

Standard Authorization Request Form

Title Revisions to Critical Infrastructure Protection Standards (revisions to CIP-002 through CIP-009)	
Request Date	March 1, 2008
Revision Date	June 9, 2008
Approved by Standards Committee for standard development on July 10, 2008	

SAR Requester Information	SAR Type (Check a box for each one that applies.)
Name NERC Staff <u>Name Dave Norton</u>	<input type="checkbox"/> New Standard
Primary Contact Scott R. Mix <u>Company Entergy</u>	<input checked="" type="checkbox"/> Revision to existing Standards
Telephone 215-853-8204 <u>(504) 576-5469</u> Fax	<input type="checkbox"/> Withdrawal of existing Standard
E-mail scott.mix@nerc.net <u>E-mail dnorto1@entergy.com</u>	<input type="checkbox"/> Urgent Action

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Purpose (Describe what the standard action will achieve in support of bulk power system reliability.)

To protect the critical cyber assets (including hardware, software, data, and communications networks) essential to the reliable operations of the bulk power system.

Industry Need (Provide a justification for the development or revision of the standard, including an assessment of the reliability and market interface impacts of implementing or not implementing the standard action.)

Implement Changes to the following Cyber Security Standards as indicated in FERC Order 706:

CIP-002-1	Critical Cyber Asset Identification
CIP-003-1	Security Management Controls
CIP-004-1	Personnel & Training
CIP-005-1	Electronic Security Perimeter(s)
CIP-006-1	Physical Security of Critical Cyber Assets
CIP-007-1	Systems Security Management
CIP-008-1	Incident Reporting and Response Planning
CIP-009-1	Recovery Plans for Critical Cyber Assets

Brief Description (Provide a paragraph that describes the scope of this standard action.)

This set of revisions ~~will implement the modifications directed in this project includes:~~

- ~~Modifying the standards so they conform to the latest approved versions of the ERO Rules of Procedure as outlined in the Standard Review Guidelines identified in Attachment 1.~~
- ~~Addressing the directives issued by FERC, in their Order 706, relative to the approved Cyber Security Standards CIP-002-1 through CIP-009-1. Refer to <http://www.ferc.gov/whats-new/comm-meet/2008/011708/E-2.pdf> for the complete text of the final order. Specific requirements from the Order will be identified during the SAR and/or Standards Drafting process.~~ in Attachment 2.
 - ~~In addition, the drafting team will modify the standards so they conform to the latest approved versions of the Reliability Standards Development Procedure and the ERO Rules of Procedure as outlined in the Standard Review Guidelines identified in Attachment 1.~~ Emphasis on Order 706 directive for NERC to address revisions to the CIP standards considering applicable feature of the NIST Security Risk Management Framework among other resources.
- ~~Incorporating clarifications from the Interpretation of CIP-006-1 Requirement 1.1.~~

~~NOTE: Additional issues identified by stakeholders during the posting of this SAR are listed in a supplementary SAR. The supplementary SAR will be posted for industry comment, and if supported by stakeholders, will be appended to this SAR Attachment 3.~~

Detailed Description (Provide a description of the proposed project with sufficient details for the standard drafting team to execute the SAR.)

~~This project requires reviewing each of the standards to ensure that it conforms to the latest version of the ERO Rules of Procedure, including the Reliability Standards Development Procedure as outlined in the Standard Review Guidelines (Attachment 1).~~

~~This proposed standards drafting project will address includes addressing all of the directed modifications identified in the FERC Final Order 706. There are a significant number of directed modifications to the set of cyber security standards. Some of them are of low consequence, and low controversy, while others are more significant changes, with more contentious issues. There may be a third set of changes that are in between these two extremes. Whether there are two or three "classes" of changes will be left to the Standards Drafting Team. These directives are summarized in Attachment 2.~~

~~As envisioned, the standard drafting team will address the "low hanging fruit" and rapid turn-around issues first, working on some of the more contentious issues while the less contentious issues are in either comment or ballot mode. This may allow for multiple revisions to the standards where some changes are reviewed by industry, balloted, and submitted for approval during the development and comment cycle of the remaining contentious issues. Revisions will incorporate the clarifications from the Interpretation of CIP-006-1 Requirement 1.1.~~

~~The end result of this SAR may be more than one set of revised standards submitted for approval. Revisions should consider other Cyber-related standards, guidelines and activities.~~

~~This SAR also proposes to add the following from the original Cyber Security Standards SAR finalized on March 8, 2004:~~

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- ~~Regional Entities and Purchasing-Selling Entity functions to the applicability section of the standards.~~
- ~~Reliability and Market Interface Principle 4 (plans for emergency operation and system restoration).~~

~~If additional Functional Model changes are made as a direct result of Order 706 (i.e., Demand Side Aggregator – see Order 706 paragraph 51), which directly impact the applicable functions, these functional entities will be added to the scope of the cyber security standards resulting from this SAR.~~

- Consider adopting the NIST Security Risk Management Framework (includes GAO, OMB and FIPS)
- Consider other cyber security related documents such as NIST, ISO 27000 Family, CIPC WG Risk Assessment Guideline, MITRE corporation technical report, DHS, National Laboratories papers, DOE 417, IEC, ISA, etc.
- Stay apprised of coordination work between FERC, NEI and NRC in regard to the nuclear facility exemption issue with respect to regulatory gaps. As necessary modify the standards to reflect current determinations.

Revisions should consider the additional issues identified by stakeholders in Attachment 3.

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Reliability Functions

The Standard will Apply to the Following Functions <i>(Check box for each one that applies.)</i>		
<input checked="" type="checkbox"/>	Regional Entity	Conducts the regional activities related to planning and operations, and coordinates activities of Responsible Entities to secure the reliability of the Bulk Electric System within the region and adjacent regions.
<input checked="" type="checkbox"/>	Reliability Coordinator	Responsible for the real-time operating reliability of its Reliability Coordinator Area in coordination with its neighboring Reliability Coordinator's wide area view.
<input checked="" type="checkbox"/>	Balancing Authority	Integrates resource plans ahead of time, and maintains load-interchange-resource balance within a Balancing Authority Area and supports Interconnection frequency in real time.
<input checked="" type="checkbox"/>	Interchange Authority	Ensures communication of interchange transactions for reliability evaluation purposes and coordinates implementation of valid and balanced interchange schedules between Balancing Authority Areas.
<input type="checkbox"/>	Planning Coordinator	Assesses the longer-term reliability of its Planning Coordinator Area.
<input type="checkbox"/>	Resource Planner	Develops a >one year plan for the resource adequacy of its specific loads within a Planning Coordinator area.
<input type="checkbox"/>	Transmission Planner	Develops a >one year plan for the reliability of the interconnected Bulk Electric System within its portion of the Planning Coordinator area.
<input checked="" type="checkbox"/>	Transmission Service Provider	Administers the transmission tariff and provides transmission services under applicable transmission service agreements (e.g., the pro forma tariff).
<input checked="" type="checkbox"/>	Transmission Owner	Owns and maintains transmission facilities.
<input checked="" type="checkbox"/>	Transmission Operator	Ensures the real-time operating reliability of the transmission assets within a Transmission Operator Area.
<input type="checkbox"/>	Distribution Provider	Delivers electrical energy to the End-use customer.
<input checked="" type="checkbox"/>	Generator Owner	Owns and maintains generation facilities.
<input checked="" type="checkbox"/>	Generator Operator	Operates generation unit(s) to provide real and reactive power.
<input type="checkbox"/>	Purchasing-Selling Entity	Purchases or sells energy, capacity, and necessary reliability-related services as required.
<input type="checkbox"/>	Market Operator	Interface point for reliability functions with commercial functions.
<input checked="" type="checkbox"/>	Load-Serving Entity	Secures energy and transmission service (and reliability-related services) to serve the End-use Customer.

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Reliability and Market Interface Principles

Applicable Reliability Principles <i>(Check box for all that apply.)</i>	
<input type="checkbox"/>	1. Interconnected bulk power systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards.
<input type="checkbox"/>	2. The frequency and voltage of interconnected bulk power systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.
<input type="checkbox"/>	3. Information necessary for the planning and operation of interconnected bulk power systems shall be made available to those entities responsible for planning and operating the systems reliably.
<input checked="" type="checkbox"/>	4. Plans for emergency operation and system restoration of interconnected bulk power systems shall be developed, coordinated, maintained and implemented.
<input checked="" type="checkbox"/>	5. Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk power systems.
<input checked="" type="checkbox"/>	6. Personnel responsible for planning and operating interconnected bulk power systems shall be trained, qualified, and have the responsibility and authority to implement actions.
<input checked="" type="checkbox"/>	7. The security of the interconnected bulk power systems shall be assessed, monitored and maintained on a wide area basis.
<input checked="" type="checkbox"/>	8. Bulk power systems shall be protected from malicious physical or cyber attacks.
Does the proposed Standard comply with all of the following Market Interface Principles? <i>(Select 'yes' or 'no' from the drop-down box.)</i>	
1. A reliability standard shall not give any market participant an unfair competitive advantage. Yes	
2. A reliability standard shall neither mandate nor prohibit any specific market structure. Yes	
3. A reliability standard shall not preclude market solutions to achieving compliance with that standard. Yes	
4. A reliability standard shall not require the public disclosure of commercially sensitive information. All market participants shall have equal opportunity to access commercially non-sensitive information that is required for compliance with reliability standards. Yes	

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Related Standards

Standard No.	Explanation
CIP-001	Sabotage Reporting (no change proposed)
CIP-002	Critical Cyber Asset Identification – FERC directed modifications
CIP-003	Security Management Controls – FERC directed modifications
CIP-004	Personnel and Training – FERC directed modifications
CIP-005	Electronic Security Perimeter – FERC directed modifications
CIP-006	Physical Security – FERC directed modifications
CIP-007	Systems Security Management – FERC directed modifications
CIP-008	Incident Reporting and Response Planning – FERC directed modifications
CIP-009	Recovery Plans – FERC directed modifications

Related SARs

SAR ID	Explanation
None	

Regional Variances

Region	Explanation
ERCOT	None
FRCC	None
MRO	None
NPCC	None
SERC	None
RFC	None
SPP	None
WECC	None

Attachment 1 - Standard Review Guidelines

Technical Basis in Engineering and Operations

Is this reliability standard based upon sound engineering and operating judgment, analysis, or experience, as determined by expert practitioners in that particular field?

Purpose

Does this reliability standard have a clear statement of purpose that describes how the standard contributes to the reliability of the bulk power system? Each purpose statement should include a value statement.

Applicability

Does this reliability standard clearly identify the functional classes of entities responsible for complying with the reliability standard, with any specific additions or exceptions noted? Where multiple functional classes are identified is there a clear line of responsibility for each requirement identifying the functional class and entity to be held accountable for compliance? Does the requirement allow overlapping responsibilities between Registered Entities possibly creating confusion for who is ultimately accountable for compliance?

Does this reliability standard identify the geographic applicability of the standard, such as the entire North American bulk power system, an interconnection, or within a regional entity area? If no geographic limitations are identified, the default is that the standard applies throughout North America.

Does this reliability standard identify any limitations on the applicability of the standard based on electric facility characteristics, such as generators with a nameplate rating of 20 MW or greater, or transmission facilities energized at 200 kV or greater or some other criteria? If no functional entity limitations are identified, the default is that the standard applies to all identified functional entities.

If the applicability is to a set of responsible entities that have criteria other than the criteria used in the compliance registration process, then the applicability section of the standard should include the reliability-related reason for the unique applicability criteria.

Effective Dates

Must be 1st day of 1st quarter after entities are expected to be compliant – must include time to file with regulatory authorities and provide notice to responsible entities of the obligation to comply. If the standard is to be actively monitored, time for the Compliance Monitoring and Enforcement Program to develop reporting instructions and modify the Compliance Data Management System(s) both at NERC and Regional Entities must be provided in the implementation plan. The effective date should be linked to the applicable regulatory approvals – here is the default sentence to use for standards that should become effective as soon as possible:

First day of first calendar quarter after applicable regulatory approval (or, in those jurisdictions where regulatory approval is not required, the standard becomes effective on the first day of the first calendar quarter after BOT adoption.)

Performance Requirements

Does this reliability standard state one or more performance requirements, which if achieved by the applicable entities, will provide for a reliable bulk power system, consistent with good utility practices and the public interest?

Does each requirement identify who shall do what under what conditions and to what outcome?

Fill-in-the-blank Requirements

Do not include any ‘fill-in-the-blank’ requirements. These are requirements that assign one entity responsibility for developing some performance measures without requiring that the performance measures be included in the body of a standard – then require another entity to comply with those requirements.

Every reliability objective can be met, at least at a threshold level, by a North American standard. If we need regions to develop regional standards, such as in under-frequency load shedding, we can always write a uniform North American standard for the applicable functional entities as a means of encouraging development of the regional standards.

Requirements for Regional Reliability Organization

Do not write any requirements for the Regional Reliability Organization. Any requirements currently assigned to the RRO should be re-assigned to the applicable functional entity. If the requirement can only be performed at a regional level, assign the requirement to the Regional Entity, not the RRO.

Violation Risk Factors

Each requirement must have an associated Violation Risk Factor (VRF). Avoid assigning a VRF to sub-requirements. If a sub-requirement needs a VRF that is different from the VRF assigned to the main requirement, then consider sub-dividing the requirement into multiple requirements. The VRF identifies the reliability-related risk of violating a requirement.

High Risk Requirement

A requirement that, if violated, could directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures;

or a requirement in a planning time frame that, if violated, could, under emergency, abnormal, or restorative conditions anticipated by the preparations, directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures, or could hinder restoration to a normal condition.

Medium Risk Requirement

A requirement that, if violated, could directly affect the electrical state or the capability of the bulk electric system, or the ability to effectively monitor and control the bulk electric system. However, violation of a medium risk requirement is unlikely to lead to bulk electric system instability, separation, or cascading failures;

or a requirement in a planning time frame that, if violated, could, under emergency, abnormal, or restorative conditions anticipated by the preparations, directly and adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor, control, or restore the bulk electric system. However, violation of a medium risk requirement is unlikely, under emergency, abnormal, or restoration conditions anticipated by the preparations, to lead to bulk electric system instability, separation, or cascading failures, nor to hinder restoration to a normal condition.

Lower Risk Requirement

A requirement that is administrative in nature and, if violated, would not be expected to adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor and control the bulk electric system.

A requirement that is administrative in nature;

~~or~~ and is a requirement in a planning time frame that, if violated, would not, under the emergency, abnormal, or restorative conditions anticipated by the preparations, be expected to

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adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor, control, or restore the bulk electric system. A planning requirement that is administrative in nature.

Time Horizon

The drafting team should also indicate the time horizon available for mitigating a violation to the requirement using the following definitions:

- **Long-term Planning** — a planning horizon of one year or longer.
- **Operations Planning** — operating and resource plans from day-ahead up to and including seasonal.
- **Same-day Operations** — routine actions required within the timeframe of a day, but not real-time.
- **Real-time Operations** — actions required within one hour or less to preserve the reliability of the bulk electric system.
- **Operations Assessment** — follow-up evaluations and reporting of real time operations.

Measurability

Is each performance requirement stated so as to be objectively measurable by a third party with knowledge or expertise in the area addressed by that requirement?

Does each performance requirement have one or more associated measures used to objectively evaluate compliance with the requirement? Measures should comply with the “Guidelines for Developing Measures and Compliance Elements in NERC Reliability Standards” reference document.

If performance results can be practically measured quantitatively, are metrics provided within the requirement to indicate satisfactory performance?

Violation Severity Levels

The drafting team should indicate a set of violation severity levels that can be applied for the requirements within a standard. (‘Violation severity levels’ replace existing ‘levels of non-compliance.’) The violation severity levels must be applied for each requirement and may be combined to cover multiple requirements, as long as it is clear which requirements are included and that all requirements are included.

The violation severity levels should be based on the following definitions and the latest version of the “Guidelines for Developing Measures and Compliance Elements in NERC Reliability Standards”:

- **Lower: mostly compliant with minor exceptions** — The responsible entity is mostly compliant with and meets the intent of the requirement but is deficient with respect to one or more minor details.
- **Moderate: mostly compliant with significant exceptions** — The responsible entity is mostly compliant with and meets the intent of the requirement but is deficient with respect to one or more significant elements.
- **High: marginal performance or results** — The responsible entity has only partially achieved the reliability objective of the requirement and is missing one or more significant elements.
- **Severe: poor performance or results** — The responsible entity has failed to meet the reliability objective of the requirement.

Compliance Enforcement Authority

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Replace, 'Regional Reliability Organization' with 'Regional Entity'

Replace, 'NERC' with 'ERO'

In situations where the Regional Entity is the responsible entity, or where a responsible entity works for the Regional Entity, the Compliance Enforcement Authority is the ERO. In all other situations, the Regional Entity is the Compliance Enforcement Authority.

Compliance Monitoring Period and Reset Timeframe

In all cases, enter, 'Not applicable.' (These terms are associated with an older version of the sanctions table. The next time the Reliability Standards Development Procedure is updated, the procedure will be revised to omit references to 'compliance monitoring period' and 'reset timeframe'.)

Data Retention

Use the data retention periods proposed in the "Guidelines for Developing Measures and Compliance Elements in NERC Reliability Standards" document unless there is a justifiable reason for proposing other data retention periods.

Compliance Monitoring Processes

The list of compliance monitoring processes used with each standard should comply with the proposed list of processes identified in the "Guidelines for Developing Measures and Compliance Elements in NERC Reliability Standards" reference document. In the standard, list the compliance monitoring processes under 'Additional Compliance Information.'

- Compliance Audits
- Self-Certifications
- Spot Checking
- Compliance Violation Investigations
- Self-Reporting
- Periodic Data Submittals
- Exception Reporting
- Complaints

Associated Documents

We will delay populating this section of the standard with a list of 'related' standards because standards are all being changed and many will have new numbers. We should limit the references to those support documents that are useful in complying with the standard.

Functional Model Version 3

Review the requirements against the latest descriptions of the responsibilities and tasks assigned to functional entities as provided in pages 13 through 53 of the draft Functional Model Version 3.

Completeness

Is this reliability standard complete and self-contained? Does the standard depend on external information to determine the required level of performance?

Clear Language

Is the reliability standard stated using clear and unambiguous language? Can responsible entities, using reasonable judgment and in keeping with good utility practices, arrive at a consistent interpretation of the required performance?

Consistent Terminology

To the extent possible, does this reliability standard use a set of standard terms and definitions that are approved through the NERC reliability standards development process?

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If the standard uses terms that are included in the NERC Glossary of Terms Used in Reliability Standards, then the term must be capitalized when it is used in the standard. New terms should not be added unless they have a 'unique' definition when used in a NERC reliability standard. Common terms that could be found in a college dictionary should not be defined and added to the NERC Glossary.

Practicality

Does this reliability standard establish requirements that can be practically implemented by the assigned responsible entities within the specified effective date and thereafter?

Consequences for Noncompliance

In combination with guidelines for penalties and sanctions, as well as other ERO and regional entity compliance documents, are the consequences of violating a standard clearly known to the responsible entities?

[Attachment 2 \(this is a large attachment and is in a self-contained file\)](#)

Attachment 3

Stakeholder Issues and Recommendations Identified During Initial SAR Posting

Industry Education

- Consider what to do with the existing FAQ document e.g., modify, replace.
- Consider how to provide additional guidance in support of these standards, e.g., Technical Reference documents, guidelines, white papers.
- Consider development of a guideline document to address extended LANs over multiple geographically dispersed locations.

Balloting and Implementation

- Determine the timing and grouping of revisions to be submitted to industry for comment and ballot, e.g., multi-phase or other approach.
- Determine the optimum implementation plan for revised CIP standards in this project.
- Address when newly identified critical assets or critical cyber assets, newly acquired equipment or assets, etc. must come into compliance with CIP standards.
- Address compliance issue where internal requirements exceed NERC requirements. Clarify in view of language contained in FERC Order 706 paragraph 377.

Clarify Existing Requirements

- Consider the need for different requirements for different environments e.g., control center, substation and generation plant.
- Clarify how serial and wireless devices are subject to these standards. Refer to pp 278 and 285 of FERC Order 706.

Other Issues

- Consider issues surrounding protection of data in motion.
- Consider the issue of hybrid devices that use both serial and routable protocols.
- Consider the issue of data versus information (electronic and/or hardcopy lists, drawings, etc.) protection including transport and transmittal of such information.
- Consider a clearly defined set of risks which can result in a more focused and effective set of compliance expectations.
- With regard to third-party vendors and contractors, provide clarification and additional guidance as to how much a responsible entity may rely on the processes and procedures of contractors and vendors that support the critical infrastructure of that responsible entity under the CIP standards and still be compliant with the standard.