

Standard PRC-003-1 — Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems

Standard Development Roadmap

This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.

This proposed standard is the Version 0 PRC-003 modified to include a translation of planning measure III.C.M10, which was not included in the approval Version 0 reliability standards because it required further work.

Development Steps Completed:

1. A SAR was posted from December 2, 2004, through January 7, 2005.
2. The SAC appointed a standard drafting team on January 13, 2005.
3. The drafting team posted its response to SAR comments and all other historical comments on April 19, 2005.
4. The drafting team posted draft 1 of the standard on April 21, 2005.
5. The drafting team posted draft 2 of the standard on September 1, 2005.

Description of Current Draft:

This is a pre-ballot version of the standard to be posted for industry review from December 1–30, 2005.

Future Development Plan:

| Anticipated Actions | Anticipated Date |
|----------------------------------------------------------------------------------|----------------------------|
| 1. Post standards and implementation plan for 30-day pre-ballot review. | December 1–30, 2005 |
| 2. Conduct first ballot. | January 3–12, 2006 |
| 3. Consider comments submitted with first ballot; post consideration of comments | January 13–16, 2006 |
| 4. Conduct second ballot. | January 17–26, 2006 |
| 5. Post standards and implementation plan for 30-day review by board. | January 6–February 6, 2006 |
| 6. Board adoption date. | February 6, 2006 |
| 7. Effective date. | May 1, 2006 |

Definitions of Terms Used in Standard

This section includes all newly defined or revised terms used in the proposed standard. Terms already defined in the Reliability Standards Glossary of Terms are not repeated here. New or revised definitions listed below become approved when the proposed standard is approved. When the standard becomes effective, these defined terms will be removed from the individual standard and added to the Glossary.

Misoperation:

- Any failure of a Protection System element to operate within the specified time when a fault or abnormal condition occurs within a zone of protection.
- Any operation for a fault not within a zone of protection (other than operation as backup protection for a fault in an adjacent zone that is not cleared within a specified time for the protection for that zone).
- Any unintentional Protection System operation when no fault or other abnormal condition has occurred unrelated to on-site maintenance and testing activity.

Corrective Action Plan: A list of actions and an associated timetable for implementation to remedy a specific problem.

Protection System: Protective relays, associated communication systems, voltage and current sensing devices, station batteries and DC control circuitry.

Standard PRC-003-1 — Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems

A. Introduction

1. **Title:** Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems
2. **Number:** PRC-003-1
3. **Purpose:** To ensure all transmission and generation Protection System Misoperations affecting the reliability of the Bulk Electric System (BES) are analyzed and mitigated.
4. **Applicability**
 - 4.1. Regional Reliability Organization
5. **Proposed Effective Date:** May 1, 2006.

B. Requirements

- R1. Each Regional Reliability Organization shall establish, document and maintain its procedures for, review, analysis, reporting and mitigation of transmission and generation Protection System Misoperations. These procedures shall include the following elements:
 - R1.1. The Protection Systems to be reviewed and analyzed for Misoperations (due to their potential impact on BES reliability).
 - R1.2. Data reporting requirements (periodicity and format) for Misoperations.
 - R1.3. Process for review, analysis follow up, and documentation of Corrective Action Plans for Misoperations.
 - R1.4. Identification of the Regional Reliability Organization group responsible for the procedures and the process for approval of the procedures.
- R2. Each Regional Reliability Organization shall maintain and periodically update documentation of its procedures for review, analysis, reporting, and mitigation of transmission and generation Protection System Misoperations.
- R3. Each Regional Reliability Organization shall distribute procedures in Requirement 1 and any changes to those procedures, to the affected Transmission Owners, Distribution Providers that own transmission Protection Systems, and Generator Owners within 30 calendar days of approval of those procedures.

C. Measures

- M1. The Regional Reliability Organization shall have procedures for the review, analysis, reporting and mitigation of transmission and generation Protection System Misoperations as defined in R1.
- M2. The Regional Reliability Organization shall have evidence it maintained and periodically updated its procedures for review, analysis, reporting and mitigation of transmission and generation Protection System Misoperations as defined in Requirement 2.
- M3. The Regional Reliability Organization shall have evidence it provided its procedures for the review, analysis, reporting and mitigation of transmission and generation Protection System Misoperations to the affected Transmission Owners, Distribution Providers that own transmission Protection Systems, and Generator Owners as defined in Requirement 3.

D. Compliance

1. **Compliance Monitoring Process**
 - 1.1. **Compliance Monitoring Responsibility**

Standard PRC-003-1 — Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems

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1.2. Compliance Monitoring Period and Reset Time Frame

One calendar year.

1.3. Data Retention

The Regional Reliability Organization shall retain documentation of its procedures for analysis of transmission and generation Protection System Misoperations and any changes to those procedures for three years.

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

1.4. Additional Compliance Information

The Regional Reliability Organization shall demonstrate compliance through self-certification or audit (periodic, as part of targeted monitoring or initiated by complaint or event), as determined by the Compliance Monitor.

2. Levels of Non-Compliance

2.1. Level 1: Procedures were not reviewed and updated within the review cycle period as required in R2.

2.2. Level 2: Procedures did not include one of the elements defined in R1.1 through R1.4.

2.3. Level 3: Procedures did not include two or more of the elements defined in R1.1 through R1.4.

2.4. Level 4: There shall be a level four non-compliance if either of the following conditions exist:

2.4.1 No evidence of Procedures.

2.4.2 Procedures were not provided to the affected Transmission Owners, Distribution Providers that own transmission Protection Systems, and Generator Owners as defined in R3.

E. Regional Differences

None identified.

Version History

| Version | Date | Action | Change Tracking |
|---------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 1 | December 1, 2005 | 1. Changed incorrect use of certain hyphens (-) to “en dash” (–) and “em dash (—).” 2. Changes “1 st ” to first and “2 nd ” to “second” in Anticipated Actions 2, 3, and 4, and lower cased “board” in 5. 3. Added “periods” to items where appropriate. 4. Changed “Timeframe” to “Time Frame” in item D, 1.2. | 01/20/06 |
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**Standard PRC-003-1 — Regional Procedure for Analysis of Misoperations of
Transmission and Generation Protection Systems**

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Standard PRC-004-1 — Analysis and Mitigation of Transmission and Generation Protection System Misoperations

Standard Development Roadmap

This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.

This proposed standard is the Version 0 PRC-004 modified to include a translation of planning measure III.C.M11, which was not included in the approval Version 0 reliability standards because it required further work.

Development Steps Completed:

1. A SAR was posted from December 2, 2004, through January 7, 2005.
2. The SAC appointed a standard drafting team on January 13, 2005.
3. The drafting team posted its response to SAR comments and all other historical comments on April 19, 2005.
4. The drafting team posted Draft 1 of the standard on April 21, 2005.
5. The drafting team posted Draft 2 of the standard on September 1, 2005

Description of Current Draft:

This is a pre-ballot version of the standard to be posted for industry review from December 1–30, 2005.

Future Development Plan:

| Anticipated Actions | Anticipated Date |
|----------------------------------------------------------------------------------|----------------------------|
| 1. Post standards and implementation plan for 30-day pre-ballot review. | December 1–30, 2005 |
| 2. Conduct first ballot. | January 3–12, 2006 |
| 3. Consider comments submitted with first ballot; post consideration of comments | January 13–16, 2006 |
| 4. Conduct second ballot. | January 17–26, 2006 |
| 5. Post standards and implementation plan for 30-day review by board. | January 6–February 6, 2006 |
| 6. Board adoption date. | February 6, 2006 |
| 7. Effective date. | August 1, 2006 |

Definitions of Terms Used in Standard

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No new definitions are proposed for this standard.

Standard PRC-004-1 — Analysis and Mitigation of Transmission and Generation Protection System Misoperations

A. Introduction

1. **Title:** Analysis and Mitigation of Transmission and Generation Protection System Misoperations
2. **Number:** PRC-004-1
3. **Purpose:** Ensure all transmission and generation Protection System Misoperations affecting the reliability of the Bulk Electric System (BES) are analyzed and mitigated.
4. **Applicability**
 - 4.1. Transmission Owner.
 - 4.2. Distribution Provider that owns a transmission Protection System.
 - 4.3. Generator Owner.
5. **Proposed Effective Date:** August 1, 2006.

B. Requirements

- R1.** The Transmission Owner and any Distribution Provider that owns a transmission Protection System shall each analyze its transmission Protection System Misoperations and shall develop and implement a Corrective Action Plan to avoid future Misoperations of a similar nature according to the Regional Reliability Organization's procedures developed for Reliability Standard PRC-003 Requirement 1.
- R2.** The Generator Owner shall analyze its generator Protection System Misoperations, and shall develop and implement a Corrective Action Plan to avoid future Misoperations of a similar nature according to the Regional Reliability Organization's procedures developed for PRC-003 R1.
- R3.** The Transmission Owner, any Distribution Provider that owns a transmission Protection System, and the Generator Owner shall each provide to its Regional Reliability Organization, documentation of its Misoperations analyses and Corrective Action Plans according to the Regional Reliability Organization's procedures developed for PRC-003 R1.

C. Measures

- M1.** The Transmission Owner, and any Distribution Provider that owns a transmission Protection System shall each have evidence it analyzed its Protection System Misoperations and developed and implemented Corrective Action Plans to avoid future Misoperations of a similar nature according to the Regional Reliability Organization procedures developed for PRC-003 R1.
- M2.** The Generator Owner shall have evidence it analyzed its Protection System Misoperations and developed and implemented Corrective Action Plans to avoid future Misoperations of a similar nature according to the Regional Reliability Organization's procedures developed for PRC-003 R1.
- M3.** Each Transmission Owner, and any Distribution Provider that owns a transmission Protection System, and each Generator Owner shall have evidence it provided documentation of its Protection System Misoperations, analyses and Corrective Action Plans according to the Regional Reliability Organization procedures developed for PRC-003 R1.

D. Compliance

1. **Compliance Monitoring Process**

Standard PRC-004-1 — Analysis and Mitigation of Transmission and Generation Protection System Misoperations

1.1. Compliance Monitoring Responsibility

Regional Reliability Organization.

1.2. Compliance Monitoring Period and Reset Time Frame

One calendar year.

1.3. Data Retention

The Transmission Owner, and Distribution Provider that own a transmission Protection System and the Generator Owner that owns a generation Protection System shall each retain data on its Protection System Misoperations and each accompanying Corrective Action Plan until the Corrective Action Plan has been executed or for 12 months, whichever is later.

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

1.4. Additional Compliance Information

The Transmission Owner, and any Distribution Provider that owns a transmission Protection System and the Generator Owner shall demonstrate compliance through self-certification or audit (periodic, as part of targeted monitoring or initiated by complaint or event), as determined by the Compliance Monitor.

2. Levels of Non-Compliance for Transmission Owners and Distribution Providers that own a Transmission Protection System:

2.1. Level 1: Documentation of Misoperations is complete according to PRC-004 R1, but documentation of Corrective Action Plans is incomplete.

2.2. Level 2: Documentation of Misoperations is incomplete according to PRC-004 R1 and documentation of Corrective Action Plans is incomplete.

2.3. Level 3: Documentation of Misoperations is incomplete according to PRC-004 R1 and there are no associated Corrective Action Plans.

2.4. Level 4: Misoperations have not been analyzed and documentation has not been provided to the Regional Reliability Organization according to Requirement 3.

3. Levels of Non-Compliance for Generator Owners

3.1. Level 1: Documentation of Misoperations is complete according to PRC-004 R2, but documentation of Corrective Action Plans is incomplete.

3.2. Level 2: Documentation of Misoperations is incomplete according to PRC-004 R2 and documentation of Corrective Action Plans is incomplete.

3.3. Level 3: Documentation of Misoperations is incomplete according to PRC-004 R2 and there are no associated Corrective Action Plans.

3.4. Level 4: Misoperations have not been analyzed and documentation has not been provided to the Regional Reliability Organization according to R3.

E. Regional Differences

None identified.

Standard PRC-004-1 — Analysis and Mitigation of Transmission and Generation Protection System Misoperations

Version History

| Version | Date | Action | Change Tracking |
|----------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 0 | April 1, 2005 | Effective Date | New |
| 1 | December 1, 2005 | <ol style="list-style-type: none"> 1. Changed incorrect use of certain hyphens (-) to “en dash” (–) and “em dash (—).” 2. Changes “1st” to first and “2nd” to “second” in Anticipated Actions 2, 3, and 4, and lower cased “board” in 5. 3. Added “periods” to items where appropriate. Changed “Timeframe” to “Time Frame” in item D, 1.2. | 01/20/06 |
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Standard PRC-005-1 — Transmission and Generation Protection System Maintenance and Testing

Standard Development Roadmap

This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.

This proposed standard is the Version 0 PRC-005 modified to include a translation of planning measure III.C.M12, which was not included in the approval Version 0 reliability standards because it required further work.

Development Steps Completed:

1. A SAR was posted from December 2, 2004 through January 7, 2005.
2. The SAC appointed a standard drafting team on January 13, 2005.
3. The drafting team posted its response to SAR comments and all other historical comments on April 19, 2005.
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| 2. Conduct first ballot. | January 3–12, 2006 |
| 3. Consider comments submitted with first ballot; post consideration of comments | January 13–16, 2006 |
| 4. Conduct second ballot. | January 17–26, 2006 |
| 5. Post standards and implementation plan for 30-day review by board. | January 6–February 6, 2006 |
| 6. Board adoption date. | February 6, 2006 |
| 7. Effective date. | May 1, 2006 |

Definitions of Terms Used in Standard

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No new definitions are proposed for this standard.

Standard PRC-005-1 — Transmission and Generation Protection System Maintenance and Testing

A. Introduction

1. **Title:** **Transmission and Generation Protection System Maintenance and Testing**
2. **Number:** PRC-005-1
3. **Purpose:** To ensure all transmission and generation Protection Systems affecting the reliability of the Bulk Electric System (BES) are maintained and tested.
4. **Applicability**
 - 4.1. Transmission Owner.
 - 4.2. Generator Owner.
 - 4.3. Distribution Provider that owns a transmission Protection System.
5. **Proposed Effective Date:** May 1, 2006.

B. Requirements

- R1. Each Transmission Owner and any Distribution Provider that owns a transmission Protection System and each Generator Owner that owns a generation Protection System shall have a Protection System maintenance and testing program for Protection Systems that affect the reliability of the BES. The program shall include:
 - R1.1. Maintenance and testing intervals and their basis.
 - R1.2. Summary of maintenance and testing procedures.
- R2. Each Transmission Owner and any Distribution Provider that owns a transmission Protection System and each Generator Owner that owns a generation Protection System shall provide documentation of its Protection System maintenance and testing program and the implementation of that program to its Regional Reliability Organization on request (within 30 calendar days). The documentation of the program implementation shall include:
 - R2.1. Evidence Protection System devices were maintained and tested within the defined intervals.
 - R2.2. Date each Protection System device was last tested/maintained.

C. Measures

- M1. Each Transmission Owner and any Distribution Provider that owns a transmission Protection System and each Generator Owner that owns a generation Protection System that affects the reliability of the BES, shall have an associated Protection System maintenance and testing program as defined in Requirement 1.
- M2. Each Transmission Owner and any Distribution Provider that owns a transmission Protection System and each Generator Owner that owns a generation Protection System that affects the reliability of the BES, shall have evidence it provided documentation of its associated Protection System maintenance and testing program and the implementation of its program as defined in Requirement 2.

D. Compliance

1. **Compliance Monitoring Process**
 - 1.1. **Compliance Monitoring Responsibility**

Regional Reliability Organization.

1.2. Compliance Monitoring Period and Reset Time Frame

One calendar year.

1.3. Data Retention

The Transmission Owner and any Distribution Provider that owns a transmission Protection System and each Generator Owner that owns a generation Protection System, shall retain evidence of the implementation of its Protection System maintenance and testing program for three years.

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

1.4. Additional Compliance Information

The Transmission Owner and any Distribution Provider that owns a transmission Protection System and the Generator Owner that owns a generation Protection System, shall each demonstrate compliance through self-certification or audit (periodic, as part of targeted monitoring or initiated by complaint or event), as determined by the Compliance Monitor.

2. Levels of Non-Compliance

2.1. Level 1: Documentation of the maintenance and testing program provided was incomplete as required in R1, but records indicate maintenance and testing did occur within the identified intervals for the portions of the program that were documented.

2.2. Level 2: Documentation of the maintenance and testing program provided was complete as required in R1, but records indicate that maintenance and testing did not occur within the defined intervals.

2.3. Level 3: Documentation of the maintenance and testing program provided was incomplete, and records indicate implementation of the documented portions of the maintenance and testing program did not occur within the identified intervals.

2.4. Level 4: Documentation of the maintenance and testing program, or its implementation, was not provided.

E. Regional Differences

None identified.

Version History

| Version | Date | Action | Change Tracking |
|---------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 0 | April 1, 2005 | Effective Date | New |
| 1 | December 1, 2005 | <ol style="list-style-type: none"> 1. Changed incorrect use of certain hyphens (-) to “en dash” (–) and “em dash (—).” 2. Changes “1st” to first and “2nd” to “second” in Anticipated Actions 2, 3, and 4, and lower cased “board” in 5. 3. Added “periods” to items where appropriate. 4. Changed “Timeframe” to “Time Frame” in item D, 1.2. | 01/20/05 |

Standard PRC-005-1 — Transmission and Generation Protection System Maintenance and Testing

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