Policy 10 – Interconnected Operations Services

Draft 3.1

Policy Subsections

Definitions

The definitions provided in draft Policy 10 are for clarification purposes only. Once Policy 10 is approved, these definitions will be removed from the Policy and offered as revisions to the Glossary of Terms in the NERC Operating Manual.

BULK ELECTRIC SYSTEM. The aggregate of electric generating plants, transmission lines, and related equipment. The term may refer to those facilities within one electric utility, or within a group of utilities in which the transmission facilities are interconnected.

CONTINGENCY RESERVE. The provision of capacity deployed by the OPERATING AUTHORITY to reduce AREA CONTROL ERROR to meet the Disturbance Control Standard (DCS) and other NERC and Regional Reliability Council contingency requirements. CONTINGENCY RESERVES are composed of CONTINGENCY RESERVE–SPINNING and CONTINGENCY RESERVE–SUPPLEMENTAL.

CONTINGENCY RESERVE – SPINNING. The portion of CONTINGENCY RESERVE provided from IOS RESOURCES consisting of:

- Generation synchronized to the system and fully available to serve load within T_{DCS} minutes of the contingency event; or
- Load fully removable from the system within T_{DCS} minutes of the contingency event.

CONTINGENCY RESERVE – SUPPLEMENTAL. The portion of CONTINGENCY RESERVE provided from IOS RESOURCES consisting of:

- Generation (synchronized or capable of being synchronized to the system) that is fully available to serve load within T_{DCS} minutes of the contingency event; or
- Load fully removable from the system within T_{DCS} minutes of the contingency event.

CONTROL AREA. An electrical system bounded by interconnection (tie-line) metering and telemetry. It controls generation directly to maintain its interchange schedule with other CONTROL AREAS and contributes to frequency regulation of the INTERCONNECTION.

DEPLOY. To authorize the present and future status and loading of resources. Variations of the word used in Policy 10 include DEPLOYMENT and DEPLOYED.

DYNAMIC TRANSFER. The provision of the real-time monitoring, telemetering, computer software, hardware, communications, engineering, energy accounting (including inadvertent interchange), and administration required to electronically move all or a portion of the real energy services associated with a generator or load out of one CONTROL AREA into another.

FREQUENCY RESPONSE. The provision of capacity from IOS RESOURCES that deploys automatically to stabilize frequency following a significant or sustained frequency deviation on the INTERCONNECTION.

INTERCONNECTED OPERATIONS SERVICE (IOS). A service (exclusive of basic energy and transmission services) that is required to support the reliable operation of interconnected BULK ELECTRIC SYSTEMS.

INTERCONNECTION. Any one of the three major electric system networks in North America: Eastern, Western, and ERCOT.

IOS SUPPLIER. An entity that offers to provide, or provides, one or more IOS.

IOS RESOURCE. The physical element(s) of the electric system which is (are) capable of providing an IOS. Examples of an IOS RESOURCE may include one or more generating units, or a portion thereof, and controllable loads.

LOAD FOLLOWING. The provision of generation and load response capability, including capacity, energy, and MANEUVERABILITY, that is dispatched within a scheduling period by the OPERATING AUTHORITY.

MANEUVERABILITY. The ability of an IOS RESOURCE to change its real- or reactive-power output over time. MANEUVERABILITY is characterized by the ramp rate (e.g., MW/minute) of the IOS RESOURCE and, for REGULATION, its acceleration rate (e.g., MW/minute^2).

OPERATING AUTHORITY. An entity that:

1. Has ultimate accountability for a defined portion of the BULK ELECTRIC SYSTEM to meet one or more of three reliability objectives – generation/demand balance, transmission security, and/or emergency preparedness; and
2. Is accountable to NERC and one or more Regional Reliability Councils for complying with NERC and Regional Policies; and
3. Has the authority to control or direct the operation of generating resources, transmission facilities, or loads, to meet these Policies.

This new term approved by the NERC Operating Committee

OPERATING RESERVE. That capability above firm system demand required to provide REGULATION, load forecasting error, equipment forced and scheduled outages, and other capacity requirements.

REACTIVE POWER SUPPLY FROM GENERATION SOURCES. The provision of reactive capacity, reactive energy, and responsiveness from IOS RESOURCES, available to control voltages and support operation of the BULK ELECTRIC SYSTEM.

REGULATION. The provision of generation and load response capability, including capacity, energy, and MANEUVERABILITY, that responds to automatic controls issued by the OPERATING AUTHORITY.

SYSTEM BLACK START CAPABILITY. The provision of generating equipment that, following a system blackout, is able to: 1) start without an outside electrical supply; and 2) energize a defined portion of the transmission system. SYSTEM BLACK START CAPABILITY serves to provide an initial startup supply source for other system capacity as one part of a broader restoration process to re-energize the transmission system.

A. General Requirements

Introduction

INTERCONNECTED OPERATIONS SERVICES (IOS) are the fundamental physical capabilities or "building blocks", supplied by generation or load resources, needed to maintain the reliability of interconnected power systems in North America.

Section A specifies general requirements that are applicable for all IOS. These requirements establish a general framework of responsibilities for:

- Development of IOS specifications and metrics for certification and performance evaluation.
- The provision of IOS, including planning, aggregation, and deployment.
- Monitoring and verification of IOS.

Specific standards for each IOS are provided in the remaining sections of Policy 10. The standards throughout Policy 10 are grouped into two main subheadings according to the type of entity to which the standards apply: OPERATING AUTHORITY or IOS SUPPLIER.

Policy 10 stipulates that the required amounts of each IOS are contingent upon the characteristics of the regional or local BULK ELECTRIC SYSTEMS. Such specific regional or local requirements shall be developed through a process that is a) open to and inclusive of all market participants, and b) in accordance with the prevailing regional processes for standards development.

IOS SUPPLIER requirements apply to all IOS RESOURCES regardless of ownership.

Requirements – OPERATING AUTHORITY

1. **Provision of IOS.** The OPERATING AUTHORITY shall assure sufficient IOS are arranged, provided, and deployed to meet NERC, Regional Reliability Council, and local planning and operating standards.

2. **Specify IOS Requirements.** The OPERATING AUTHORITY shall determine IOS requirements through an open and inclusive process that is consistent with regulatory requirements, is coordinated at a regional level, includes market stakeholders, and allows for dispute resolution. Regional and local IOS requirements include but are not limited to:

2.1. The quantity, response time, duration, location and other criteria for each IOS as necessary to meet NERC, Regional Reliability Council, and local planning and operating standards.

2.2. Written procedures for the arrangement, provision, and deployment of IOS.

2.3. Metering requirements, consistent with established industry practices, for IOS RESOURCES .

2.4. Voice and data communication requirements associated with provision and delivery of IOS.

2.5. Transmission service requirements for delivery of each IOS.

3. **Changing System Conditions.** IOS requirements and procedures shall be adapted as necessary to maintain system reliability in response to current or expected system conditions.

4. **Publication of IOS Requirements.** The OPERATING AUTHORITY shall maintain publicly available documents specifying IOS requirements and procedures.

5. **Performance Verification.** The OPERATING AUTHORITY shall monitor the actual performance of IOS RESOURCES under normal and/or disturbance conditions to verify the IOS RESOURCE meets published performance criteria.

Requirements – IOS SUPPLIER

6. **IOS RESOURCE Capabilities.** An IOS SUPPLIER shall provide IOS RESOURCES which are:

6.1. Able to deliver the stated IOS capabilities to the BULK ELECTRIC SYSTEM.

6.2. Responsive to the instructions and controls of the OPERATING AUTHORITY, as specified for each IOS and consistent with previously agreed upon terms and conditions between the IOS SUPPLIER and OPERATING AUTHORITY.

7. **IOS RESOURCE Certification**. The capabilities of IOS RESOURCES shall be certified according to the defined minimum criteria.

8. **Metering.** An IOS SUPPLIER shall provide and maintain metering to measure IOS capabilities and performance, as specified by published IOS requirements.

9. **Voice and Data Communications.** An IOS SUPPLIER shall provide and maintain voice and data communications, as specified by published IOS requirements, to enable:

9.1. IOS RESOURCES to respond to the instructions or controls of the OPERATING AUTHORITY.

9.2. OPERATING AUTHORITIES to monitor the capabilities and verify the performance of IOS RESOURCES.

Proposed certification criteria are outlined in the accompanying White Paper on IOS Certification and Performance Measures. When Policy 10 is approved, Compliance Templates for IOS Certification Criteria and Performance Measures will be drafted for due process comment and approval.

10. **Provision of IOS.** An IOS SUPPLIER shall, as soon as practicable, notify the OPERATING AUTHORITY of any changes in the capability to provide the service or meet stated obligations.

11. **Performance Verification.** Upon request, an IOS SUPPLIER shall provide information to the OPERATING AUTHORITY necessary to verify performance, in accordance with published IOS requirements and procedures. All IOS SUPPLIERS, including OPERATING AUTHORITIES, which are IOS SUPPLIERS, shall maintain and provide verifiable data for certification purposes.

12. **Concurrent Commitment of IOS RESOURCES.** An IOS SUPPLIER may make concurrent commitments of an IOS RESOURCE's capability to provide IOS (for example providing recallable energy and CONTINGENCY RESERVE – SUPPLEMENTAL), if the following conditions are met:

12.1. The practice is disclosed, in advance, to the OPERATING AUTHORITY(IES) involved; and

12.2. The arrangements do not conflict with meeting the IOS SUPPLIER's obligations, nor the provision requirements of each concurrently committed IOS. For example, the same capacity for CONTINGENCY RESERVE may not be concurrently used for REGULATION.

B. Generation and Demand Balance

B.1 Regulation and Load Following

Requirements – OPERATING AUTHORITY

1. **Written Requirements.** The OPERATING AUTHORITY shall determine the IOS requirements for REGULATION and LOAD FOLLOWING in accordance with Requirement 2 of Section A. These requirements may include the amount, location, and response capabilities of IOS RESOURCES.

2. **Provision.** The OPERATING AUTHORITY shall assure sufficient REGULATION and LOAD FOLLOWING capabilities are arranged, provided, and deployed to meet NERC, applicable Regional Reliability Council, and local planning and operating standards.

3. **Deployment.** The OPERATING AUTHORITY shall direct the current and future loading of the portion of IOS RESOURCES providing REGULATION or LOAD FOLLOWING. Loading refers to the energy delivery of the IOS RESOURCE, within the operating constraints committed by the IOS SUPPLIER.

4. **IOS SUPPLIER Performance Monitoring.** The OPERATING AUTHORITY shall monitor the REGULATION and LOAD FOLLOWING performance of IOS SUPPLIERS. The OPERATING AUTHORITY shall maintain records of IOS SUPPLIER performance and data used to calculate performance.

Requirements – IOS SUPPLIER

5. **Declaration of REGULATION Response Capability.** An IOS SUPPLIER that has agreed to provide REGULATION shall declare to the OPERATING AUTHORITY the IOS RESOURCE's:

5.1. Maximum and minimum outputs that define the REGULATION range of the IOS RESOURCE**.**

5.2. MANEUVERABILITY characteristics including ramp up and ramp down limit, minimum time between requests for control changes, and maximum and minimum acceleration.

6. **Declaration of LOAD FOLLOWING Response Capability.** An IOS SUPPLIER providing LOAD FOLLOWING shall declare to the OPERATING AUTHORITY the IOS RESOURCE's:

6.1. Maximum and minimum outputs that define the LOAD FOLLOWING range of the IOS RESOURCE.

6.2. The ramp rate and acceleration of the IOS RESOURCE**.**

6.3. The minimum time period between requests for load changes.

7. **REGULATION Response.** An IOS RESOURCE that is offered to provide REGULATION shall automatically change the real power output in response to the controls supplied by the OPERATING AUTHORITY, subject to the agreed upon REGULATION capabilities of the IOS RESOURCE.

8. **LOAD FOLLOWING Response.** An IOS RESOURCE that is offered to provide LOAD FOLLOWING shall increase or decrease its real power output in response to instructions from the OPERATING AUTHORITY, subject to the agreed upon LOAD FOLLOWING capabilities of the IOS RESOURCE.

9. **Metering and Communication.** An IOS SUPPLIER offering to provide REGULATION or LOAD FOLLOWING shall meet the following minimum metering and communication requirements:

9.1. The IOS RESOURCE shall have an OPERATING AUTHORITY approved data communication service between the IOS RESOURCE control interface and the CONTROL AREA.

9.2. The IOS RESOURCE shall have an OPERATING AUTHORITY approved voice communication service to provide both primary and alternate voice communication between the OPERATING AUTHORITY and the operator controlling the IOS RESOURCE.

9.3. The IOS SUPPLIER shall provide to the OPERATING AUTHORITY real-time telemetry of the real power output of each IOS RESOURCE. The update frequency for REGULATION and LOAD FOLLOWING shall be in accordance with the requirements and guides in Operating Policy 1. The availability and reliability of the telecommunications shall comply with Operating Policy 7.

10. **REGULATION and LOAD FOLLOWING IOS RESOURCES Outside of the CONTROL AREA.** IOS SUPPLIERS providing REGULATION or LOAD FOLLOWING from IOS RESOURCES located in a CONTROL AREA other than the CONTROL AREA in which the load is physically connected, shall be controlled by a DYNAMIC TRANSFER.

B.2 Contingency Reserves

Requirements – OPERATING AUTHORITY

1. **Written Requirements.** The OPERATING AUTHORITY shall determine the IOS requirements for CONTINGENCY RESERVE – SPINNING, and CONTINGENCY RESERVE – SUPPLEMENTAL in accordance with Requirement 2 of Section A. These requirements may include the amount, location, and response characteristics, and the portion of CONTINGENCY RESERVE that must be SPINNING or SUPPLEMENTAL.

2. **Provision.** The OPERATING AUTHORITY shall assure sufficient capabilities for CONTINGENCY RESERVE – SPINNING and SUPPLEMENTAL are arranged, provided, and deployed to meet NERC, applicable Regional Reliability Council, and local operating requirements.

3. **CONTINGENCY RESERVE Dispersion.** CONTINGENCY RESERVES dispersion shall consider the effective use of capacity in an emergency, time required to be effective, transmission limitations, and local area requirements.

4. **Deployment of CONTINGENCY RESERVE – SPINNING AND SUPPLEMENTAL.** The OPERATING AUTHORITY shall direct the loading of IOS RESOURCES that provide CONTINGENCY RESERVE – SPINNING and SUPPLEMENTAL. The OPERATING AUTHORITY shall ensure deployment capability within the required recovery time from disturbance conditions (T_{DCS}) specified in Operating Policy 1. The OPERATING AUTHORITY shall ensure deployment of CONTINGENCY RESERVE is sustainable for a minimum of 30 minutes following the contingency event.

A variable, T_{DCS}, is introduced here to allow for changes to the recovery time requirements, i.e. a recent proposed change from 10 to 15 minutes.

5. **Verification of Performance.** The OPERATING AUTHORITY shall verify that all IOS RESOURCES requested to provide CONTINGENCY RESERVE – SPINNING, and SUPPLEMENTAL do so according to established performance criteria, including reaching the requested amount of real power output within and for the specified time limits.

6. **Restoration of CONTINGENCY RESERVE.** The OPERATING AUTHORITY shall develop clear operating plans and procedures to assure the timely deployment and restoration of CONTINGENCY RESERVE. These plans and procedures shall specify how CONTINGENCY RESERVE shall be restored, for example, how and when schedules are curtailed, replaced, or initiated.

Requirements – IOS SUPPLIER

7. **Declaration of CONTINGENCY RESERVE Capability.** An IOS SUPPLIER that has agreed to provide CONTINGENCY RESERVE shall declare to the OPERATING AUTHORITY the IOS RESOURCE'S capabilities.

8. **IOS RESOURCE Response.** An IOS RESOURCE offered to provide CONTINGENCY RESERVES shall be:

8.1. Responsive to the instructions and/or variable scheduled output supplied by the OPERATING AUTHORITY.

8.2. Continuously synchronized to the system, when providing CONTINGENCY RESERVES – SPINNING SERVICE.

8.3. Available for redeployment after the pre-arranged elapsed time as specified by the IOS SUPPLIER.

9. Provision of CONTINGENCY RESERVES. In response to the instructions of the OPERATING AUTHORITY, and subject to the declared capabilities of the IOS RESOURCE, the IOS RESOURCE shall:

9.1. Provide between 100% and the allowed overshoot of the stated amount (MW) of CONTINGENCY RESERVE – SPINNING within (T_{DCS} – X) minutes of a call by the OPERATING AUTHORITY requesting CONTINGENCY RESERVE. X is the number of minutes agreed to in advance by the OPERATING AUTHORITY and IOS SUPPLIER that allows for the OPERATING AUTHORITY to respond to a contingency and call for deployment of CONTINGENCY RESERVE.

9.2. Maintain between 100% and the allowed overshoot of the stated amount (MW) of CONTINGENCY RESERVE – SPINNING for at least 15 minutes subsequent to (T_{DCS} – X).

9.3. Return to the pre-contingency scheduled output (or consumption) +/– 10% of the requested amount of CONTINGENCY RESERVE, within ten minutes of instructions from the OPERATING AUTHORITY to do so.

10. Maintaining Reserve Capacity. An IOS SUPPLIER shall maintain the capacity committed to provide CONTINGENCY RESERVE throughout the commitment period.

11. Metering and Communication. An IOS SUPPLIER offering to provide CONTINGENCY RESERVE shall meet the following minimum metering and communication requirements:

11.1. The IOS SUPPLIER shall provide to the OPERATING AUTHORITY real-time telemetry of the real power output of each IOS RESOURCE providing CONTINGENCY RESERVE.

11.2. The IOS RESOURCE shall have an OPERATING AUTHORITY approved data communication service between the IOS RESOURCE control interface and the CONTROL AREA.

11.3. The IOS RESOURCE shall have an OPERATING AUTHORITY approved voice communication service to provide both primary and alternate voice communication between the OPERATING AUTHORITY and the operator controlling the IOS RESOURCE.

C. Reactive Power Supply from Generation Sources

Requirements – OPERATING AUTHORITY

IOS RESOURCE here refers only to those resources providing REACTIVE POWER SUPPLY FROM GENERATION SOURCES.

1. **Voltage Schedule Coordination.** The OPERATING AUTHORITY shall establish, and update as necessary, voltage schedules at points of integration of REACTIVE POWER SUPPLY FROM GENERATION SOURCES, to maintain system voltages within established limits and to avoid burdening neighboring systems. The OPERATING AUTHORITY shall communicate to the IOS SUPPLIER the desired voltage at the point of integration.

2. **Reactive Reserves.** The OPERATING AUTHORITY shall acquire, deploy, and continuously maintain reactive reserves from IOS RESOURCES, both leading and lagging, adequate to meet contingencies.

3. **Telemetry.** The OPERATING AUTHORITY shall monitor by telemetry the following data:

3.1. Transmission voltages.

3.2. Unit or IOS RESOURCE reactive power output.

3.3. Unit or IOS RESOURCE Automatic Voltage Regulator (AVR) status for units greater than 100 MW (and smaller units where an identified need exists).

4. **NERC Planning Standards.** The OPERATING AUTHORITY shall comply with NERC Planning Standards applicable to reactive power capability. These standards require that generation owners and OPERATING AUTHORITIES plan and test reactive power capability.

Requirements – IOS SUPPLIER

These standards apply to IOS RESOURCES that are providing REACTIVE POWER SUPPLY FROM GENERATION SOURCES.

5. **Automatic Voltage Regulator.** An IOS RESOURCE shall operate with the unit's AVR in use during the schedule period in which REACTIVE POWER SUPPLY FROM GENERATION SOURCES is provided, unless specifically directed to operate in manual mode by the OPERATING AUTHORITY, or a need to operate in manual mode is identified for emergency reasons by the IOS SUPPLIER. When the IOS SUPPLIER changes the mode, the IOS SUPPLIER shall promptly inform the OPERATING AUTHORITY.

6. **Response to Voltage or Reactive Power Schedule Changes.** IOS RESOURCES shall meet, within established tolerances, and respond to changes in the voltage or reactive power schedule established by the OPERATING AUTHORITY, subject to the stated IOS RESOURCE reactive and real power operating characteristic limits and voltage limits.

7. **Reactive Capacity.** IOS RESOURCES shall maintain stated reactive capacity, both leading and lagging. An IOS RESOURCE's stated lagging reactive capacity shall be supplied without interruption or degradation when subject to sudden and large voltage drops.

8. **Telemetry.** IOS RESOURCEs shall provide electronic transfer of real-time information to the OPERATING AUTHORITY:

8.1. Voltages at the IOS RESOURCE point of delivery to the OPERATING AUTHORITY.

8.2. IOS RESOURCE reactive power output, and

8.3. IOS RESOURCE AVR status for units of greater than 100 MW of nameplate capacity (and smaller units where an identified need exists).

D. Frequency Response

Requirements – OPERATING AUTHORITY

1. **Written Requirements.** The OPERATING AUTHORITY shall determine the IOS requirements for FREQUENCY RESPONSE in accordance with Requirement 2 of Section A. These requirements may include the amount, location, and response characteristics.

2. **Provision.** The OPERATING AUTHORITY shall assure sufficient capabilities for FREQUENCY RESPONSE are arranged, provided, and deployed to meet NERC, applicable Regional Reliability Council, and local operating requirements.

3. **Verification of Performance.** The OPERATING AUTHORITY shall verify that all IOS RESOURCES contracted to provide FREQUENCY RESPONSE do so according to established performance criteria, including reaching the requested amount of real power output within and for the specified time limits.

Requirements – IOS SUPPLIER

4. **Declaration of FREQUENCY RESPONSE Capability.** Prior to providing FREQUENCY RESPONSE, the IOS SUPPLIER shall declare the FREQUENCY RESPONSE capabilities of the IOS RESOURCES.

5. **Governor.** An IOS RESOURCE providing FREQUENCY RESPONSE capability shall maintain an operable governor system and shall be responsive to system frequency deviations.

6. **Maintaining FREQUENCY RESPONSE Capacity.** An IOS SUPPLIER shall maintain the governor response capability to provide FREQUENCY RESPONSE throughout the commitment period.

7. **Metering and Communication.** An IOS SUPPLIER offering to provide FREQUENCY RESPONSE shall have frequency metering and generation output metering sufficient to determine on an after the fact basis that the generator delivered the response required.

E. System Black Start Capability

Requirements – OPERATING AUTHORITY

1. **Restoration Plans.** The OPERATING AUTHORITY shall verify that restoration plans meet NERC, applicable Regional Reliability Council, and local requirements, and provide for adequate SYSTEM BLACK START CAPABILITY.

2. **System Black Start Requirements.** The OPERATING AUTHORITY shall determine the overall required amount and locations of SYSTEM BLACK START CAPABILITY in a system restoration plan for the coordinated re-energization of the transmission network following a total or partial system blackout.

3. **Training and Drills.** The OPERATING AUTHORITY shall include IOS RESOURCES providing SYSTEM BLACK START CAPABILITY in the conduct of system-wide training, and drills, as necessary to prepare a coordinated response to a partial or total system blackout condition.

4. **Provision of SYSTEM BLACK START CAPABILITY.** The OPERATING AUTHORITY shall ensure IOS RESOURCES for SYSTEM BLACK START CAPABILITY are arranged, provided, and deployed as necessary to reenergize the transmission network following a total or partial system blackout.

5. **Testing and Verification**. The OPERATING AUTHORITY shall schedule random testing or simulation, or both, to verify SYSTEM BLACK START CAPABILITY is operable according to the restoration plan. Testing and verification will be in accordance with established certification criteria. These tests and/or simulations shall ensure that the SYSTEM BLACK START resources and transmission system are configured such that the SYSTEM BLACK START CAPABILITY resources are able to energize the appropriate portions of the transmission system, and supply restoration power to the generator(s) or load(s), as required by the restoration plan. The SYSTEM BLACK START CAPABILITY resources must provide frequency and voltage within prescribed limits during line energization and remote load pickup.

6. **Performance Verification.** The OPERATING AUTHORITY shall verify the actual performance of SYSTEM BLACK START CAPABILITY resources in the event actual system blackout conditions occur.

Requirements – IOS SUPPLIER

7. **IOS RESOURCE Capabilities.** An IOS SUPPLIER of SYSTEM BLACK START CAPABILITY shall provide the following:

7.1. Capability to start a self-starting unit within a time specified, from an initial dead station and auxiliary bus condition. Alternately, a SYSTEM BLACK START RESOURCE may be a generating unit that is able to a) safely withstand the sudden and unplanned loss of synchronization with the BULK ELECTRIC SYSTEM and b) maintain generating capacity for a specified period of time.

7.2. Capability of re-energizing, within a time specified, the plant auxiliaries necessary to start one or more additional units, if the SYSTEM BLACK START CAPABILITY unit is planned as a cranking source for one or more of these additional units.

7.3. Capability of picking up external load within a specified time.

7.4. Stated MW capacity of the SYSTEM BLACK START CAPABILITY unit or units.

7.5. Capability of running the SYSTEM BLACK START CAPABILITY unit at stated MW capacity for a specified time from when the unit is started.

7.6. Frequency measurement at the SYSTEM BLACK START CAPABILITY unit to support the system restoration plan.

7.7. Frequency responsive capability to sustain scheduled frequency and remain stable during load pickup coordinated by the OPERATING AUTHORITY in accordance with the restoration plan.

7.8. Reactive supply and voltage control capability to maintain system voltage within emergency voltage limits over a range from no external load to full external load.

7.9. Participation in training and restoration drills coordinated by the OPERATING AUTHORITY.

7.10. Provision of voice and data communications with the OPERATING AUTHORITY, capable of operating without an external AC power supply for a specified time.