

A. Introduction

1. **Title:** Cyber Security — Physical Security of Critical Cyber Assets
2. **Number:** CIP-006-4d
3. **Purpose:** Standard CIP-006-4 is intended to ensure the implementation of a physical security program for the protection of Critical Cyber Assets. Standard CIP-006-4 should be read as part of a group of standards numbered Standards CIP-002-4 through CIP-009-4.
4. **Applicability:**
 - 4.1. Within the text of Standard CIP-006-4, “Responsible Entity” shall mean:
 - 4.1.1 Reliability Coordinator
 - 4.1.2 Balancing Authority
 - 4.1.3 Interchange Authority
 - 4.1.4 Transmission Service Provider
 - 4.1.5 Transmission Owner
 - 4.1.6 Transmission Operator
 - 4.1.7 Generator Owner
 - 4.1.8 Generator Operator
 - 4.1.9 Load Serving Entity
 - 4.1.10 NERC
 - 4.1.11 Regional Entity
 - 4.2. The following are exempt from Standard CIP-006-4:
 - 4.2.1 Facilities regulated by the Canadian Nuclear Safety Commission.
 - 4.2.2 Cyber Assets associated with communication networks and data communication links between discrete Electronic Security Perimeters.
 - 4.2.3 In nuclear plants, the systems, structures, and components that are regulated by the Nuclear Regulatory Commission under a cyber security plan pursuant to 10 C.F. R. Section 73.54
 - 4.2.4 Responsible Entities that, in compliance with Standard CIP-002-4, identify that they have no Critical Cyber Assets
5. **Effective Date:** The first day of the eighth calendar quarter after applicable regulatory approvals have been received (or the Reliability Standard otherwise becomes effective the first day of the ninth calendar quarter after BOT adoption in those jurisdictions where regulatory approval is not required).

B. Requirements

- R1. Physical Security Plan — The Responsible Entity shall document, implement, and maintain a physical security plan, approved by the senior manager or delegate(s) that shall address, at a minimum, the following:
 - R1.1. All Cyber Assets within an Electronic Security Perimeter shall reside within an identified Physical Security Perimeter. Where a completely enclosed (“six-wall”) border cannot be established, the Responsible Entity shall deploy and document alternative measures to control physical access to such Cyber Assets.

- R1.2.** Identification of all physical access points through each Physical Security Perimeter and measures to control entry at those access points.
- R1.3.** Processes, tools, and procedures to monitor physical access to the perimeter(s).
- R1.4.** Appropriate use of physical access controls as described in Requirement R4 including visitor pass management, response to loss, and prohibition of inappropriate use of physical access controls.
- R1.5.** Review of access authorization requests and revocation of access authorization, in accordance with CIP-004-4 Requirement R4.
- R1.6.** A visitor control program for visitors (personnel without authorized unescorted access to a Physical Security Perimeter), containing at a minimum the following:
 - R1.6.1.** Logs (manual or automated) to document the entry and exit of visitors, including the date and time, to and from Physical Security Perimeters.
 - R1.6.2.** Continuous escorted access of visitors within the Physical Security Perimeter.
- R1.7.** Update of the physical security plan within thirty calendar days of the completion of any physical security system redesign or reconfiguration, including, but not limited to, addition or removal of access points through the Physical Security Perimeter, physical access controls, monitoring controls, or logging controls.
- R1.8.** Annual review of the physical security plan.
- R2.** Protection of Physical Access Control Systems — Cyber Assets that authorize and/or log access to the Physical Security Perimeter(s), exclusive of hardware at the Physical Security Perimeter access point such as electronic lock control mechanisms and badge readers, shall:
 - R2.1.** Be protected from unauthorized physical access.
 - R2.2.** Be afforded the protective measures specified in Standard CIP-003-4; Standard CIP-004-4 Requirement R3; Standard CIP-005-4 Requirements R2 and R3; Standard CIP-006-4 Requirements R4 and R5; Standard CIP-007-4; Standard CIP-008-4; and Standard CIP-009-4.
- R3.** Protection of Electronic Access Control Systems — Cyber Assets used in the access control and/or monitoring of the Electronic Security Perimeter(s) shall reside within an identified Physical Security Perimeter.
- R4.** Physical Access Controls — The Responsible Entity shall document and implement the operational and procedural controls to manage physical access at all access points to the Physical Security Perimeter(s) twenty-four hours a day, seven days a week. The Responsible Entity shall implement one or more of the following physical access methods:
 - Card Key: A means of electronic access where the access rights of the card holder are predefined in a computer database. Access rights may differ from one perimeter to another.
 - Special Locks: These include, but are not limited to, locks with “restricted key” systems, magnetic locks that can be operated remotely, and “man-trap” systems.
 - Security Personnel: Personnel responsible for controlling physical access who may reside on-site or at a monitoring station.
 - Other Authentication Devices: Biometric, keypad, token, or other equivalent devices that control physical access to the Critical Cyber Assets.

- R5.** Monitoring Physical Access — The Responsible Entity shall document and implement the technical and procedural controls for monitoring physical access at all access points to the Physical Security Perimeter(s) twenty-four hours a day, seven days a week. Unauthorized access attempts shall be reviewed immediately and handled in accordance with the procedures specified in Requirement CIP-008-4. One or more of the following monitoring methods shall be used:
- Alarm Systems: Systems that alarm to indicate a door, gate or window has been opened without authorization. These alarms must provide for immediate notification to personnel responsible for response.
 - Human Observation of Access Points: Monitoring of physical access points by authorized personnel as specified in Requirement R4.
- R6.** Logging Physical Access — Logging shall record sufficient information to uniquely identify individuals and the time of access twenty-four hours a day, seven days a week. The Responsible Entity shall implement and document the technical and procedural mechanisms for logging physical entry at all access points to the Physical Security Perimeter(s) using one or more of the following logging methods or their equivalent:
- Computerized Logging: Electronic logs produced by the Responsible Entity’s selected access control and monitoring method.
 - Video Recording: Electronic capture of video images of sufficient quality to determine identity.
 - Manual Logging: A log book or sign-in sheet, or other record of physical access maintained by security or other personnel authorized to control and monitor physical access as specified in Requirement R4.
- R7.** Access Log Retention — The Responsible Entity shall retain physical access logs for at least ninety calendar days. Logs related to reportable incidents shall be kept in accordance with the requirements of Standard CIP-008-4.
- R8.** Maintenance and Testing — The Responsible Entity shall implement a maintenance and testing program to ensure that all physical security systems under Requirements R4, R5, and R6 function properly. The program must include, at a minimum, the following:
- R8.1.** Testing and maintenance of all physical security mechanisms on a cycle no longer than three years.
 - R8.2.** Retention of testing and maintenance records for the cycle determined by the Responsible Entity in Requirement R8.1.
 - R8.3.** Retention of outage records regarding access controls, logging, and monitoring for a minimum of one calendar year.

C. Measures

- M1.** The Responsible Entity shall make available the physical security plan as specified in Requirement R1 and documentation of the implementation, review and updating of the plan.
- M2.** The Responsible Entity shall make available documentation that the physical access control systems are protected as specified in Requirement R2.
- M3.** The Responsible Entity shall make available documentation that the electronic access control systems are located within an identified Physical Security Perimeter as specified in Requirement R3.

- M4.** The Responsible Entity shall make available documentation identifying the methods for controlling physical access to each access point of a Physical Security Perimeter as specified in Requirement R4.
- M5.** The Responsible Entity shall make available documentation identifying the methods for monitoring physical access as specified in Requirement R5.
- M6.** The Responsible Entity shall make available documentation identifying the methods for logging physical access as specified in Requirement R6.
- M7.** The Responsible Entity shall make available documentation to show retention of access logs as specified in Requirement R7.
- M8.** The Responsible Entity shall make available documentation to show its implementation of a physical security system maintenance and testing program as specified in Requirement R8.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Enforcement Authority

1.2. The RE shall serve as the CEA with the following exceptions:

- 1.2.1** For entities that do not work for the Regional Entity, the Regional Entity shall serve as the Compliance Enforcement Authority.
- 1.2.2** For Reliability Coordinators and other functional entities that work for their Regional Entity, the ERO shall serve as the Compliance Enforcement Authority.
- 1.2.3** For Responsible Entities that are also Regional Entities, the ERO or a Regional Entity approved by the ERO and FERC or other applicable governmental authorities shall serve as the Compliance Enforcement Authority.
- 1.2.4** For the ERO, a third-party monitor without vested interest in the outcome for the ERO shall serve as the Compliance Enforcement Authority.

1.3. Compliance Monitoring and Enforcement Processes

Compliance Audits

Self-Certifications

Spot Checking

Compliance Violation Investigations

Self-Reporting

Complaints

1.4. Data Retention

- 1.4.1** The Responsible Entity shall keep documents other than those specified in Requirements R7 and R8.2 from the previous full calendar year unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.
- 1.4.2** The Compliance Enforcement Authority in conjunction with the Registered Entity shall keep the last audit records and all requested and submitted subsequent audit records.

1.5. Additional Compliance Information

- 1.5.1** The Responsible Entity may not make exceptions in its cyber security policy to the creation, documentation, or maintenance of a physical security plan.
- 1.5.2** For dial-up accessible Critical Cyber Assets that use non-routable protocols, the Responsible Entity shall not be required to comply with Standard CIP-006-4 for that single access point at the dial-up device.

2. Violation Severity Levels (Under development by the CIP VSL Drafting Team)

E. Regional Variances

None identified.

Version History

Version	Date	Action	Change Tracking
1	May 2, 2006	Adopted by NERC Board of Trustees	
1	January 18, 2008	FERC Order issued approving CIP-006-1	
	February 12, 2008	Interpretation of R1 and Additional Compliance Information Section 1.4.4 adopted by NERC Board of Trustees	Project 2007-27
2		Updated version number from -1 to -2 Modifications to remove extraneous information from the requirements, improve readability, and to bring the compliance elements into conformance with the latest guidelines for developing compliance elements of standards.	Project 2008-06
2	May 6, 2009	Adopted by NERC Board of Trustees	
	August 5, 2009	Interpretation of R4 adopted by NERC Board of Trustees	Project 2008-15
2	September 30, 2009	FERC Order issued approving CIP-006-2	
3	November 18, 2009	Updated version number from -2 to -3 Revised Requirement 1.6 to add a Visitor Control program component to the Physical Security Plan, in response to FERC order issued September 30, 2009. In Requirement R7, the term “Responsible Entity” was capitalized. Updated Requirements R1.6.1 and R1.6.2 to be responsive to FERC Order RD09-7	Project 2009-21
3	December 16, 2009	Adopted by NERC Board of Trustees	
	February 16, 2010	Interpretation of R1 and R1.1 adopted by NERC Board of Trustees	Project 2009-13
3	March 31,	FERC Order issued approving CIP-006-3	

	2010		
2a/3a	July 15, 2010	FERC Order issued approving the Interpretation of R1 and R1.1. Updated version numbers from -2/-3 to -2a/-3a.	
4	January 24, 2011	Adopted by NERC Board of Trustees	
3c/4c	May 19, 2011	FERC Order issued approving two interpretations: 1) Interpretation of R1 and Additional Compliance Information Section 1.4.4; and 2) Interpretation of R4. Updated version number from -3/-4 to -3c/-4c.	
3d/4d	February 9, 2012	Interpretation of R1.1 adopted by NERC Board of Trustees	Project 2008-10
3d/4d	March 21, 2013	FERC Order issued remanding the interpretation of R1.1.	

Appendix 1

Requirement Number and Text of Requirement
<p>R1. Physical Security Plan — The Responsible Entity shall create and maintain a physical security plan, approved by a senior manager or delegate(s) that shall address, at a minimum, the following:</p> <p style="padding-left: 40px;">R1.1. Processes to ensure and document that all Cyber Assets within an Electronic Security Perimeter also reside within an identified Physical Security Perimeter. Where a completely enclosed (“six-wall”) border cannot be established, the Responsible Entity shall deploy and document alternative measures to control physical access to the Critical Cyber Assets.</p>
Question
<p>If a completely enclosed border cannot be created, what does the phrase, “to control physical access” require? Must the alternative measure be physical in nature? If so, must the physical barrier literally prevent physical access e.g. using concrete encased fiber, or can the alternative measure effectively mitigate the risks associated with physical access through cameras, motions sensors, or encryption?</p> <p>Does this requirement preclude the application of logical controls as an alternative measure in mitigating the risks of physical access to Critical Cyber Assets?</p>
Response
<p>For Electronic Security Perimeter wiring external to a Physical Security Perimeter, the drafting team interprets the Requirement R1.1 as not limited to measures that are “physical in nature.” The alternative measures may be physical or logical, on the condition that they provide security equivalent or better to a completely enclosed (“six-wall”) border. Alternative physical control measures may include, but are not limited to, multiple physical access control layers within a non-public, controlled space. Alternative logical control measures may include, but are not limited to, data encryption and/or circuit monitoring to detect unauthorized access or physical tampering.</p>

Appendix 2

Interpretation of Requirement R1.1.

Request: *Are dial-up RTUs that use non-routable protocols and have dial-up access required to have a six-wall perimeters or are they exempted from CIP-006-1 and required to have only electronic security perimeters? This has a direct impact on how any identified RTUs will be physically secured.*

Interpretation:

Dial-up assets are Critical Cyber Assets, assuming they meet the criteria in CIP-002-1, and they must reside within an Electronic Security Perimeter. However, physical security control over a critical cyber asset is not required if that asset does not have a routable protocol. Since there is minimal risk of compromising other critical cyber assets dial-up devices such as Remote Terminals Units that do not use routable protocols are not required to be enclosed within a “six-wall” border.

CIP-006-1 — Requirement 1.1 requires a Responsible Entity to have a physical security plan that stipulate cyber assets that are within the Electronic Security Perimeter also be within a Physical Security Perimeter.

R1. Physical Security Plan — The Responsible Entity shall create and maintain a physical security plan, approved by a senior manager or delegate(s) that shall address, at a minimum, the following:

R1.1. Processes to ensure and document that all Cyber Assets within an Electronic Security Perimeter also reside within an identified Physical Security Perimeter. Where a completely enclosed (“six-wall”) border cannot be established, the Responsible Entity shall deploy and document alternative measures to control physical access to the Critical Cyber Assets.

CIP-006-1 — Additional Compliance Information 1.4.4 identifies dial-up accessible assets that use non-routable protocols as a special class of cyber assets that are not subject to the Physical Security Perimeter requirement of this standard.

1.4. Additional Compliance Information

1.4.4 For dial-up accessible Critical Cyber Assets that use non-routable protocols, the Responsible Entity shall not be required to comply with Standard CIP-006 for that single access point at the dial-up device.

Appendix 3

The following interpretation of CIP-006-1a — Cyber Security — Physical Security of Critical Cyber Assets, Requirement R4 was developed by the standard drafting team assigned to Project 2008-14 (Cyber Security Violation Severity Levels) on October 23, 2008.

Request:

1. *For physical access control to cyber assets, does this include monitoring when an individual leaves the controlled access cyber area?*
2. *Does the term, “time of access” mean logging when the person entered the facility or does it mean logging the entry/exit time and “length” of time the person had access to the critical asset?*

Interpretation:

No, monitoring and logging of access are only required for ingress at this time. The term “time of access” refers to the time an authorized individual enters the physical security perimeter.

Requirement Number and Text of Requirement

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| <p>R4. Logging Physical Access — Logging shall record sufficient information to uniquely identify individuals and the time of access twenty-four hours a day, seven days a week. The Responsible Entity shall implement and document the technical and procedural mechanisms for logging physical entry at all access points to the Physical Security Perimeter(s) using one or more of the following logging methods or their equivalent:</p> <p>R4.1. Computerized Logging: Electronic logs produced by the Responsible Entity’s selected access control and monitoring method.</p> <p>R4.2. Video Recording: Electronic capture of video images of sufficient quality to determine identity.</p> <p>R4.3. Manual Logging: A log book or sign-in sheet, or other record of physical access maintained by security or other personnel authorized to control and monitor physical access as specified in Requirement R2.3.</p> |
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Appendix 4¹

Interpretation of CIP-006-1 Cyber Security – Physical Security of Critical Cyber Assets for Progress Energy

Request for Interpretation Received from Progress Energy on April 2, 2008:

Request:

Progress Energy requests a formal interpretation of CIP-006-1, R1.1.

In CIP_006-1, Requirement 1.1 states “Processes to ensure and document that all Cyber Assets within an Electronic Security Perimeter (ESP) also reside within an identified Physical Security Perimeter. Where a completely enclosed (“six-wall”) border cannot be established, the Responsible Entity shall deploy and document alternative measures to control physical access to the Critical Cyber Assets.”

In CIP-005-1, Requirement 1 states “Electronic Security Perimeter — The Responsible Entity shall ensure that every Critical Cyber Asset resides within an Electronic Security Perimeter. The Responsible Entity shall identify and document the Electronic Security Perimeter(s) and all access points to the perimeter(s).”

In CIP-002-1, Requirement 3 states “Critical Cyber Asset Identification — Using the list of Critical Assets developed pursuant to Requirement R2, the Responsible Entity shall develop a list of associated Critical Cyber Assets essential to the operation of the Critical Asset. Examples at control centers and backup control centers include systems and facilities at master and remote sites that provide monitoring and control, automatic generation control, real-time power system modeling, and real-time interutility data exchange. The Responsible Entity shall review this list at least annually, and update it as necessary. For the purpose of Standard CIP-002, Critical Cyber Assets are further qualified to be those having at least one of the following characteristics:

- R3.1. The Cyber Asset uses a routable protocol to communicate outside the Electronic Security Perimeter; or,*
- R3.2. The Cyber Asset uses a routable protocol within a control center; or,*
- R3.3. The Cyber Asset is dial-up accessible.*

CIP-002-1 R3 defines Critical Cyber Assets as assets essential to the operation of Critical Asset and assets meeting one of the characteristics of R3.1, R3.2 or R3.3. It is unclear from the stated requirements the extent ESP wiring external to physical security perimeter must be protected within a six wall boundary. Progress Energy requests an interpretation as to the applicability of CIP-006-1 R1 to the aspects of the wiring that comprises the ESP.

CIP-006-1 Cyber Security – Physical Security of Critical Cyber Assets

R1. Physical Security Plan — The Responsible Entity shall create and maintain a physical security plan, approved by a senior manager or delegate(s) that shall address, at a minimum, the following:

¹ When the request for interpretation was made, it was for a previous version of the standard. Although the interpretation references a previous version of the standard, because it is still applicable in this case, it is appended to this version of the standard.

R1.1. Processes to ensure and document that all Cyber Assets within an Electronic Security Perimeter also reside within an identified Physical Security Perimeter. Where a completely enclosed (“six-wall”) border cannot be established, the Responsible Entity shall deploy and document alternative measures to control physical access to the Critical Cyber Assets.

The following revised interpretation of CIP-006-1 — Physical Security of Critical Cyber Assets Requirement R1.1 was developed by the CIP Interpretation Drafting Team’s Project 2008-10 Interpretation Drafting Team in response to industry comments received from the second initial ballot:

Interpretation of CIP-006-1 Requirement R1.1: *“...to ensure and document that all Cyber Assets within an Electronic Security Perimeter (ESP) also reside within an identified Physical Security Perimeter. Progress Energy requests an interpretation as to the applicability of CIP-006-1 R1 to the aspects of the wiring that comprises the ESP.*

Revised Response:

CIP-006-1, Requirement R1.1 applies to “Cyber Assets,” and the first test in determining whether it applies to wiring is to determine whether wiring is a “Cyber Asset.”

The definition of “Cyber Asset” in the *NERC Glossary of Terms Used in Reliability Standards* includes “communication networks,” but it does not explicitly include wiring or communication mediums in general. Since wiring is not included in the definition of “Cyber Asset,” Requirement R1.1 of CIP-006-1 does not apply to wiring.

This interpretation is limited to whether Requirement R1.1 applies to a particular circumstance (e.g., “wiring”), which makes it distinct from the interpretation in CIP-006-3c, appendix 1. The interpretation in CIP-006-3c, appendix 1, only applies when a completely enclosed (“six-wall”) border cannot be established for a “Cyber Asset” within an Electronic Security Perimeter (ESP).