LUMA

Legacy T&G Demarcation

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1.0 Executive Summary

This procedure defines the steps and requirements to set the demarcation plan for transmission and legacy generation units and specifies the delivery point where the care and custody of the electrical output of the PREPA Legacy units is defined and conveyed to the Bulk Power System. Further, this procedure defines the process which will be used to develop an agreement to operate and maintain certain transmission and generation assets associated with the demarcation.

2.0 Objectives/Scope/Roles

2.1 Objective

This procedure defines the process steps and the electrical and physical requirements to identify the demarcation point for each legacy power plant.

2.2 Scope

This Procedure only applies to existing PREPA Legacy units that are interconnected to the Bulk Power System and contains the requirements for the Transmission and Generation (T&G) demarcation and metering. See Appendix B for a list of facilities.

A team comprised of LUMA and PREPA representatives has been assembled and will implement the steps of this procedure immediately after commencement as described further in this document as Appendix D.

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2.3 Roles

A team has been assembled from LUMA and PREPA to perform the tasks in this procedure. The roles will be as follows:

- Demarcation Project Manager (DPM) **shall** represent LUMA and **shall** coordinate all activities and deliverables.
- An Engineer/Manager from System Operations **shall** ensure validity and safety of operations and assess the impact of demarcation-related tasks.
- Regulatory support staff to ensure the Interconnection Agreement, Operating Agreement and Plant Level communications are in place and to coordinate any required changes due to the demarcation efforts.
- Substation and meter technicians to assist the lead personnel to perform site visits, prepare assessments as well as perform tasks related to demarcation.
- Each Generation Plant Manager or their designated representative **shall** coordinate physical access and inspection of facilities. They are also responsible to approve all related plant modifications.

3.0 Procedure

3.1 General Requirements

3.1.1 Site Visits

LUMA's DPM has performed site visits and surveys for each power plant and reviewed the demarcation, the shared equipment and prepare work specifications for each power plant with plant personnel.

3.1.2 High-Accuracy Metering

LUMA **shall** install high-accuracy metering at each of the legacy power plant units. The documentation **shall** include a review of the existing current transformers (CTs) and potential transformers (PTs) and determine if they need to be replaced.

3.1.3 Equipment Labelling

LUMA **shall** physically tag or color-code all transmission equipment affected by this procedure.

3.1.4 Remote-control Interface

LUMA **shall** evaluate the need to add a new control cabinet close to the existing legacy plant Remote Terminal Unit (RTU) cabinet to facilitate a remote-control interface with Supervisory Control and Data Acquisition (SCADA) system.

3.1.5 Demarcation Work Specifications

The team **shall** define the scope and specifications for engineering, design, procurement, and installation required.

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3.2 Access

Genco **shall** grant unlimited and unrestricted access to LUMA and its personnel, contractors and third parties to perform the necessary works to install new metering, control, protection, and relay equipment facilitating the T&G demarcation and metering outlined in this procedure. LUMA **shall** make reasonable efforts to schedule and manage the work with Genco to not affect the Genco generating facilities' operation.

Appendix A: Glossary

Prudent Utility Practice	Refers to those practices, methods, and acts, that are commonly used by a significant portion of the geothermal powered electric generation industry in prudent engineering and operations to design and operate electric equipment (including geothermal powered facilities) lawfully and with safety, dependability, reliability, efficiency, and economy. Each may be amended from time to time, and all applicable Requirements of Law.
GRIDCO	An entity, which may be directly or indirectly owned by PREPA Holdco or an Affiliate of PREPA Holdco, that may acquire or obtain ownership of the T&D System after any potential reorganization of PREPA Holdco and to which PREPA Holdco may assign certain of its rights and obligations.
GENCO	A public limited liability company and governmental instrumentality of the Commonwealth of Puerto Rico, created by Act No. 164 of the Legislative Assembly of Puerto Rico, enacted on December 16, 2009, as amended, known as the “Puerto Rico General Corporations Act”

Appendix B: Legacy Power Plants and Units Under this Procedure

Number	Facility Name	Units
1	Aguirre Power Plant	ST 1
		ST 2
		CC STAG 1
		CC STAG 2
		ESST ST 1 & 2
2	Cambalache Power Plant	Unit 1
		Unit 2
		Unit 3
3	Costa Sur Power Plant	ST 5
		ST 6
		ESST for Unit 5
		ESST for Unit 6
		Unit 3
		Unit 4
		ESSTs for Units 3 & 4
		ESSTs for Units 1 & 2
4	Palo Seco Power Plant	ST 1
		ST 2/ ST-2 connected units
		ST 3
		ST 4
		CT 1-1 & 1-2
		CT 2-1 & 2-2
		CT 3-1 & 3-2
		ESST 1-2
		ESST 3-4
5	Mayaguez Power Plant	T 1/2
		T 3
		T 4
		ESST
6	San Juan Power Plant	ST 7
		ST 8

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Number	Facility Name	Units
		ST 9
		ST 10
		CC 5 (GT & ST)
		CC 6 (GT & ST)
		ESST Units 5 & 6
		ESST ST 7 & 8
		ESST ST 9 & 10
Peakers	**Facility Name**	**Units**
1	**Daguao**	**Unit 1**
		Unit 2
2	**Jobos**	**Unit 1**
		Unit 2
3	**Yabucoa**	**Unit 1**
		Unit 2
4	**Vega Baja**	**Unit 1**
		Unit 2
5	**Vieques**	**Unit 1**
		Unit 2
6	**Culebra**	**Unit 1**
		Unit 2
		Unit 3
Hydro	**Facility Name**	**Units**
10.5	**Toro Negro**	**Unit 1-1**
		Unit 1-2
		Unit 1-3
		Unit 1-4
		Unit 2
2	**Yauco**	**Unit 1**
		Unit 2-1
		Unit 2-2
3	**Garzas**	**Unit 1-1**
		Unit 1-2
		Unit 2

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Number	Facility Name	Units
4	Caonilas	Unit 1-1
		Unit 1-2
		Unit 2
5	Dos Bocas	Unit 1
		Unit 2
		Unit 3
6	Patilla	Unit 1-1
		Unit 1-2
7	Rio Blanco	Unit 1
		Unit 2

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Appendix C: Procedure Cross-Reference

Procedure Reference Matrix, Part 1 of 2	Load Forecasting	New Facility Interconnections	Resource Adequacy Assessments	Retirements	Legacy G&T Demarcation	Generator Capability	Black Start	Telemetry	Data/Cybersecurity	Root Cause & Lessons Learned	Public Reporting	Performance Reporting	Stakeholder Management	Policy on Reserve
Load Forecasting														
New Facility Interconnections														
Resource Adequacy Assessments														
Retirements														
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Generator Capability														
Black Start														
Telemetry														
Data/Cybersecurity														
Root Cause & Lessons Learned														
Public Reporting														
Performance Reporting														
Stakeholder Management														
Policy on Reserves														
Reducing Risk Exposure to Contingencies														
Critical Loads														
Loads Shedding														
Contingency & System Operating Limits														
Energy Dispatch, Scheduling & Merit Order														
Transmission Operations														
Plant Level Agreement														
Balancing Frequency & Voltage														
Demand-Side Resources														
Shift System Operator Training Requirements														
Scheduling Planned T&G Outages														
Forced Outage Response														
Outage Execution & Closeout														
Emergency Response Execution														

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Appendix D: Demarcation Plan

1. Objectives/Scope/Roles

1.1. Objective

This document defines the steps and the requirements to facilitate the demarcation for the PREPA legacy power plants. The demarcation plan includes description of the ultimate plant and unit specific Transmission-Generation (T-G) demarcation points, the tasks required to identify and tag critical GenCo/GridCo assets, existing metering status review and metering upgrade plans, review of protection, control and telecommunication infrastructure, and other plant/ unit specific equipment and systems, as deemed appropriate or necessary.

1.2. Scope

The Transmission and Generation (T&G) demarcation plan ONLY applies to existing PREPA GenCo Generating Facilities that are already interconnected to GridCo (LUMA) in Puerto Rico. See Appendix A for a list of GenCo plants/units that are in scope for this document.

This document follows the terms contained within the GenCo-GridCo Operating Agreement (GGOA) between the GenCo (PREPA generation facility) and LUMA (GridCo).

1.3. Methodology

During pre-commencement phase of LUMA, Sargent and Lundy (S&L) carried out a detailed investigation regarding the transmission and generation demarcation of PREPA legacy power plants. Upon site visits and discussions with PREPA and LUMA, S&L prepared a report detailing the demarcation points per plant/ unit. Additional recommendations were made regarding site access and security protocols, metering, control, protection and telecommunications. The report was reviewed both by PREPA and LUMA. Subsequently, a LUMA demarcation team has been formed and during July and August 2021, the team has performed subsequent site visits, inspected for the generation facilities and met with the plant managers and the plant's engineering staff to discuss and prepared a plant/ unit specific demarcation plan, as captured in this document. The plan presented in this document can be deemed as 'Phase 1' of the overall demarcation effort. Findings and progress in Phase 1 will serve as a basis for any follow-on demarcation activities.

1.4. Responsible Parties

The T&G Demarcation/ Interconnection team from GridCo (LUMA) is primarily composed of the T-G Demarcation Lead and LUMA staff from asset management and system operations. The Demarcation team from the GenCo (PREPA power plant) includes the Plant Manager, a Generator Facility Operator (GFO) or equivalent, who communicates with LUMA personnel to implement the plan and a Plant Operating Engineer, who provides responses to technical questions.

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Company	Title	Phone	Email
LUMA/ GridCo	Program Manager, T-G Demarcation		
LUMA/ GridCo	Program Manager, Capital Programs		
LUMA/ GridCo	Engineer	*TBD*	*TBD*
GenCo	Plant Manager	*TBD*	*TBD*
GenCo	Generator Facility Operator (GFO)	*TBD*	*TBD*
GenCo	Plant Operating Engineer	*TBD*	*TBD*

2. Demarcation Plan

2.1. Demarcation Team:

LUMA shall designate specific lead personnel and a supporting task force (comprised of Regulatory support, System Operations, substation and meter technicians, and asset management) who will ensure the steps of the T&G Demarcation Plan is being followed. GenCo shall designate engineers and operators who shall provide necessary information and review the demarcation tasks orders.

2.2. Site Visits:

LUMA shall perform site visits and surveys for each power plant to review the demarcation plan, the shared equipment and prepare work specifications per power plant.

2.3. Metering Upgrade: LUMA shall review the existing Legacy Power Plants' generating units meters and replace with high-accuracy meters along with the appropriate communication schemes with the system operator while utilizing the existing meter wiring to the best possible. LUMA shall document the replacement of existing metering with high-frequency metering at each of the legacy power plant units. The documentation shall include a review of the existing CTs and PTs and outline if there is a need to replace them.

2.4. Transmission and Shared Asset Identification, Maintenance and Operation: GenCo and LUMA shall maintain a list of (a) Transmission assets (serves only GridCo functions) and (b) shared equipment (may serve both GridCo and GenCo) that exist within the legacy power plants' physical boundaries. For both asset classes, Prudent Utility Practice shall be followed by both parties to ensure safe and reliable operation of the grid. Both parties shall evaluate the need for

and develop shared operating and maintenance arrangements on a case by case basis. For ease of operation and maintenance, LUMA shall physically tag or color all transmission equipment existing within the legacy power plants' physical boundaries. Work completed through further T-G Demarcation efforts may require updating the shared equipment list.

2.5. Physical/ Electrical/ Control Separation of GridCo Assets: LUMA shall evaluate the potential need to add a new control cabinet close to the existing legacy plant RTU cabinet to facilitate a remote-control interface as part of the transmission of SCADA. LUMA shall evaluate the need to physically relocate assets that serve GridCo functionalities. LUMA shall document the design, communicate any potential impacts and submit work orders to be reviewed by GenCo personnel.

2.6. Work Orders, Authorization and Contracts: LUMA shall submit a Work Order Form (see Appendix) to GenCo for Legacy Power Plant. GenCo shall review the Form and provide comments/questions within a two-week timeframe. Luma and GenCo shall agree/ disagree to proceed with the tasks specified in the Form within four weeks of the submittal date. LUMA shall issue an RFP for engineering, design, procurement, and installation and subsequently assign employees or select a third-party contractor(s) for completing the required demarcation tasks. The completed tasks are then to be documented and any direct/implied changes to the Shared Equipment List, Operating Agreement and Plant Level Agreement must be reported by writing.

3. Provisions

3.1

GenCo shall grant unlimited and unrestricted access to LUMA and its personnel, contractors and third parties to perform the necessary works to install new metering, control, protection and relay equipment facilitating the T&G demarcation and metering outlined in this Demarcation Plan. LUMA shall make reasonable efforts to schedule and manage the works with GenCo to not affect the GenCo Generating Facilities operation.

3.2 Disputes

The Parties shall attempt to resolve all disputes arising out of the T&G demarcation and Metering process according to the provisions outlined in the GGOA.

3.3 Confidentiality

Confidential Information shall mean any confidential and/or proprietary information provided by one Party to the other Party that is clearly marked or otherwise designated "Confidential." For purposes of this Procedure, all design, operating specifications, and metering data provided by the Interconnection Customer shall be deemed Confidential Information regardless of whether it is clearly marked or otherwise designated as such. The Parties shall maintain confidentiality and refer to the GGOA for clarifications on scope and best practices.

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