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**Regional
Critical Asset
Identification
Guideline**

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Note:

Terms in bold typeface are defined in the *NPCC Glossary of Terms* (Document A-7).

1.0 Introduction

This document provides a set of guiding principles for consistent interpretation of Critical Assets within NPCC. “Critical Assets” is the term used in NERC’s CIP-002 Reliability Standard. This document is intended solely as a Regional Risk Methodology Guideline for CIP-002 R1 (Appendix A).

As a Guideline this document is not binding and that users, owners and operators may employ different methodologies to achieve compliance with the CIP Standards. In conclusion, the primary value of this type of guidance document is to provide users, owners and operators with support for making determinations of “criticality” with regard to potential factors where any individual owner or operator may not have all relevant information. Users, owners and operators may validly utilize other methodologies for identifying “Critical Assets” that are based on information that is readily available to them or may in fact be information that is available only to them.

Risk-based methodologies usually consider threat (likelihood) and consequence. This guideline recognizes that cyber attacks could happen and focuses on mitigation of consequences. Cyber attacks can result in either unauthorized operation of equipment or denial of service. Loss of control and/or monitoring of critical assets would have a significant impact on reliability, including the ability to restore after a partial or total blackout. Multiple element contingencies without accompanying faults are very probable under this type of threat.

There are several NPCC documents that are the basis for the development of this guideline. Those documents are:

- A-2 Basic Criteria for Design and Operation of Interconnected Power Systems*
- Directory 2 Emergency Operation*
- Directory 8 System Restoration*
- A-7 NPCC Glossary of Terms*
- A-10 Classification of Bulk Power System Elements*

The NPCC Criteria (also called “A” documents) and Directories implicitly use a risk assessment approach. The above documents are some of the NPCC Criteria documents. The NPCC Directories include criteria from retired NPCC Criteria documents. The NPCC Criteria and Directories define and use the Bulk Power System. This Guideline builds on that body of work.

NPCC Members may want to consider the Extreme Contingency Assessment in NPCC’s Regionally approved *A-2, Basic Criteria for Design and Operation of Interconnected Power Systems* as an additional screening tool to aid and identify a Member’s Critical Assets.

NPCC Directory 2, *Emergency Operation*, includes Regionally approved Criteria to present the basic factors to be considered in formulating plans and procedures to be followed in an emergency or during conditions which could lead to an emergency, in order to facilitate mutual assistance and coordination within NPCC.

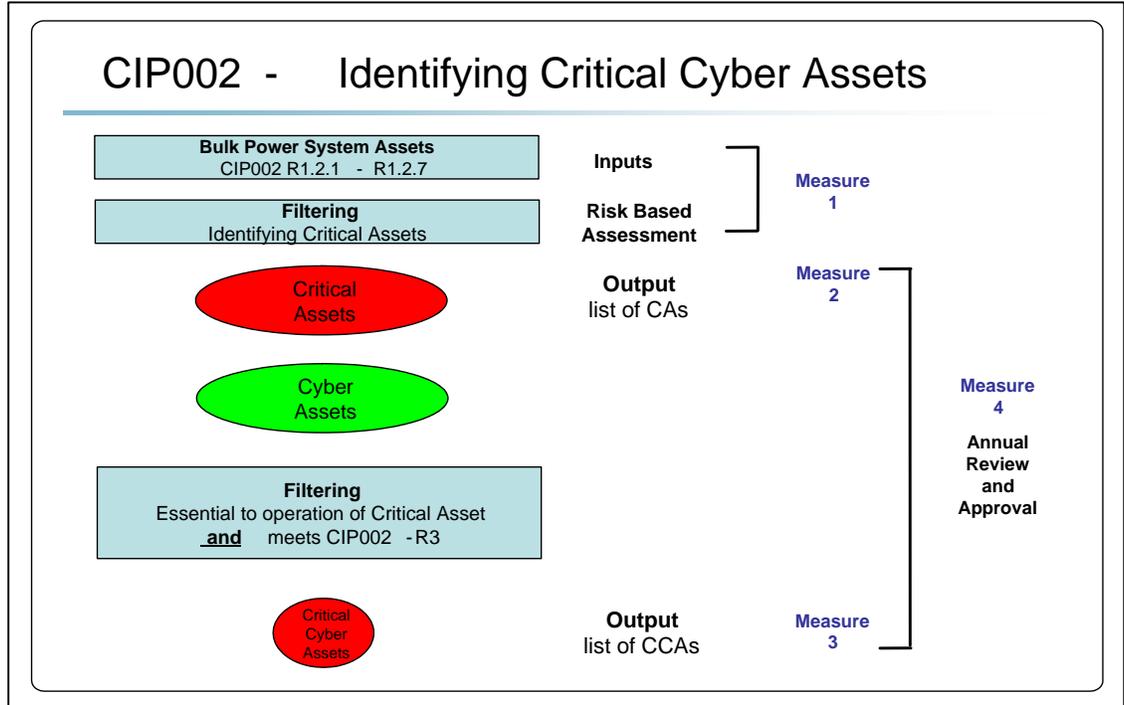
NPCC A-7, *NPCC Glossary of Terms*, is the reference document which lists the definitions NPCC uses throughout its Criteria, Guides and Procedures.

NPCC A-10, *Criteria for Classification of Bulk Power System Elements*, is a Regionally approved methodology “to be used as a tool to classify elements of the **bulk power system**.” (A-10 page 3). A-10’s Application of the Criteria states that each Area “shall maintain a list of **bulk power system elements**.”

NPCC Directory 8, *System Restoration*, stipulates the criteria for each **Area** to perform power system restoration following a major or a total blackout. NPCC’s A-7 definition of Key Facilities includes those required to establish a basic minimum power system following a system blackout. These facilities are essential to the restoration plan of the Control Area and include generating stations having blackstart units and other selected generating stations, transmission elements which are part of the basic minimum power system, and control centers.

2.0 High-level Critical Cyber Asset Methodology

The following diagram illustrates a model for identifying Critical Assets and Critical Cyber Assets. The diagram is from the 2006 Cyber Security Standards Workshop Presentations | Tab Q_NERC CIP002 – CIP009 Education – Audit Criteria – Version 12 Final rev2.ppt | slide 20 - CIP002 – Identifying Critical Cyber Assets.



This guideline is based on defining filters, and then applying those filters to Bulk Power System Assets, yielding a subset of assets that are deemed critical.

3.0 Critical Assets Identification Methodology

The utilization of a criteria-based checklist, supported by analysis, can be used to determine the list of Critical Assets. The combination of checklists and an analytical method already performed in support of the NPCC A-10 Regional Criteria provides a non-invasive, sustainable process.

3.1 Overview

The outlined filters described below may be applied to assets to determine their criticality to the power grid in the NPCC Region.

There are eight suggested filters. All assets will be listed and assessed against each of these filters. When an asset satisfies a filter, this methodology suggests that the asset be considered for evaluation as a Critical Asset, for the purposes of CIP-002. Some assets may satisfy more than one of the filters, which may affect the ranking and weighting applied for remediation.

4.0 Suggested Filters

4.1 Control Centers (CIP-002 R1.2.1)

FILTER - All primary and backup control centers should be considered for evaluation as Critical Assets. Within the Control Center, the functions performed that support the reliable operation of the Bulk Power System should be considered as assets for purposes of identifying critical cyber assets.

EXPLANATION - While Control Centers are called out in NERC Standard CIP-002 requirement R1.2.1, there is no formal definition. Control Center may mean the room or the building in which remote monitoring, operating and/or controlling of elements of the Bulk Power System are or can be performed in real time. Assuring assets are not inadvertently included as subject to CIP-002 through CIP-009 may require additional wording to separate critical assets subject to CIP from other assets that do not satisfy the filter criteria.

4.2 Substations (CIP-002 R1.2.2)

FILTER – 1) Any transmission substation meeting the criteria defined in the NPCC’s A-10 should be considered for evaluation as a Critical Asset. 2) If a generation resource (see 4.3) is considered for evaluation as a Critical Asset, the station service supply substation should also be considered for evaluation as a Critical Asset. 3) Substations involved in a restoration plan should be considered for evaluation as a Critical Asset (see 4.4).

EXPLANATION – 1) This recommendation is in support of requirement R1.2.2 - Transmission substations that support the reliable operation of the Bulk Power System. 2) This recommendation recognizes that the generation resources are useless without a transmission system to transport the power from the generators to the loads. 3) See explanation in 4.4.

4.3 Generation (CIP-002 R1.2.3)

FILTER:

- any generating unit or generating plant equal to or exceeding the Area's maximum single loss of generation contingency (normally equal to the ten-minute operating reserve requirement); or
- any generating station designated in the Area restoration plan as having blackstart capability.

This filter would define the minimum requirement at a regional level, and each Reliability Coordinator (RC) should have the authority to define additional requirements necessary for local Area reliability concern within the RC Area.

EXPLANATION: Generators are essential to the stability of the Bulk Power System and should be evaluated for criticality.

4.4 Blackstart (CIP-002 R1.2.4)

FILTER - The **basic minimum power system** (BMPS) consists of one or more generating stations, transmission lines, and substations operating in the form of an **island** for the purpose of initiating the restoration process. BMPS facilities should be considered for evaluation as Critical Assets.

EXPLANATION - Blackstart units are essential to restoration of the Bulk Power System following a blackout, and should be evaluated for criticality. For additional information see A-12, and the General Power System diagram at the end of this document.

4.5 Load Shedding (CIP-002 R1.2.5)

FILTER - Those NPCC Members that deploy automatic load shedding under a common control system capable of shedding 300 MW or more should consider such a system/facility for evaluation as Critical Assets.

EXPLANATION – Such an automatic load shedding system or facility could impact the Bulk Power System.

NOTE - This Guideline does not consider communications infrastructure because the NERC Standards do not.

4.6 Special Protection (CIP-002 R1.2.6)

FILTER - Any systems or facilities critical to Special Protection Schemes (SPS) classified by NPCC as Type 1 should be considered for evaluation as a Critical Asset.

EXPLANATION - Special Protection Schemes and Remedial Action Schemes are implemented to solve specific electrical problems, or to maintain a safe and reliable environment. Only wide-area schemes are included, since the local schemes do not affect interconnected Bulk Power System issues.

4.7 Other (CIP-002 R1.2.7)

This NERC Requirement (CIP-002 R1.2.7) suggests the consideration of other additional assets that support the reliable operation of the Bulk Power System. This guideline suggests that Tie Line Substations and Hub Sites be considered as Critical Assets, for this NERC Requirement.

4.7.1 Other – Tie Line Substations

FILTER - Each NPCC Member with inter-Regional tie line substations should define the threshold working in cooperation with their RC. Any tie line substation exceeding their threshold should be considered for evaluation as a Critical Asset. Neighboring Reliability Coordinators should coordinate classification of tie line substations that border their respective Areas.

EXPLANATION - During extreme power demands in the Region, the importing of power from interconnected neighbors is extremely important for the reliable operation of the grid.

4.8 Other – Concentrated Control Data Sites (Hub Sites / smart RTUs)

FILTER - Any substation that concentrates data/information from multiple control sites should be considered for evaluation as a Critical Asset.

EXPLANATION - Consider remote sites where access to critical cyber assets is granted by means of network configuration. Examples include substations with data aggregation / concentrators and SCADA

connectivity, plant chemical or emissions buildings with access to DCS network, and customer service or field maintenance facilities. Concentrated Control Data Sites where access to control system networks is granted by means of a routable protocol should be evaluated as “control centers.”

Appendix A

This appendix is a copy of CIP-002 R1 from
ftp://www.nerc.com/pub/sys/all_updl/standards/rs/CIP-002-1.pdf

R1. Critical Asset Identification Method — The Responsible Entity shall identify and document a risk-based assessment methodology to use to identify its Critical Assets.

R1.1. The Responsible Entity shall maintain documentation describing its risk-based assessment methodology that includes procedures and evaluation criteria.

R1.2. The risk-based assessment shall consider the following assets:

R1.2.1. Control centers and backup control centers performing the functions of the entities listed in the Applicability section of this standard.

R1.2.2. Transmission substations that support the reliable operation of the Bulk Electric System.

R1.2.3. Generation resources that support the reliable operation of the Bulk Electric System.

R1.2.4. Systems and facilities critical to system restoration, including blackstart generators and substations in the electrical path of transmission lines used for initial system restoration.

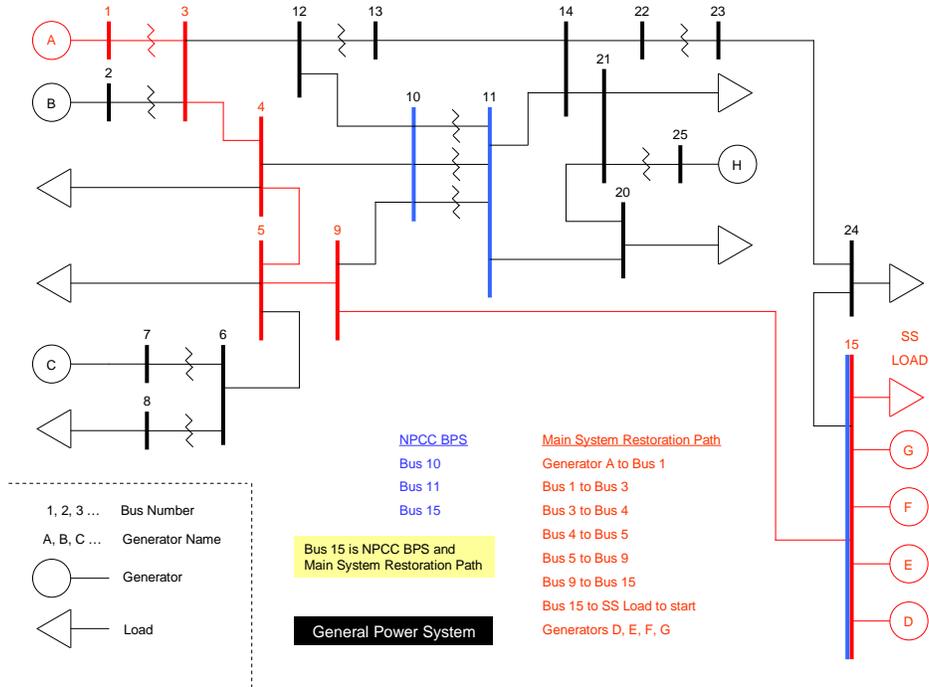
R1.2.5. Systems and facilities critical to automatic load shedding under a common control system capable of shedding 300 MW or more.

R1.2.6. Special Protection Systems that support the reliable operation of the Bulk Electric System.

R1.2.7. Any additional assets that support the reliable operation of the Bulk Electric System that the Responsible Entity deems appropriate to include in its assessment.

Appendix B

General Power System (referenced in Section 4.4)



Prepared by: Task Force on Infrastructure Security and Technology

Review frequency: 3 years

References: *Basic Criteria for Design and Operation of Interconnected Power Systems*
(Document A-2)

Emergency Operation (Directory 2)

NPCC Glossary of Terms (Document A-7)

Classification of Bulk Power System Elements (Document A-10)

System Restoration (Directory 8)