**Document A-3**

NORTHEAST POWER COORDINATING COUNCIL

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# Emergency Operation Criteria

Adopted by the Members of the Northeast Power Coordinating Council January 25, 1982, based on recommendation by the Operating Procedure Coordinating Committee and the System Design Coordinating Committee, in accordance with paragraph IV, subheading (a), of NPCC 's *Memorandum of Agreement* dated January 19, 1966 as amended to date.

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## 1.0 Introduction

The purpose of these criteria is 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. Objectives, principles and requirements are presented to assist the **Area** formulating plans and procedures to achieve desired results.

The definitions of terms in bold typeface can be found in the NPCC Reference Manual Document A-7, *NPCC Glossary of Terms*.

## 2.0 Objectives

The seven basic objectives in formulating plans related to **emergency** operating conditions are:

2.1 To avoid, to the extent possible, the interruption of service to **firm load**.

2.2 To minimize the occurrence of **system disturbances**.

2.3 To contain any **system disturbance** and limit its effects to the **Area** initially affected.

2.4 To minimize the effects of any **system disturbances** on customers.

2.5 To avoid damage to system **elements**.

2.6 To avoid hazard to the public by maintaining safe transmission line conductor clearances.

2.7 To be prepared for system restoration following a **system disturbance**.

## 3.0 Principles

Principles of operation, based on the foregoing objectives, are as follows:

3.1 **Bulk power system** facilities must not be removed from service without prior notification and coordination with adjacent **Areas**, except in an **emergency**, when time does not permit such coordination, or when immediate action is required to prevent hazard to the public, sustained customer service interruption, or damage to facilities. In such cases adjacent **Areas** shall be informed as soon as practical.

3.2 Each **Area** shall make every effort to always maintain total net **interchange** schedules. Each **Area** shall change schedules as needed to maintain **reliability**.

3.3 **Normal transfer capabilities** shall be observed unless there is insufficient **capacity** or voltage support in an **Area**, in which case **emergency transfer capabilities** may be used prior to shedding **firm load**. **Emergency transfer capabilities** shall not be exceeded.

3.4 Each **Area** shall maintain **automatic generation control** equipment operational and in service except as stipulated in Section 4.5.

3.5 Operations during an **emergency** must recognize the requirements to balance **load** and **generation**, including support of system frequency, as well as the requirement to maintain system **security**, including thermal, voltage and **stability** limitations.

3.6 A trending of voltage through normal maximum or minimum values is an indication of insufficient real or reactive control in an **Area**. The affected **Area** must quickly restore the **real** and **reactive power** balance between **load** and source.

3.7 If an **emergency** is being caused in whole or in part by parallel power flows, the **Area** or **Areas** contributing to parallel power flows shall take all steps, including the shedding of **firm load**, to eliminate the circulating power flow contribution to the **emergency** and the **Area** experiencing the **emergency** shall implement all steps up to and including the shedding of **firm load** in accordance with local or NERC line loading relief procedures.

3.8 When an affected **Area** within NPCC is unable to correct a situation, a request for assistance from an **Area** or systems outside NPCC shall be made. Upon receiving a request for assistance to mitigate an **emergency**, an **Area** shall provide maximum reasonable assistance to any other **Areas** or systems outside of NPCC and shall act within the time frame that such assistance is required (Note: Neighboring **Areas** will ensure suitable arrangements with the generating resources and / or transmission provider(s) in the **Area** are in place to be able to provide reasonable assistance.)

3.9 Reasonable assistance shall be requested only after comparable action(s) has been implemented by the requesting **Area**(s). Reasonable assistance shall normally consist of, in no implied order of priority:

3.9.1 Redispatching **generation** (may be subject to agreements).

3.9.2 Curtailing non-firm energy transfers to non-affected **Areas**

3.9.3 Arming **special protection systems**.

3.9.4 Purchasing **capacity** and energy on behalf of the **Area** experiencing the **emergency**.

3.9.5 Redistribution or sharing of **operating reserve**.

3.9.6 Shedding **interruptible load** where permitted by a power system's internal policy.

3.9.7 Implementing **voltage reduction**.

3.9.8 Loading facilities to their **emergency transfer capabilities** provided that adverse weather conditions do not prevent such assistance.

Reasonable assistance shall not normally require the shedding of **firm load**.

## 4.0 Requirements

In order to effectively adhere to the foregoing principles, each **Area** shall meet the following requirements:

### 4.1 Authority

Reliability Coordinators, **control area** operators, and **system operators** shall have the responsibility and authority to implement **emergency** procedures including the curtailment of transactions and / or shedding of **firm load**.

### 4.2 Metering & Indication

Accurate and reliable metering and indication of system frequency, breaker status, voltage levels and power flows (real and reactive for all **tie lines** and other critical **elements**) shall be available to the appropriate **system operator**(s).

### 4.3 Communication

Reliable inter-**Area** and intra-**Area** voice communications shall be available for the reliability coordinators, **control area** operators, and **system operators**, as appropriate to their accountabilities, with a reliability at least equivalent to that provided by a dedicated and redundant circuit.

### 4.4 Operating Limits

A comprehensive set of **operating limits** for inter-**Area** and critical intra-**Area interfaces**, recognizing both **normal** and **emergency transfer capabilities**, shall

be available to reliability coordinators, **control area** operators and **system operators** as appropriate to their accountabilities. The circumstances under which each of these transfer capabilities may be used shall be clearly indicated by written instructions.

For operation with facilities out of service, the comprehensive set of **operating limits** shall be supplemented by revised sets for planned outage conditions, by judgment of the reliability coordinators, **control area** operators and / or **system operator**, and by other studies as required.

4.5 Disabling Automatic Generation Controls

A sustained frequency excursion of ±0.2 Hertz is an indication of a major **load-generation** unbalance and possible formation of an **island**. It is important for the affected **Area** to reestablish a **load-generation** balance quickly, to restore frequency, and to allow **islands** to resynchronize as soon as possible. All **automatic generation controls** shall be removed from service at 59.8 Hertz on frequency decline and 60.2 Hertz on frequency increase.

4.6 Automatic Underfrequency Load Shedding

The intent of the Automatic Underfrequency Load Shedding program is to stabilize the system frequency in an **Area** during an event leading to declining frequency while recognizing the generation characteristics in each **Area**. The goal of the program is to arrest the system frequency decline and to return the frequency to at least 58.5 Hertz in ten seconds or less and to at least 59.5 Hertz in thirty seconds or less, for a generation deficiency of up to 25% of the load.

The Automatic Underfrequency Load Shedding Program must be coordinated among the NPCC Areas. Each Area is required to carry out the following unless an alternative plan is submitted by an Area for review by the NPCC Task Forces on Coordination of Operation and System Studies and approved by the NPCC Reliability Coordinating Committee:

4.6.1 Automatic **load shedding** of ten percent of its **load** at a nominal set point of 59.3 Hertz.

4.6.2 Automatic **load shedding** of an additional fifteen percent of its **load** at a nominal set point of 58.8 Hertz.

4.6.3 Underfrequency threshold **relays** shall be set to a nominal operating time of 0.30 second, from the time when frequency passes through the set point to the time of circuit breaker trip initiation (including any

communications time delay), when the rate of frequency decay is 0.2 Hertz per second.

Studies shall be performed by each **Area** to ensure satisfactory voltage and loading conditions after automatic **load shedding**.

4.7 Under-voltage

An **Area** may employ automatic under-voltage **load shedding** of selected **loads** to enhance power system **security**.

4.8 Manual Load Shedding

Each **Area** must be capable of manually shedding at least fifty percent of its **load** in ten minutes or less. Insofar as practical, the first half of the **load** shed manually should not include **load** which is part of any automatic **load shedding** plan (see Section 4.6).

Care should be taken that manual **load shedding** plans do not interrupt transmission paths. The plan should include the capability of shedding **load** proportionately over the whole system, but it must also recognize that operating requirements may limit shedding to one part of a system. An **Area** may require manual **load shedding** capability in excess of the minimum fifty percent.

Manual **load shedding** procedures should be reviewed at least annually by member companies, to ensure that the proper amount of **load** can be shed within the time limits prescribed.

Studies shall be performed by each **Area** to ensure that satisfactory voltage and loading conditions prevail after manual **load shedding**.

4.9 Generator Underfrequency Tripping

Generators should not be tripped for under-frequency conditions in the area above the curve in Figure 1.

It is recognized that, in special cases, requirements may dictate generator trip in the region above the curve. In those cases, automatic **load shedding** additional to the amount set out in Section 4.6, equivalent to the amount of **generation** to be tripped, must be provided. Such cases shall be reviewed by the Task Force on Coordination of Operation.

The intent of the added compensating **load shedding** is to preserve the **stability** of an **island**, if formed, and to avoid major underfrequency **load shedding** by the

**Area**, if it can be avoided. This can only be accomplished through a one to one correspondence of the **generation** lost and the immediate rejection of an equivalent neighboring **load**, at the frequency at which the given generator is tripped.

If the frequency decays below the curve shown in Figure 1, steps may be taken to protect generating equipment, including separation from the system with or without **load**. In such cases isolation onto a generator's own auxiliaries is preferred to facilitate rapid resynchronization as soon as system conditions permit. For time periods exceeding 300 seconds, actions such as those described in Sections 4.5 and 4.8 apply.

4.10 System Restoration

Each Area shall have a system restoration plan in accordance with NPCC Criteria, Guides and Procedures, and in conjunction with applicable NERC Operating Policies, Measures and Standards.

**System operators** shall be knowledgeable of the strategy, priorities and procedures for implementing their system restoration plan.

In addition, each **Area** shall maintain an inventory of **key facilities** and their **critical components** required for the energization of the **basic minimum power system**. Each **Area** shall include in the list of **key facilities** sufficient **blackstart capability** that is consistent with the strategy and priorities of their system restoration plan.

In the event of a system blackout or loss of AC supply, the prompt restoration of the power system depends on the successful operation of **critical components** associated with **key facilities**.

Testing of **critical components** associated with **key facilities** shall be performed at a frequency and for a duration that is sufficient to reasonably ensure that the **critical components** will function properly when isolated from all power sources not available during a partial or complete system blackout. As a minimum, this frequency and duration of testing is stated in Section 4.10.1. The four categories of **key facilities** subject to testing are:

- Blackstart generating stations
- Underground transmission cables
- Substation and Telecommunication sites
- Control Center and Telecommunication Center facilities

A facility owner / operator may request the **Area** and / or NPCC to consider an actual event as a completed test for the applicable period, provided it can be demonstrated that the operation of the facility during the event met the test objectives and performance criteria.

4.10.1 Testing requirements for **critical components** associated with **key facilities** (Reference: Table 1)

4.10.1.1 Blackstart generating unit startup (Reference: Table 1; Test BS-1)

All facilities designated as having **blackstart capability** shall have this capability tested annually without dependencies on power sources not available during a partial or complete system blackout. Once the facility has been started, it shall continue to demonstrate the capability by operating in a stable condition while isolated from the power system for a minimum of ten minutes. The number of units within a facility that shall be blackstarted for this test is determined by the **Area** as needed by the **Area's** system restoration plan.

All operating aids and auxiliary systems used in blackstarts, such as operations voice communications and system control and data acquisition (SCADA), shall be verified to operate adequately without dependency on the interconnected system or other unrelated unit support for any source of station service.

Transmission egress capability to deliver blackstart generation to the next substation shall be verified.

4.10.1.2 Backup pressurization system of underground transmission cables (Reference: Table 1; Test UG-1)

The back-up pressurization system of underground transmission cables that require a pressurized insulating medium to maintain dielectric strength shall be tested. This test shall be conducted every six (6) months by demonstrating that the required pressures can be maintained for a minimum of thirty (30) minutes. In all cases, the backup pressurizing system must be able to maintain required dielectric strength of the insulating medium for a time that is at least equal to the expected time required for restoration.

4.10.1.3 Substation and telecommunication backup power supplies-Batteries and generators (Reference: Table 1; Tests ST-1 to ST-6)

Backup power supplies in substations and telecommunication sites, which are deemed critical to system restoration, shall be tested as specified below. Where there are separate backup power arrangements at a site for substation equipment and telecommunication equipment they shall be separately identified in the critical components listing and shall be inspected and tested individually.

The required tests are as follows:

- Battery charger and batteries shall be inspected annually and meet owner / operator battery integrity standards. (Reference: Table 1; Test ST-1)

- Interruption of AC supply to a battery charger shall be carried out annually for a duration of no less than thirty (30) minutes to ensure a battery picks up and carries load. (Reference: Table 1; Test ST-2)

- Confirmation that essential loads at substation and telecommunication sites are supplied from battery charger and batteries shall be performed at least once every five (5) years for the time required to confirm critical loads are supplied by battery charger and batteries. (Reference: Table 1; Test ST-3)

- Performance testing of batteries in substations and telecommunication sites shall be done at least once every five (5) years. The test shall demonstrate that the batteries meet their design capability. The design capability of batteries must be consistent with the strategy and priorities of Area restoration plans. Discharge testing, or an equivalent procedure endorsed by a recognized standard setting organization, is acceptable. (Reference: Table 1; Test ST-4)

- For substations and telecommunication sites provided with backup power generators, a startup and run test shall be performed monthly for a minimum run time of fifteen

(15) minutes. In order to verify that the generators will pickup the required load during the loss of station service, a startup, transfer and run test simulating the loss of station service will be performed annually for a duration of at least thirty (30) minutes. (Reference: Table 1; Tests ST-5 and ST-6)

4.10.1.4 Control center and telecommunication center facilities (Reference: Table 1; Tests CC-1 to CC-7)

- Testing of facilities in control centers and telecommunication centers shall be performed in order to ensure the computer systems will be available when required for system restoration in blackstart situations. The uninterruptible power supply (UPS) systems in control centers and telecommunication centers shall be tested annually by interrupting AC supply and verifying that all critical loads are supplied for a time that is sufficient for backup power sources to restore the AC input to the UPS. (Reference: Table 1; Test CC-1)

- Performance testing of batteries in control centers and telecommunication center facilities shall be done at least once every five (5) years. The test shall demonstrate that the batteries will provide a minimum support time compatible with battery design capabilities. Discharge testing, or an equivalent procedure endorsed by a recognized standard setting organization, is acceptable. (Reference: Table 1; Test CC-2)

- For control centers and telecommunication centers provided with a backup power generator, a startup and run test shall be performed monthly for at least fifteen (15) minutes. In order to verify that the generators will pick up the required load during the loss of station service, a startup, transfer and run test simulating the loss of station service will be performed annually for a duration of at least thirty (30) minutes. (Reference: Table 1; Tests CC-3 and CC-4)

- Heating, Ventilation and Air Conditioning (HVAC) shall be assessed annually to demonstrate that ambient air temperature will be maintained within computer systems and telecommunication equipment working tolerances for at least the expected time required for restoration. If an

HVAC system relies on an external water supply for heat exchange purposes, the reliability of the external water supply during blackout conditions shall be considered. (Reference: Table 1; Test CC-5)

- Computer systems shall continue to function adequately during system disturbances, blackout and restoration conditions including situations where there are multiple status point changes and heavy alarm activities. Each Area shall test its computer redundancy features every six (6) months. Reliable computer system operation shall be confirmed by performing blackout like simulations and / or by verifying response to major system disturbances annually. (Reference: Table 1; Tests CC-6 and CC-7)

## 5.0 Operation During Abnormal Conditions

5.1 When an **Area** foresees, or is experiencing, abnormal operating conditions, appropriate measures, as stated in the NPCC *Procedures During Abnormal Operating Conditions*, shall be implemented.

5.2 Appropriate measures shall be taken to ensure that equipment critical to the security and restoration of the bulk power supply network is not affected by the interruption or degradation of the power system during abnormal conditions.

## 6.0 Responsibilities

6.1 All Reliability Coordinators, **Control Area operators**, facilities owners / operators and **system operators** are responsible for observing these criteria.

6.2 Each **Area** shall maintain records listing the identified **key facilities** and associated **critical components**. Each **Area** shall, annually, as scheduled by the NPCC Compliance Monitoring and Assessment Subcommittee, declare to NPCC that it has reviewed its list of **key facilities** and associated **critical components** and submit any revisions to NPCC.

6.3 Each facility owner / operator of **key facilities** containing **critical components** as identified by the **Area** shall complete the following:

6.3.1 Schedule and perform tests of **critical components** associated with **key facilities** in conformance with **Area** outage scheduling procedures and in accordance with Section 4.10.1.

6.3.2 Report to the **Area** as per the reporting and test procedures as prescribed in Table 1 and as scheduled by the NPCC Compliance Monitoring and Assessment Subcommittee. Within one month of the test completion, provide a written report outlining site location and date of test, test results, and, if required, list reasons for failure, remedial actions to be undertaken and date by which work is to be completed Subsequent retesting is to be carried out within the originally prescribed test interval.

6.3.3 As noted on Table 1, the failure of a test, or the failure of critical components associated with key facilities encountered outside of normal testing as directed by NPCC Document A-03, shall be reported to the **Area** promptly, not to exceed 24 hours, to ensure the **Area's** awareness of its exposure.

6.4 Each **Area** shall review reports submitted by its owner / operators and annually submit a declaration of compliance to NPCC, within sixty days of a request, for the previous calendar year. Each **Area** shall maintain records for the lesser of, three years or the testing interval, to facilitate random audits and ensure compliance to the testing program.

6.5 The monitoring of automatic underfrequency **load shedding** requirements (Section 4.6), the monitoring of manual **load shedding** requirements (Section 4.8), the monitoring of the requirements of underfrequency generator tripping (Section 4.9), the monitoring of each **Area's** system restoration plans (Section 4.10), the monitoring of each **Area's** inventory of **key facilities** and associated **critical components** required for setting up a basic minimum power system and the monitoring of the testing of **critical components** associated with **key facilities** (Section 4.10.1) will be carried out by the NPCC Compliance Monitoring and Assessment Subcommittee.

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|---|---|
| Lead Task Force: | NPCC Task Force on Coordination of Operation |
| Review frequency: | 3 Years |
| References: | *NPCC Procedures During Abnormal Operating Conditions (NPCC Document C-20)*<br><br>*NPCC Glossary of Terms (NPCC Document A-07)* |

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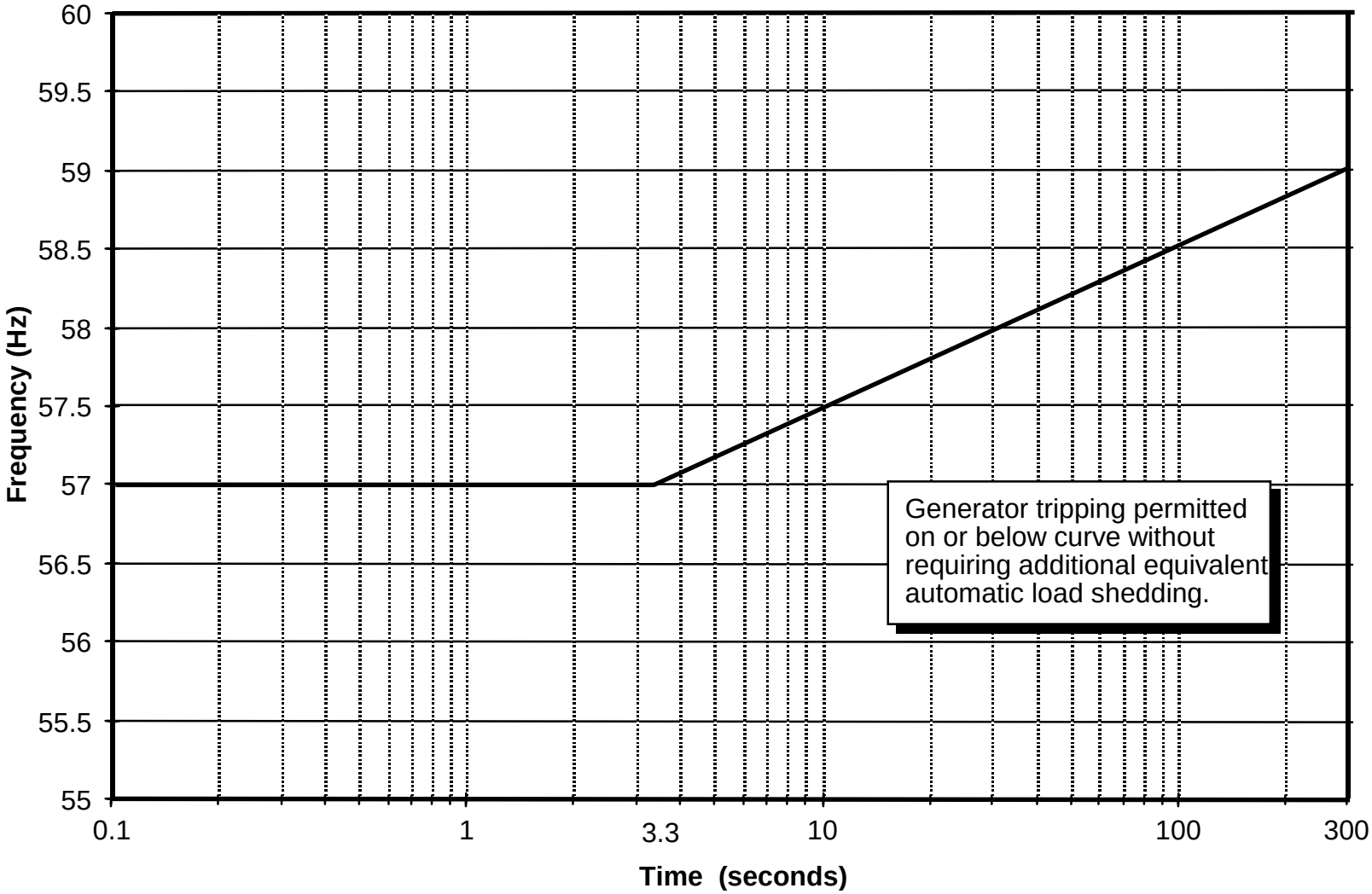
*NERC Operating Policy 5.E, Emergency Operation-System Restoration*

*NERC Operating Policy 6.D, Operations Planning-System Restoration*

**Figure 1 - Standards for setting underfrequency trip protection for generators**



| Table 1 - Standard Test Procedures for key facilities and associated critical components required for system restoration | | | | | |
|---|---|---|---|---|---|
| **Test No.** | **Critical Component** | **Test** | **Test Frequency and Duration** | **Criteria for Successful Test** | **Report by Facilities Owner / Operator to Area** |
| **BS-1** | Blackstart Generating Units | Startup test of generating unit **blackstart capability** without dependencies on the power system | Frequency: annually<br><br>Duration: 10 minutes of stable operation | -Successful startup and 10 minutes of stable operation<br>-All operating aids and auxiliary systems are independent.<br>-Transmission egress is verified | Refer to Section 6.3 |
| **UG-1** | Backup pressurization system of underground transmission cables | Test backup pressurization system by switching from normal to backup pressurization scheme | Frequency: every 6 months<br><br>Duration: minimum of 30 minutes; verify that backup pressurization system is able to maintain dielectric strength of insulating medium for the expected time required for restoration | - Backup maintains safe dielectric pressure for the minimum test period<br><br>- Backup pressurization system can maintain dielectric of insulating medium for the expected time required for system restoration | Refer to Section 6.3 |

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|---|---|---|---|---|---|
| **Test No.** | **Critical Component** | **Test** | **Test Frequency and Duration** | **Criteria for Successful Test** | **Report by Facilities Owner / Operator to Area** |
| **ST-1** | Battery charger and batteries in substation and telecommunication site | Check battery integrity as per owner / operator maintenance practices | Frequency: annually | Meet owner / operator battery integrity standards | No need to report to **Area**. |
| **ST-2** | Battery charger and batteries in substation and telecommunication site | Interruption of AC supplies to battery charger to ensure that battery picks up and carries load | Frequency: annually<br><br>Duration: for a test duration of no less than 30 minutes | Maintain acceptable voltage levels for the duration of the test | Refer to Section 6.3 |
| **ST-3** | Battery charger and batteries in substation and telecommunication site | Confirm critical loads are supplied from battery charger and batteries<br><br>If practicable, interruption of AC station service is preferred | Frequency: once every 5 years<br><br>Duration: time required to confirm critical loads are connected and supplied from charger and batteries | All critical loads are supplied from battery charger and batteries | Refer to Section 6.3 |

| Table 1 - Standard Test Procedures for key facilities and associated critical components required for system restoration | | | | | |
|---|---|---|---|---|---|
| **Test No.** | **Critical Component** | **Test** | **Test Frequency and Duration** | **Criteria for Successful Test** | **Report by Facilities Owner / Operator to Area** |
| **ST-4** | Batteries in substation and telecommunication site | Performance test of battery capacity | Frequency: at least once every five years<br><br>Duration: Discharge testing, or an equivalent testing procedure endorsed by a recognized standard setting organization, is acceptable | Battery capacity is adequate | Refer to Section 6.3 |
| **ST-5** | Backup generator in substation and telecommunication site | Startup and run test for backup generator | Frequency: monthly<br><br>Duration: minimum of 15 minutes | Successful startup followed by 15 minutes of stable operation | No need to report to **Area** |
| **ST-6** | Backup generator in substation and telecommunication site | Backup generator startup, transfer and run test to simulate loss of station service | Frequency: annually<br><br>Duration: minimum of 30 minutes | - Successful startup<br>- Transfer scheme operates correctly<br>- 30 minutes of stable operation supplying critical loads | Refer to Section 6.3 |

| Table 1 - Standard Test Procedures for key facilities and associated critical components required for system restoration | | | | | |
|---|---|---|---|---|---|
| **Test No.** | **Critical Component** | **Test** | **Test Frequency and Duration** | **Criteria for Successful Test** | **Report by Facilities Owner / Operator to Area** |
| **CC-1** | Uninterruptible power supply (UPS) system in control center and telecommunication center | Interruption of AC supply to UPS to ensure it can continue to support all critical loads | Frequency: annually<br><br>Duration: for a time that is sufficient for backup power sources to restore AC supply to the UPS | No impact on computer or telecommunication functions during testing | Refer to Section 6.3 |
| **CC-2** | Batteries in control center and telecommunication center | Performance test of battery capacity | Frequency: at least once every five years<br><br>Duration: for the time required to verify battery design capabilities<br><br>Discharge testing, or an equivalent testing procedure endorsed by a recognized standard setting organization, is acceptable | Battery capacity is adequate | Refer to Section 6.3 |

| Table 1 - Standard Test Procedures for key facilities and associated critical components required for system restoration | | | | | |
|---|---|---|---|---|---|
| **Test No.** | **Critical Component** | **Test** | **Test Frequency and Duration** | **Criteria for Successful Test** | **Report by Facilities Owner / Operator to Area** |
| **CC-3** | Backup generator in control center and telecommunication center | Startup and run test for backup generator | Frequency: monthly<br><br>Duration: minimum of 15 minutes | Successful startup followed by 15 minutes of stable operation | No need to report to **Area** |
| **CC-4** | Backup generator in control center and telecommunication center | Backup generator startup, transfer and run test to simulate loss of station service | Frequency: annually<br><br>Duration: minimum of 30 minutes | - Successful startup<br>- Transfer scheme operates correctly<br>- 30 minutes of stable operation supplying loads critical to system restoration<br>- When HVAC system restarts, ambient temperature is in the range of equipment working temperature | Refer to Section 6.3 |

| Table 1 - Standard Test Procedures for key facilities and associated critical components required for system restoration | | | | | |
|---|---|---|---|---|---|
| **Test No.** | **Critical Component** | **Test** | **Test Frequency and Duration** | **Criteria for Successful Test** | **Report by Facilities Owner / Operator to Area** |
| **CC-5** | Heating ventilation air conditioning (HVAC) system for control center and telecommunication center | Demonstrate that ambient air temperature will be maintained within computer system and telecommunication equipment tolerances for the expected duration of the restoration process | Frequency:<br>- for air exchange systems no special testing is required, only regular maintenance<br>- annually for water exchange systems<br><br>Duration: the expected duration of the restoration process (water exchange systems only) | - For air exchange systems: anomalies detected by the maintenance program were corrected<br>- For water exchange systems: water supply will remain viable and ambient temperature will be maintained in the range of equipment tolerances | For air exchange systems: written confirmation annual maintenance program was performed and that all anomalies detected were corrected<br><br>For water exchange systems: Refer to Section 6.3 |
| **CC-6** | Computer systems | Verify computer redundancy or (n-1) check by failing over the EMS | Redundancy check every 6 months | - No impact on computer functions during testing.<br>- Successful switching / testing without equipment failure. | Refer to Section 6.3 |

| Table 1 - Standard Test Procedures for key facilities and associated critical components required for system restoration | | | | | |
|---|---|---|---|---|---|
| **Test No.** | **Critical Component** | **Test** | **Test Frequency and Duration** | **Criteria for Successful Test** | **Report by Facilities Owner / Operator to Area** |
| **CC-7** | Computer systems | Verify computer processing capacity during blackout-like simulation or multiple status point changes and heavy alarm activities such as in a major system disturbance or blackout | Perform blackout-like simulations and / or verify computer response to major system disturbances annually | Computer systems performed adequately | Refer to Section 6.3 |