LUMA

Policy on Reserves

POLICY ON RESERVES

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POLICY ON RESERVES

1.0 Executive Summary

This document **shall** provide an overview of Electrical Generation Reserves and explain why reserves are important. It will name and define the types of Reserves, define each Reserve policy, and provide procedures for the System Operator to utilize reserves when changing or unexpected generation supply conditions potentially impact the Bulk Power System.

1.1 Overview of Electrical Generation Reserves

Electrical Generation Reserves are pre-identified Interconnected Generation Units or capacity that can be called into service to respond to system condition changes without impairing system safety, stability and reliability.

The Reserves are divided into 2 groups, Operating and Contingent, with the time required to supply power online being the main distinction. There are three types of Operating Reserves: Controlled, Spinning and Fast Start. All Operating Reserves are available to supply online generation within 10 minutes or less. The Contingent Reserves are available to supply online generation beginning at 10 minutes up to 30 minutes.

The Operating Reserve Policy is as follows:

- Controlled Reserves set to 300MW
- Spinning Reserves set to the largest online generation unit capacity
- 30% of the total online generation from North Area Generation Units

The Reserves discussed in this Policy are resources the System Operator utilizes to meet real time generation supply changes to the Daily Load Forecast to:

- Regulate system frequency (Controlled)
- Maintain system voltage (Controlled)
- Replace the loss of the largest online generation unit (Spinning)

- Add additional generation as System Load is approaching Peak Forecasted Load (Fast Start)
- Relieve fast start high-cost peaking generation units (Contingent)
- Relieve Spinning Reserve Units that were placed online to restore the Spinning Reserves capability (Contingent)

(See Appendix B – Policy on Reserves Flowchart and Appendix C – Calculations of Reserves for a graphic representation of this information.)

2.0 Objective/Scope/Roles

2.1 Objective

This procedure provides information and steps to effectively manage Electrical Generation Reserves that are approved by system operations. Electric Generation Reserves, including current reserve policies, are key factors for operating under a G-1, loss of a generating unit. The goal is to effectively manage Reserves to mitigate system instability which can cause problems such as personnel injury, damage to equipment, and customer outages.

This procedure **shall** enable system operations to schedule dependable Reserves to respond to a contingency without impairing system safety, stability and reliability.

2.2 Scope

This procedure outlines reserve policy requirements for Operating Reserves and Contingent Reserves. It defines the specific roles and responsibilities that allow for the execution of this procedure based on short term (0-3 years) horizon.

System operations establishes a reserve requirement. Future reserve requirements related to proposed interconnection of new renewable projects and utility scale batteries and the planned retirement of existing fossil interconnected facilities **shall** be adjusted per the Resource Adequacy Assessment Procedure.

2.3 Roles and Responsibilities

The following roles are essential to the effective management of Reserves:

2.3.1 Director System Operations (DSO)

Reviews a monthly report from system operations and takes any required steps to ensure system reliability.

2.3.2 Manager, Control Center Operations (MCCO)

The MCCO is responsible for the oversight of the Reserve Policies for system operations.

2.3.3 Manager, Energy Management (MEM)

The MEM is responsible for establishing and justifying reserve requirements and implementing this Policy on Reserves procedure.

2.3.4 Senior Shift Engineer (SSE)

- The SSE is responsible for providing operating system status updates prior to each shift
- Approves the daily list of scheduled Interconnected Generation Facilities developed by Shift Engineer (SE) based on the Peak Forecasted Load
- Prepares a detailed monthly report for the DSO. The report will show the number of reserve exceptions for each type of reserve.

2.3.5 Shift Engineer (SE)

- The SE reviews a daily report from each Interconnected Facility noting generation capability and a daily load forecast from the MEM
- Develop a daily schedule of Interconnected Generation Facilities based on the Interconnected Facilities Capabilities Procedure and the daily load forecast
- Prepares a pre-shift turnover with operating system status updates
- Check and review SCADA screens on hourly basis.
- Prepare a monthly report for the DSO.

2.3.6 Generation Facility Operator (GFO)

The GFO communicates in accordance with Interconnected Facilities Capabilities Procedure to allow for system operations personnel to implement this procedure.

2.3.7 GFO Back Up

The GFO Back Up is the Interconnected Facilities designated back up to the GFO.

3.0 Procedure

3.1 Overview

There are two types of Reserves outlined in this procedure document:

- **Operating Reserves** are reserves that can be online within 10 minutes. There are three types of Operating Reserves described in this procedure: Spinning, Controlled, and Fast Start.
- **Contingent Reserves** are reserves that can be online after 10 minutes and within thirty (30) minutes.

Control center operations sets the reserve set points and alarms in SCADA as described next in the reserve policy.

3.2 Reserve Policy

The MEM **shall** regularly review all electrical generation reserve requirements. The reserve set points and alarms in SCADA will include the following:

- The Controlled Reserves **shall** be set to a megawatt (MW) setting based on the ability to recover from frequency and voltage disruptions.
- The Spinning Reserves **shall** be set to the largest online generator unit capacity plus 25% of the largest online generation unit currently operating.
- 30% of the total online generation **shall** be from North Area Generation Units.

(See Appendix B – Policy on Reserves Procedure Flowchart and Appendix A3 – Calculations of Reserves for a representation of this information.)

3.3 Reserve Utilization

This document describes the following steps for utilizing Reserves effectively:

- Spinning Reserves
- Controlled Reserves
- Fast Start Reserves
- Contingent Reserves
- Reserve exceptions
- Policy on Reserves future considerations

3.3.1 Spinning Reserves

OVERVIEW

The SE receives an up-to-date daily report from each Interconnected Facility noting the Generation Capability of each unit and facility in accordance with the Interconnected Facilities Capabilities Procedure. (See Appendix E – Procedure Reference Matrix for a list of procedures related to this one.)

The SE receives a load forecast report in accordance with the Load Forecasting Procedure from the MEM with the daily load forecast for that day.

The SE refers to the Interconnected Facilities Capabilities Procedure and the Load Forecast Procedure and develops a schedule of Interconnected Generation Facilities with a set of planned reserves, as approved by the SSE, as follows.

- The SE requires Spinning Reserves equal to the largest Interconnected Generating Unit. At this setting if the largest Interconnected Generating Unit were to trip offline, the quantity of Spinning Reserves would be adequate to allow the electrical system to recover without other Generating Units needing to be commissioned/synchronized to the electrical grid for recovery.

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- The SE calculates whether the Spinning Reserves have been satisfied during every shift. The number of Spinning Reserves is entered into the system operations control room logbook. If the Spinning Reserves are less than the largest Interconnected Generation Facility, the SE notifies the MCCO of the deficiency and communicates with all Interconnected Generating Facilities to determine if additional Spinning Reserves are available and resets the system operations Spinning Reserves set points to conform with the system operations Outage Planning policy. Alternatively, the MCCO approves operating outside this Operating Reserves Procedure. It is not advisable to enter this condition close to peak load forecast within 2 hours before sunset as renewables typically come off-line at this time. Future Spinning Reserves requirements are addressed in the Resource Adequacy Planning Procedure.

SPINNING RESERVES

The SSE and SE **shall**:

- Perform pre-shift turnover with operating system and Electrical Generation Reserve status updates.
- Review SCADA screens and note the following:
  - Interconnected Facility units that are online
  - Online Interconnected Facility generation units used
  - System Load total in MW
  - System available capacity in MW
  - System calculated Spinning Reserves in MW
  - System calculated Controlled Reserves in MW
  - System Max. online capacity

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- Review the following SCADA screens:
  - Individual Unit data by Asset Classification such as Steam, Combined Cycle, Gas Turbines, Hydro, Cogeneration and Renewables
  - Individual Unit data includes Actual Generation, Maximum Capacity Limit, Available Capacity Mode and cost per kWh
- Perform the following tasks during the review:
  - Review daily load forecast per the Load Forecast Procedure.
  - Review the weekly load forecast per the Load Forecast Procedure.
  - Review the historical system generation data for similar date and time.
  - Determine the real time electric system overview condition.
  - Identify the largest Generation Unit Online to determine the current daily Spinning Reserves requirement.
  - Determine if the SCADA system Spinning Reserves amount is equal to the largest generation online amount.
- Calculate any shortfall amount in Spinning Reserve.
- Document any shortfall conditions in the control room logbook.
- Contact Interconnected Facility with online Spinning Reserves Units to see if there is capability to increase available generation capacity on their unit.
- Perform hourly comparisons between SCADA Spinning Reserves and hourly load forecasts to determine if any adjustments to Spinning Reserves are needed.
- Document adjustments based upon the hourly comparisons in the control room logbook. The Manager Control Center Operations **shall** manage the reserve exceptions.

3.3.2 Controlled Reserves

OVERVIEW

The MCCO sets Controlled Reserves at a megawatt level. The Controlled Reserves is the amount of Automatic Generator Control (AGC) capability available at any one time. It is calculated by adding the total amount of generation capability online less the amount of actual generation from these units and illustrated as follows:

Generation w/AGC Max - Generation w/AGC Actual = Generation Controlled Reserves

The online generation capacity that is devoted to providing the fast up and down balancing service controlled by the AGC. In this capacity, this generation is capable to increase output in response to a decline in frequency and decrease output in response to an increase in system frequency.

CONTROLLED RESERVES PROCEDURE

The SE and SSE have responsibilities for Controlled Reserves as follows:

- The SE and SSE **shall** perform pre-shift turnover with operating system status updates.
- The SE **shall** check and review SCADA screens for the following:
  - Online Interconnected Facility Units
  - Generation usage for online Interconnected Facility units
  - System Load total in MW
  - System Available Capacity in MW
  - System calculated Spinning Reserves in MW
  - System calculated Controlled Reserves in MW
  - System Maximum Online Capacity
  - Total amount of Controlled Reserves

- The SE **shall** check and review the SCADA screen noting the following:
  - Total MW under the Controlled Reserves heading
  - Generating Units ON REG (Units that are on automatic, AGC, regulation and their regulated MW)
- The SE **shall** note the following on the SCADA screen titled AGC:
  - Generating Units ON REG and the range of regulation for each unit
  - The amount of Controlled Reserves, which should add up to the preset Policy amount of 300 MW
- The SE **shall** perform an hourly SCADA Controlled Reserves comparison against hourly load forecasts to determine if any adjustments to Controlled Reserves are needed.
- The SE **shall** document adjustments based on hourly comparisons in the control room logbook.
- The MCCO **shall** manage the reserve exceptions.

3.3.3 Fast Start Reserves

OVERVIEW

Fast Start Reserves are units available to be placed online within 10 minutes. They are gas-fired, turbine peaking units ranging in capacity from 16MW to 77MW on the Bulk Power System (BPS).

The SE and SSE evaluate available Fast Start resources based on daily SCADA input. The MCCO establishes the amount of Fast Start Reserves available as Operating Reserve that can be utilized if the Spinning Reserves level at the time of a loss of the largest generation unit event not adequate to replace the loss. Additionally, Fast Start Reserves can be added online as System Load is approaching Peak Forecasted Load.

POLICY ON RESERVES

FAST START RESERVES PROCEDURE

The SE and SSE have responsibilities for Fast Start Reserves as follows:

- The SE **shall** perform pre-shift turnover using operating system and Electrical Generation Reserve status updates.
- The SE Shift **shall** check and review SCADA screens for the following:
  - Online Interconnected Facility Units
  - Online Interconnected Facility Unit's generation used
  - System Load total in MW
  - System Available Capacity in MW
  - System Spinning Reserves in MW
  - System Controlled Reserves in MW
  - System Max. Online Capacity
  - Unit Control – Gas Turbines
  - AGC Availability – Unit Summary
- The SE **shall** calculate if the Spinning Reserves alone are sufficient to replace the loss of the largest online generating Unit.
  - If yes, do nothing.
  - If no, calculate the amount of Fast Start Reserves units necessary to comply with the Policy.
  - If unable to comply with the policy, notify the supervisor.
- The SE **shall** document the amount of Fast Start Reserves and include any amount designated to replace the Spinning Reserves shortfall in the control room logbook.
- The MCCO **shall** manage the reserve exceptions.

3.3.4 Contingent Reserves

OVERVIEW

Contingent Reserves are the units that are available but not currently online. Contingent Reserves are calculated by subtracting Max. online Capacity and Fast Start Reserves from Available Capacity.

Contingent Reserves = Available Capacity – Max. online capacity – Fast Start Reserves

The longer start time generating units are typically used to relieve the Spinning Reserves that have been placed online during a contingency event. The goal when bringing the Contingent Reserves online is to restore the Operating Reserve (in this case, the Spinning Reserve) back to its pre-contingency or normal Spinning Reserves levels as defined in this procedure. Additionally, Contingent Reserves are also used to replace Fast Start Reserves when the Fast Start Reserves are used to supplement the Spinning Reserves and fulfill the required loss of largest generation Unit.

The Interconnected Facilities Capabilities Procedure **shall** provide all pertinent information on each interconnected generation facility to allow the Manager to develop daily, weekly, and long-term reserve plans.

The SE **shall** require all Interconnected Facilities to report their specific capabilities on a regular basis including but not limited to the following:

- Ramp rate
- Heat rate throughout dispatch curve
- Valid dispatch curve for interconnected facility throughout its full range of operation
- Cold, warm and hot start time
- Cost
- Fuel inventory

POLICY ON RESERVES

CONTINGENT RESERVES PROCEDURE

The SE shall do the following hourly:

- Check and review SCADA screens for the following:
  - Online Interconnected Facility units
  - Generation usage for online Interconnected Facility units
  - System Total Load in MW
  - System Available Capacity in MW
  - System Spinning Reserves in MW
  - System Controlled Reserves in MW
  - System Maximum Online Capacity
  - Unit Control – Gas Turbines
  - AGC Availability – Unit Summary
- Subtract the Maximum Capacity online and Fast Start Reserves from Available Capacity to determine available Contingent Reserves in MW.
- Perform a planning exercise for the worst-case scenario — that is, the loss of the largest generating unit.
- Utilize the AGC: Availability SCADA screen to determine units with available Generation Capacity but without Actual Generation. These units are the Contingent Reserves for the current day and time.
- Plan hypothetically which units should replace the Spinning Reserves MW that would be dispatched during the loss of the largest generation unit.
- Determine if Contingency Reserves meet policy requirements — that is, are equal to the largest unit online to restore the Spinning Reserves called up during the loss of the largest generation unit.

- Document the Contingent Reserves level in the control room logbook, noting any shortfall, if one exists. If a shortfall exists, the SE notifies the supervisor on duty. The MCCO manages reserve exceptions.
- Contact Interconnected Facilities with available but offline capacity Contingent Units to see if there is any capability to increase available generation capacity on their unit.

3.3.5 Reserve Exceptions

OVERVIEW

Recording and reporting Reserve exceptions documents the frequency, magnitude, and duration of instances when reserve levels are not maintained. This information is used to plan future Electrical Generation system enhancements.

RESERVE EXCEPTIONS PROCEDURE

The SE and SSE **shall**:

- Prepare a monthly control room logbook exception report by the fifth day of the following month. The report **shall** include the following:
  - Daily reserve exception statistics
  - Monthly statistics showing the total number of reserve exceptions for each type of reserve; the total duration of all summed exceptions in each type of reserve; the total number of days in the month that each reserve is in an exception condition.
  - Summary statement characterizing each reserve and the impact the exceptions had on SE and its ability to operate the BPS without impairing system safety, stability, and reliability.
- Submit the monthly report to the DSO.

Appendix A: Glossary

Term	Definition
Actual Generation	The output from a generator unit that is serving load. Term can also apply to the sum of all Interconnected Generator Units generation outputs.
Automatic Generator Control (AGC)	A computerized system that helps calculate the required parameters or changes to optimize the operation of generation units. The automatic generation control software uses real-time data such as frequency, actual generation, tie-line load flows, and the plant unit controller status to provide automatic electrical generation changes. SOP Definition: AGC is a system for adjusting the power output of multiple generators at different power plants in response to changes in the overall system load. AGC is used in real-time control to match the area generation changes to area load changes to keep frequency at nominal value. For successful operation of the power system, the load must be fed with constant voltage and frequency.
Available Capacity	The sum of all Interconnected Generation capacity currently available including online serving load, online but not under load, and offline but available to placed online within the designated start up time.
Contingent Reserve	The generation capacity that is available but not online. Contingent Reserves is used to relieve Spinning Reserves in the event of a loss of the largest online generating unit. Contingent Reserves is also used to relieve Fast Start Reserves. SOP definition: The synchronized and non-synchronized generation, available in a short period of time (30 minutes or less), to allow for the system to recover from either a unit trip, voltage event or frequency event. Some System Operators require contingency reserves equal to one-times the largest generator.
Contingent Units	The Interconnected Generation Facility (Interconnected Facility) units that have been designated for the current or daily operating shift as those available but not online generation units that **shall** act in a Contingent Reserves capacity.

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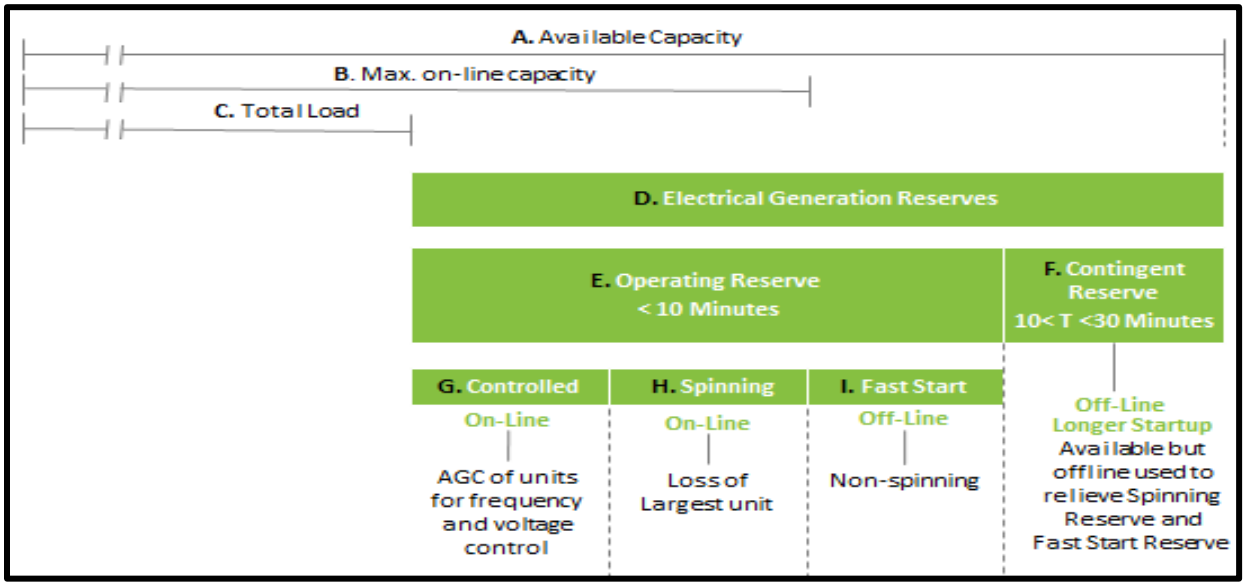
Term	Definition
Controlled Reserves	The online generation capacity that is devoted to providing the fast up and down balancing service controlled by the Automatic Generator Control (AGC). In this capacity, this generation is capable to increase output in response to a decline in frequency and decrease output in response to an increase in system frequency.
Electrical Generation Reserves	The combination of Operating Reserves and Contingent Reserves.
Fast Start Reserves	The generating units available to be placed online within 10 minutes. They are gas-fired turbine peaking units, currently ranging in capacity from 16MW to 77MW.
Future Operating Reserves	The generation needed as capable of supplying future Operating Reserve function capabilities, as identified by the Resource Adequacy Assessment Procedure.
High Operating Limit	The maximum generation level that a generator unit produces operating with Automatic Generation Control (AGC).
Interconnected Generation Unit	The system generating unit that is connected via transmission lines to the LUMA electrical grid.
Interconnected Generation Facility (Interconnected Facility)	The facility that contains or houses an interconnected generation unit.
Interconnected Facility	Interconnected Facility means any generation produces or energy storage facility that releases stored power to the bulk power system.
Reserve Policy	▪ Refers to specific policies related to LUMA Energy, Inc. procedures and policies related to Policies on Reserves included as a System Operations Principles Procedure.
Maximum Capacity Limit	The total online generation capacity of an Interconnected Generation Unit. This term displays as Max. Online Capacity on the AGC Unit Overview SCADA screen.
North Area Generation Units	The generation units in the following facilities: Cambalache, Palo Seco, San Juan, Vega Baja, and sometimes Mayaguez.

POLICY ON RESERVES

Term	Definition
On-Control	A term in SCADA indicating that the Generator Unit is controlled by the Automatic Generator Control.
On-Reg	A term in SCADA indicating that the Generator Unit is controlled by the Automatic Generator Control and which also allows the System Operator to have remote control.
Operating Reserve	The combination of Spinning Reserves, Controlled Reserves and Fast Start Reserves. All Operating Reserves are fully responsive within 10 minutes. SOP: Capacity that currently is not being used but that can be quickly available for the unexpected loss of generation.
Peak Forecasted Load	A daily report from the System Operations Study Department that forecasts the peak load for the daily period of the report per the Load Forecasting procedure.
SCADA	An acronym for the Supervisory Control and Data Acquisition computer system. It is a system of computer-aided tools used by operators of electric utility grids to monitor, control, and optimize the performance of the generation or transmission system.
Spinning Reserve	Spinning reserve is defined as unloaded generation that is rotating in synchronism with a utility-grid, i.e., the spinning generator is rotating at a speed that will produce power at precisely the same frequency as the frequency of the grid power. A generation load that is online, begins responding immediately, and is fully responsive within 10 minutes.
System Load	The total amount of MW being supplied by the Transmission System to serve all customers' electrical needs or load.
Unit	A single generator that may be part of a multiple-generator plant 's facility.

Appendix B: Policy on Reserves Procedure Flowchart



Appendix C: Calculations of Reserves

Electrical Generation Reserves = Available Capacity – Total Load
From Exhibit 1 **D = A - C**

Electrical Generation Reserves = Operating Reserves + Contingent Reserves
From Exhibit 1 **D = E + F**

Operating Reserves = Controlled Reserves + Spinning Reserves + Fast Start Reserves
From Exhibit 1 **E = G + H + I**

Electrical Generation Reserves = Controlled Reserves + Spinning Reserves + Fast Start Reserves + Contingent Reserves
From Exhibit 1 **D = G + H + I + F**

The Electrical Generation Reserves above are equivalent equations that utilize substitution expanding the definition of Electrical Generation Reserves.

Available Capacity = Total Load + Electrical Generation Reserves
From Exhibit 1 **A = C + D**

Electrical Generation Reserves = Operating Reserves + Contingent Reserves
From Exhibit 1 **D = E + F**

Available Capacity = Total Load + Operating Reserves + Contingent Reserves
From Exhibit 1 **A = C + E + F**

Therefore:

Contingent Reserves = Available Capacity - Total Load – Operating Reserves
From Exhibit 1 **F = A – C - E**

Spinning Reserves = Largest On-Line Interconnected Generation Unit Capacity
From Exhibit 1 & Operating Reserve Policy:
H = Largest On-Line Interconnected Generation Unit Capacity

Controlled Reserves = 300 MW
From Exhibit 1 & Operating Reserve Policy:
G = 300 MW

Fast Start Reserves = Total Amount of available but offline gas-fired turbine Interconnected Generation Units
From Exhibit 1 & Operating Reserve Policy:
I = Total Amount of Available but Offline Gas-Fired Turbine Interconnected Generation Units

Appendix D: Facilities

SOLAR FACILITIES

- AES Illumina (Guyama)
- Windmar (Ponce)
- Humacoa Solar Project (Humacoa)
- Horizon Energy (Salinas)
- Oriana Energy (Isabela)
- San Fermin (Loiza)

WIND FACILITIES

- Puna Lima Wind Farm (Naguabo)
- Pattern (Santa Isabel)

LANDFILL GAS

- Landfill Technologies (Fajardo)
- Landfill Technologies (Tao Baja)

OPERATING THERMAL GENERATION FACILITIES

- San Juan (San Juan)
- Palo Seco (Tao Baja)
- Costa Sur (Guayanilla)
- Aguirre (Salinas)

HYDROELECTRIC GENERATION FACILITIES:

- Caonillas
- Dos Bocas
- Garzas
- Rio Blanco
- Toro Negro
- Yauco

PEAKING FACILITIES

- Daguao (Ceiba)
- Aguirre (Salinas)
- Palo Seco (Tao Baja)
- Costa Sur (Guayanilla)
- Jobos (Guayama)
- Yabucoa (Humacao)
- Vega Baja (Vega Baja)
- Mayaguez (Mayaguez)
- Cambalache (Arecibo)

POWER PURCHASE AND OPERATING AGREEMENT FACILITIES

- AES (Salinas)
- Ecoelectrica (Guayanilla)

Appendix E: Procedure Cross-Reference Matrix

Procedure Reference Matrix, Part 1 of 2	Short Term Load Forecasting	New Facility Interconnection	Resource Adequacy Planning	Interconnected Facility Retirements	Legacy T&G Demarcation	Interconnected Facilities Capabilities	Black Start	Telemetry	Cybersecurity	Root Cause Analysis & Corrective Actions	Public Reporting	Performance Reporting	Stakeholder Management	Policy on Reserves
Short Term Load Forecasting														
New Facility Interconnection														
Resource Adequacy Planning														
Interconnected Facility Retirements														
Legacy T&G Demarcation														
Interconnected Facilities Capabilities														
Black Start														
Telemetry														
Cybersecurity														
Root Cause Analysis and Corrective Actions														
Public Reporting														
Performance Reporting														
Stakeholder Management														
Policy on Reserves						X								X
Reducing Risk Exposure to Contingencies														
Critical Loads														
Load Shedding														
Contingency and System Operating Limits Response														
Energy Dispatch, Scheduling and Merit Order														
Transmission Operations														
Plant Level Communications														
Balancing Frequency and Voltage														
Demand-Side Resources (Non-Wire Alternatives)														
System Operator Training														
Scheduling Planned T&G Outages														
Forced Outage														
Outage Execution and Closeout														
Emergency Response Execution														
Emergency Response Drills														

POLICY ON RESERVES

Procedure Reference Matrix, Part 2 of 2	Reducing Risk Exposure to Contingencies	Critical Loads	Load Shedding	Contingency & System Operating Limits Response	Energy Dispatch, Shedding & Merit Order	Transmission Operations	Plant Level Communications	Balancing Frequency & Voltage	Demand Side Resources (NWA)	System Operator Training	Scheduling Planned T&G Outages	Forced Outage	Outage Execution & Closeout	Emergency Response Execution	Emergency Response Drills
Short Term Load Forecasting															
New Facility Interconnection															
Resource Adequacy Planning															
Interconnected Facility Retirements															
Legacy T&G Demarcation															
Interconnected Facilities Capabilities															
Black Start															
Telemetry															
Cybersecurity															
Root Cause Analysis and Corrective Actions															
Public Reporting															
Performance Reporting															
Stakeholder Management															
Policy on Reserves															
Reducing Risk Exposure to Contingencies															
Critical Loads															
Load Shedding															
Contingency and System Operating Limits Response															
Energy Dispatch, Scheduling and Merit Order															
Transmission Operations															
Plant Level Communications															
Balancing Frequency and Voltage															
Demand-Side Resources (Non-Wire Alternatives)															
System Operator Training															
Scheduling Planned T&G Outages															
Forced Outage															
Outage Execution and Closeout															
Emergency Response Execution															
Emergency Response Drills															

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