entity has not previously verified that the facility design, installation, and field conditions are within design tolerances when the facilities are loaded at their rating, the entity should describe its plans to complete an assessment of its facilities to verify whether the actual field conditions conform to the entity's design tolerances in accordance with its Facility Ratings Methodology. The description of the plan for how and when all transmission lines will be assessed should be submitted to NERC by **December 15, 2010**. NERC recommends that the entity perform its assessment using methods or technology with adequate precision to show whether the actual field conditions support the entity's facility ratings. The entity should also explain how these measurements and assessment will be accomplished and the estimated length of time to complete the activity for all applicable facilities.

During conduct of the assessment, if the entity determines that the actual conductor clearances are not within the entity's design tolerances under existing or design conditions, the entity should coordinate their findings of the assessment with their respective Reliability Coordinator and Transmission Operator. This coordination should include establishing interim mitigation plans to address the assessment findings and any actions required to maintain bulk electric system stability and reliability. Although such plans may include derating of facilities consistent with actual field conditions, consideration should be given to optimizing the overall robustness and reliability of the bulk power system during the remediation period. Additionally, the entity is encouraged to coordinate its findings and interim mitigation plans with the Regional Entity, including the timeline and prioritization to promptly reconcile the conditions (e.g., modify construction, re-grade, de-energize, de-rate the line, etc.). The entity should also notify its Transmission Planner and Planning Authority of any limitation in the facility ratings due to the interim mitigation plan and update all operating instructions, procedures, SOLs, IROLs, study models and databases used to assess the system during the remediation period.

In the situations described, NERC considers actions to maintain the reliability and integrity of the bulk power system to be of paramount importance. NERC recognizes that assessment of existing conditions and any necessary remedial actions require careful planning, coordination, and sequencing to avoid introducing unintended new risks. Therefore, Transmission Owners, Transmission Operators, Generation Owners, and Generation Operators with solely or jointly owned transmission facilities (including generator tie lines, radial lines and interconnection facilities) are to take the following actions:

1. The registered entity must respond to this Recommendation by December 15, 2010 with a plan to conduct an assessment and any necessary remediation of the issues discussed in this Recommendation;
2. Within six months of the date of this Recommendation (April 7, 2011), the registered entity must identify and report to the applicable Reliability Coordinators and Regional Entities all transmission facilities (including generator tie lines, radial lines, and interconnection facilities) meeting the following conditions:
  - a. The existing or as-built conditions are different from the design conditions for the facilities; and
  - b. Those differences between actual and design

conditions result in incorrect ratings for the facilities.

3. The registered entity must correct the issues identified in its assessment as expeditiously as possible, but no later than 24 months following the date of this Recommendation, or October 7, 2012. No remediation plan may extend beyond 24 months without prior NERC approval, based on a clear demonstration by the registered entity of the need for such an extension based on scheduling constraints or other constraints beyond the control of the registered entity.

**Reporting Instructions:**

Primary Compliance Contacts at Registered Entities in receipt of this notice are required to acknowledge their receipt of this notice no later than 5:00 PM EDT on **October 20, 2010**. Registered Entities in receipt of this notice are required to report plans to address this Recommendation, including assessment methods to be used, and a timeline and priorities for any necessary remediation, via the online acknowledgement tool by filling out the attached questionnaire no later than 5:00 PM EDT on **December 15, 2010**. Access to this tool has been provided to Primary Compliance Contacts.

Respondents will need the following information to complete the questionnaire: NERC Compliance Registry ID Number, Registered Entity Name, and Primary Compliance Contact Information. Respondents will also need to respond whether or not their organization has appropriately addressed this Recommendation. An officer or other authorized representative of the recipient must certify the completeness and accuracy of the response.

**Webinar:**

NERC will host a Webinar to provide an overview of the issues and to answer questions regarding the alert and its associated response. The details for the Webinar are as follows:

Date: October 28, 2010  
Time: 1:00 – 3:00 PM Eastern

Registration Link: <https://cc.readytalk.com/r/dd8amgsvog>

This conference will be using a broadcast audio function that allows audio and video streaming directly through the participant's computer (a conference number is also available for those that don't have Web access).

Specific access information will be provided to those who register at the link above. Registration is complimentary, but limited.

**Background:**

A Transmission Owner experienced a conductor-to-ground fault caused by a vegetation contact with a bulk power system line that resulted in a lockout of that transmission line. Although vegetation caused the fault, the subsequent evaluation indicated that the conductor-to-ground clearance was less than expected. This was due to substantial inconsistencies between the actual topography within the easement of the transmission line and the design of the line. Additional evaluation determined that the root cause of the outage was due to insufficient clearances and other errors that occurred when the transmission line was originally designed and constructed.

As a direct result of the outage, the Transmission Owner contracted with a company that utilizes Light Detection and Ranging (LiDAR) and Power Line Systems – Computer Aided Design and Drafting (PLS-CADD) technologies to survey its 230 kV and 345 kV systems. The data was used to determine conductor-to-vegetation and conductor-to-ground clearances.

Using these advanced technologies, the Transmission Owner identified over 100 conductor-to-ground clearance issues that had gone previously undetected. This information was used to adjust the facility ratings for many of the lines where clearance issues were observed until modifications to the transmission line configuration or changes to the topography could be made. Other examples of inaccurate historical information included, but are not limited to, misplaced structures or supports, inadequate tower height, and ground profile inaccuracies.

NERC and the Regional Entities are concerned that Transmission Owners and Generator Owners have, in some instances, not considered existing field conditions when establishing facility ratings for transmission facilities, including transmission conductors. Transmission Owners should strive to achieve a heightened awareness of the actual operating conditions of their respective transmission conductors and take prompt corrective action as necessary.

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