

**COMMONWEALTH OF PUERTO RICO  
PUBLIC SERVICE REGULATORY BOARD  
PUERTO RICO ENERGY BUREAU**

**NEPR**

**Received:**

**Mar 15, 2023**

**10:56 PM**

IN RE:  
LUMA'S RESPONSE TO HURRICANE  
FIONA

**CASE NO. NEPR-MI-2022-0003**

**SUBJECT: Motion Submitting Ninth Update on  
Stabilization Plan**

**MOTION SUBMITTING NINTH UPDATE ON STABILIZATION PLAN FOR  
TEMPORARY EMERGENCY GENERATION CAPACITY**

**TO THE HONORABLE PUERTO RICO ENERGY BUREAU:**

**COME NOW LUMA Energy, LLC** ("ManagementCo"), and **LUMA Energy ServCo, LLC** ("ServCo"), (jointly referred to as "LUMA"), and respectfully state the following:

1. In a Resolution and Order of October 7, 2022 ("October 7<sup>th</sup> Order") with the subject "Baseload Generation Dispatch Status-Post Hurricane Fiona," this honorable Puerto Rico Energy Bureau ("Energy Bureau") convened a Technical Conference to discuss concerns raised by LUMA in a letter dated October 6, 2022, regarding Resource Adequacy and potential Generation resource deficiencies following Hurricane Fiona. Per the October 7<sup>th</sup> Order, the topics to be discussed at the Technical Conference were "Dispatch Status of the available Baseload Generation post Hurricane Fiona and (ii) the identified temporary emergency mitigation measures thought to address the generation deficiencies arising from Hurricane Fiona."<sup>1</sup>

2. On October 12, 2022, the Energy Bureau entered a Resolution and Order whereby it ordered LUMA to develop a stabilization plan as a direct response to Hurricane Fiona, in coordination with the Federal Emergency Management Agency ("FEMA") and the Puerto Rico

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<sup>1</sup> The Technical Conference was held as scheduled on October 11, 2022. During the Technical Conference, the Energy Bureau and consultants for the Energy Bureau posed questions to LUMA's representatives.

Electric Power Authority (“PREPA”) “to address any baseload generation inadequacy or shortfall that affects the dispatch availability and has the potential to cause load shedding or a blackout event of the electric system (“Stabilization Plan”)” (“October 12<sup>th</sup> Order”).

3. Per the October 12<sup>th</sup> Order, LUMA was directed to submit the 1<sup>st</sup> and the 15<sup>th</sup> day of each month from the notice of the Order, an updated report addressing the efforts conducted by LUMA to assure the completion of the Stabilization Plan.

4. On October 27<sup>th</sup>, 2022, the Energy Bureau issued a Resolution and Order whereby it set a technical conference for November 1, 2022 (“October 27<sup>th</sup> Order”) in connection with the first update on the Stabilization Plan. The Energy Bureau stated that it is particularly interested in “learning about the (1) U.S. Army Corps of Engineers (“USACE”) Generation Assessment underway, (2) Emergency Temporary Generation under a potential FEMA Public Assistance Emergency assignment that can expeditiously mitigate the impact of Hurricane Fiona, and (3) Replacement of Emergency Temporary Generation that seeks to phase out the temporary generation with permanent capacity, noting that this permanent capacity is consistent with the approved Integrated Resource Plan (“IRP”).” *See* October 27<sup>th</sup> Order at page 1.

5. As per the October 27<sup>th</sup> Order, the Technical Conference was held as scheduled on November 1<sup>st</sup>. LUMA representatives appeared to discuss the Stabilization Plan and answered questions by this Energy Bureau.

6. On October 31<sup>st</sup>, 2022, LUMA submitted the First Update on the Stabilization Plan.

7. On November 15, 2022, LUMA submitted a Second Update on the Stabilization Plan (“Second Update”). In addition, LUMA submitted supplemental information to the Second Update arising from a joint press conference of November 15<sup>th</sup>, 2022, where the Governor of Puerto Rico, the Hon. Pedro Pierluisi and the Federal Coordinator for the Federal Emergency

Management Agency (“FEMA”), Nancy Casper, announced that FEMA’s power stabilization initiative aims to install between 600 to 700 MW of temporary emergency generation capacity through the mobilization of power generation maritime barges and temporary land-based generators. *See Supplemental Submission to Second Update on Stabilization Plan to Inform of Announcement by the Puerto Rico Government and FEMA on Temporary Emergency Generation Capacity*, filed on November 15, 2022.

8. On December 1<sup>st</sup>, 2022, LUMA submitted the Third Update on the Stabilization Plan.

9. The most recent updates to the Stabilization Plan were filed on January 17, 2023 (Fifth Update); January 31, 2023 (Sixth Update); February 14, 2023 (Seventh Update); and March 1, 2023 (Eight Update).

10. In compliance with the October 12<sup>th</sup> Order, LUMA hereby submits as *Exhibit 1*, the Ninth Update on the Stabilization Plan (“Ninth Update”). The Ninth Update includes, among others, a summary of the status of Stabilization Plan with reference to the tasks performed in the past weeks in coordination with USACE, FEMA and PREPA, as well as a summary of LUMA’s internal efforts. As slides 4 and 7 of *Exhibit 1* show, construction has commenced with progress at Palo Seco and Emergency Gensets, and other equipment are expected at Palo Seco by March 24<sup>th</sup>. Finally, the Ninth Update identifies current operational issues and concerns and provides an update on LUMA’s risk analyses, 90 days after Hurricane Fiona.

**WHEREFORE**, LUMA respectfully requests that this Energy Bureau **take notice** of the aforementioned, **accept** the Ninth Update submitted as **Exhibit 1** to this Motion, and **deem** that LUMA complied with that portion of the October 12th Order that requires submission of bi-monthly updated reports on the Stabilization Plan.

**RESPECTFULLY SUBMITTED.**

In San Juan, Puerto Rico, this 15<sup>th</sup> day of March, 2023

I hereby certify that this motion was filed using the electronic filing system of this Energy Bureau. I also certify that copy of this motion will be notified to the Puerto Rico Electric Power Authority, through its attorney of record: [jmarrero@diazvaz.law](mailto:jmarrero@diazvaz.law).



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*Exhibit 1*  
*Ninth Update on Stabilization Report*



# Generation Stabilization Plan Discussion

March 15, 2023

# Agenda

- I. Executive Summary
- II. Construction Activities
- III. Current Operations
- IV. Resource Adequacy Risk Analysis Summary



# Executive Summary

- **Construction has commenced and making progress at Palo Seco**
  - US Army Corps of Engineers (USACE) awarded generation installation contract to Weston Solutions, Inc. for generation installation and New Fortress Energy for fuel delivery
  - Site mobilization, required demolition and construction have begun
- **Emergency Gensets and other equipment are expected at Palo Seco by March 24**
  - Six primary gensets plus one spare genset and associated balance of plant equipment are being sourced from Arizona and Texas and currently enroute to Puerto Rico
  - LNG re-gasification equipment and a holding tank are being shipped from Nicaragua
- **Working to address transformer and underground pipe-cable concerns at San Juan**
  - PREPA's new, unused, transformer stored at San Juan is being evaluated and may solve the transformer issue problem
  - Examination is being done on the 115 kV buried cable to identify the root cause of the testing failure and establish a repair plan
- **US Environmental Protection Agency specified the generation emissions must meet New Source Performance Standards (NSPS) for NO<sub>x</sub> compliance (25 ppm)**
  - Several NO<sub>x</sub> control strategies are being evaluated by the USACE Project Delivery Team (PDT)



*Gensets ready to leave Yuma, AZ headed to Jacksonville, FL to be shipped to Palo Seco*



*Old pipe-cable insulating oil system tanks at San Juan*





# Active work at both primary sites

## Palo Seco – Making progress on construction

- Current mobilization and daily USACE Project Delivery Team meetings
- Demolishing buildings, tanks, and disposal of rubble to clear for generation equipment
- Off-site fabrication of piping
- Installation of cable tray supports and cable for Power Systems Safety Protection
- Foundation design for Liquified Natural Gas area and 90,000 gallon tank is complete.
  - Pile driving is scheduled to begin on 3/16
  - Scale of pile driving for tank is an installation schedule risk



*New cable trays being staged for assembly and installation at Palo Seco*

## San Juan – Working to address risks from old, damaged equipment

- Leaks at existing #10 transformer and damage of 115 kV underground pipe cable pose significant risk to installation
- LUMA and PREPA have been engaged in doing further testing and evaluation in order to resolve these risks



# Construction Coordination and Communication Activities

## Organizational Groups

- FEMA
- Task Force Leadership Team
- Operational Coordination Team
- Functional Teams and Subject Matter Experts
- Operations Support

- Contract awarded to Weston Solutions and construction activities have significantly increased
- USACE is leading the Integrated Project Delivery Team (PDT) meetings, seven days a week
- Besides USACE staff, the PDT meetings include others from FEMA, Weston Solutions, New Fortress Energy, PREPA and LUMA
- Many other ad hoc and scheduled meetings occur each week to deal with technical issues, e.g., electrical protection, equipment testing and electrical tie-in coordination.



# Construction Management

## Submittal Tacker

PROJECT SUBMITTAL STATUS - 03/09/23						
Number	Description	Date Submitted	PREPA	LUMA	Required	USACE/4025
001	AAPP - Site Verification	27-Feb-23	N/A	N/A	3/1/2023	Superseded
002	Work Plan	27-Feb-23	N/A	N/A	3/1/2023	3/9/2023
003	Accident Prevention Plan	28-Feb-23	N/A	N/A	3/1/2023	3/9/2023
004	Quality Control Plan	27-Feb-23	N/A	N/A	3/1/2023	3/9/2023
005	Security Plan	28-Feb-23	N/A	N/A	3/1/2023	3/9/2023
006	Transportation Plan (includes Subm 010)	3-Mar-23	N/A	N/A	3/9/2023	3/9/2023
007	Fueling Plan (ignot, LNG, Diesel tanks)	3-Mar-23	Needed	N/A	3/9/2023	
008 R1	Revised Site Layout Plan	2-Mar-23	3/5/2023	N/A		3/9/2023
009.1	P&ID Verification - Diesel	2-Mar-23	Needed	N/A		
009.2	P&ID Verification - LNG	2-Mar-23	Needed	N/A		
010	Land Based Transp. Plan (see 006)	2-Mar-23	N/A	N/A	3/9/2023	
011	Emergency Notification Plan	1-Mar-23	N/A	N/A	3/2/2023	3/9/2023
012	Power connection plan	See below	See below	See below	See below	
012.1	Power connection plan - Medium & Low Voltage Single Line	2-Mar-23	3/7/2023	N/A	3/5/2023	3/9/2023
012.2	Power connection plan - MV Cable Layout	2-Mar-23	3/7/2023	N/A	3/5/2023	3/9/2023
013	Grounding integration plan	2-Mar-23	Needed	3/5/2023		
014	Protective Relay Study					
015	Emergency Evacuation Plan	28-Feb-23	N/A	N/A	3/1/2023	3/1/2023
016	Site Preparation Plan	28-Feb-23	N/A	N/A	3/1/2023	3/9/2023
017	Commissioning Plan		FIO	FIO		
018	Operation and Maintenance Plan		FIO	FIO		
019	Hazardous Energy Control Plan	28-Feb-23	N/A	N/A	3/1/2023	3/1/2023
020	GenSet Synchronization		FIO	FIO		
021	Final Report		FIO	FIO		
022	Pre-Operation Analytical Sampling Summary		FIO	N/A		
023	Post-Operation Analytical Sampling Summary		FIO	N/A		
024	Air Permit Data		FIO	N/A		
025	As-Built Drawings		FIO	FIO		
026	Topographic Survey	3-Mar-23	FIO	FIO	3/9/2023	
27	Lead Testing Report	7-Mar-23	FIO	FIO	3/9/2023	
N/A: Not Applicable						
FIO: For Information Only						

MILESTONES			
	LUMA	AEE	TBD
EMERGENCY SERVICE TRANSFORMER SC 3/4			
GH SIDE	X		
TRANSPORTATION			X
SERVICE TRANSFORMER SJ 7			X
7/8			
	X		
		X	
ANCE TEST	X		
TEST		X	
CTION HS	X		
HS CABLE		X	X
ath			
REPORT DELIVER FOR THE OWNER	X		
KS		X	
SUPPLY OIL	X		
VACUUM AND OIL FILLING		X	
COMPLETE FULL ACCEPTANCE TESTS		X	
PIPE TYPE CABLE REPAIRS		X	
PIPE TYPE CABLE ACCEPTANCE TEST		X	
TEMPORARY OVERHEAD HS CABLE			X

## Division of Responsibility

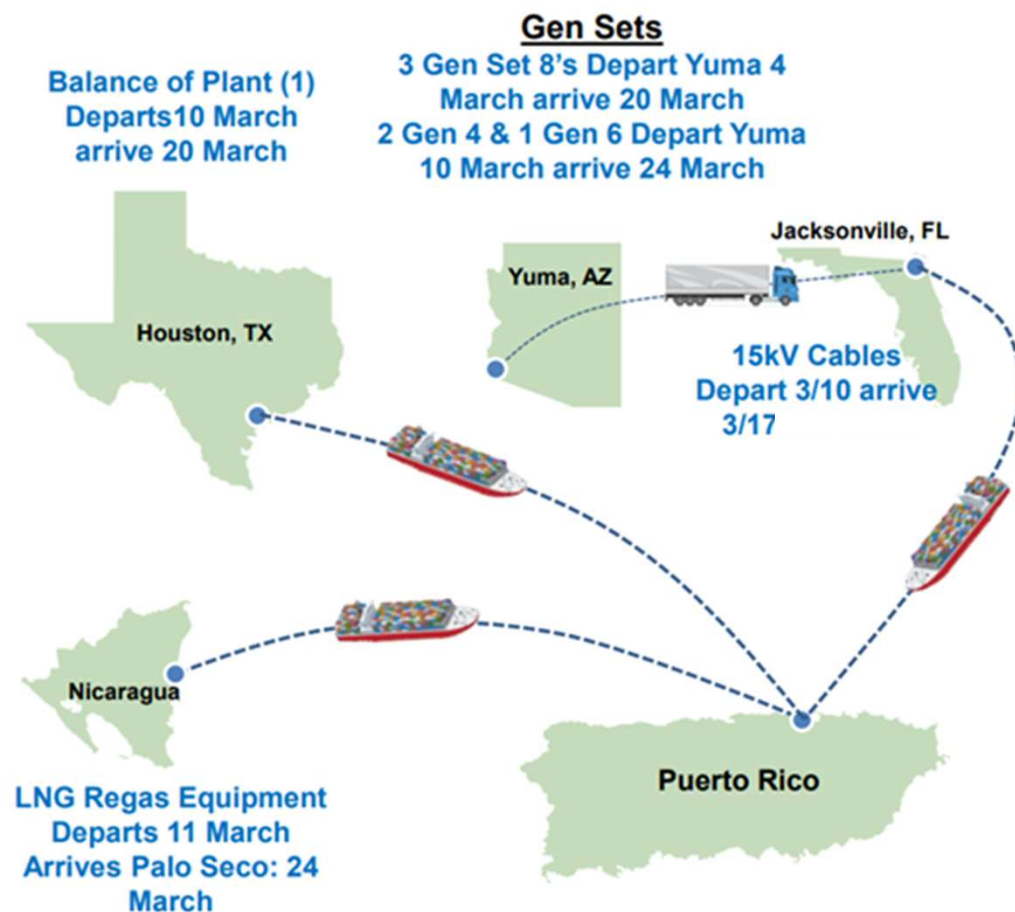
- Various weekly and daily integrated team meetings support the construction planning and control effort
- Close tracking of RFIs, Submittals, Approvals, Tasks and Schedules
- Security, Lighting, Accident Prevention, Quality Control and Ground Transport plans, including Ground Penetrating Radar (GPR) surveys are being completed now to prepare for arrival of equipment

## Transport Schedule

Gen 8 Movement as of 6 March 2023							
GT01							
Load#	Description	Truck#	Trailer#	Day 3 Start Location	Day 3 End Location	Miles Driven	Miles to Destination
9055730	Turbine Trailer	16964	TOWABLE	Somora, TX	Besumont, TX	445	804
9055731	Generator Trailer	9	TOWABLE	Somora, TX	Orange, TX	470	779
9055732	Control Trailer	80348	TOWABLE	Somora, TX	Buna, TX	443	806
				Comfort, TX	Opelousas, LA	449	677
				Junction, TX	Baytown, TX	328	867
GT02							
Day 3 Start Location	Day 3 End Location	Miles Driven	Miles to Destination				
El Paso, TX	Somora, TX	381	1250				8-Mar
Somora, TX	Orange, TX	470	779				8-Mar
El Paso, TX	Weimar, TX	657	974				8-Mar
Van Horn, TX	Baytown, TX	643	867				8-Mar
Wilcox, AZ	Somora, TX	656	1250				8-Mar
GT03							
Day 3 Start Location	Day 3 End Location	Miles Driven	Miles to Destination				
Sealy, TX	Mobile, AL	527	403				6-Mar
Somora, TX	Orange, TX	470	779				8-Mar
Deming, NM	Junction, TX	540	1193				8-Mar
Otrono, TX	Besumont, TX	480	804				8-Mar
Junction, TX	Vinton, LA	428	767				8-Mar
San Antonio, TX	San Antonio, TX	0	1079				8-Mar



# Logistics Activities



## Delivery of Major Equipment

Generation equipment is being sourced from various locations and on its way

### Palo Seco:

- Six- primary GE TM 2500 GenSets
- One - spare GE TM 2500 GenSet
- Balance of Plant equipment
- 15kV Cables
- LNG Re-gas Equipment

All on schedule and expected to be delivered to Palo Seco by 3/24

### San Juan:

Expect generators on site: 4/28



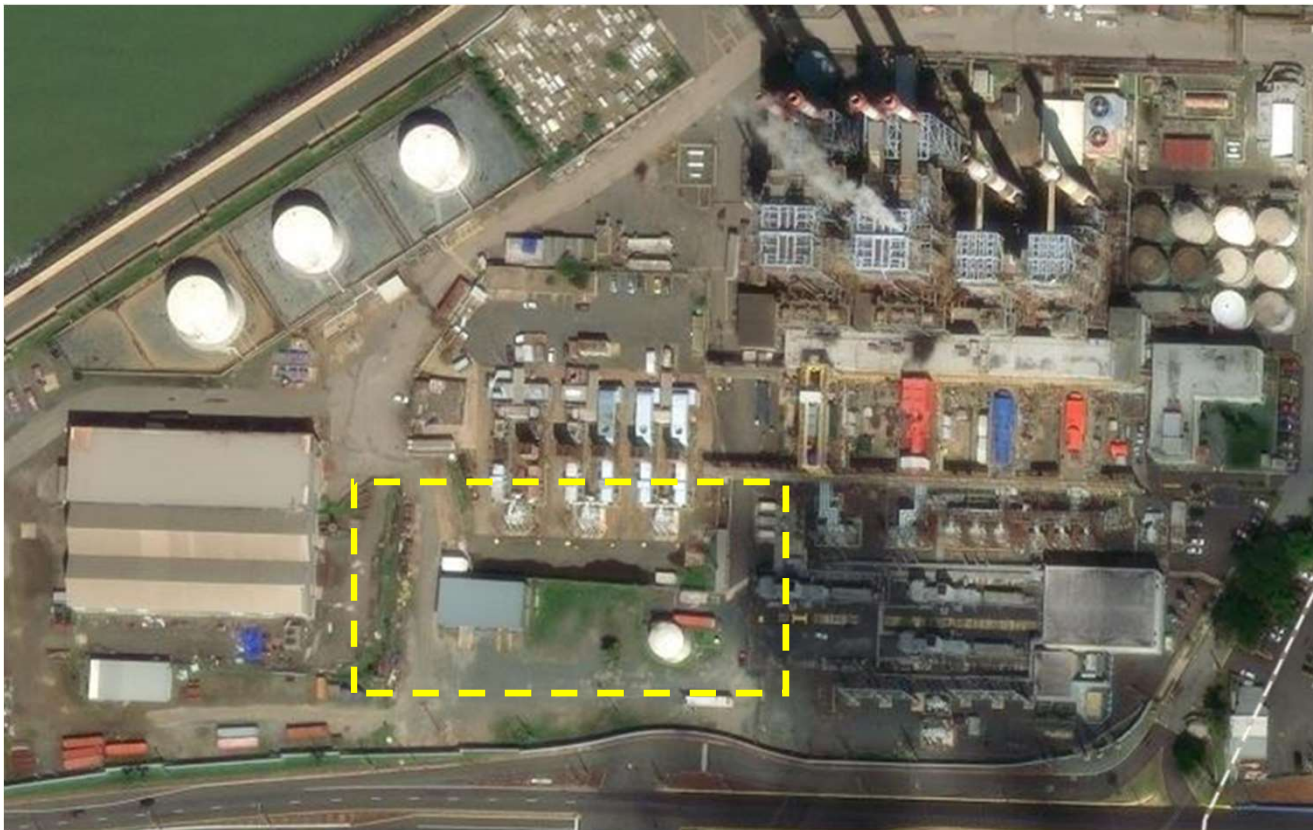
# LNG Equipment shipped from Nicaragua



- LNG skid and large volume (90k-gallon) tank to be placed at Palo Seco.
- Foundation requires 118, 60 foot concrete piles
- Equipment will be transported by truck seven miles from the Puerto Rico port to the construction site



## Overview of Palo Seco site and area for new generation



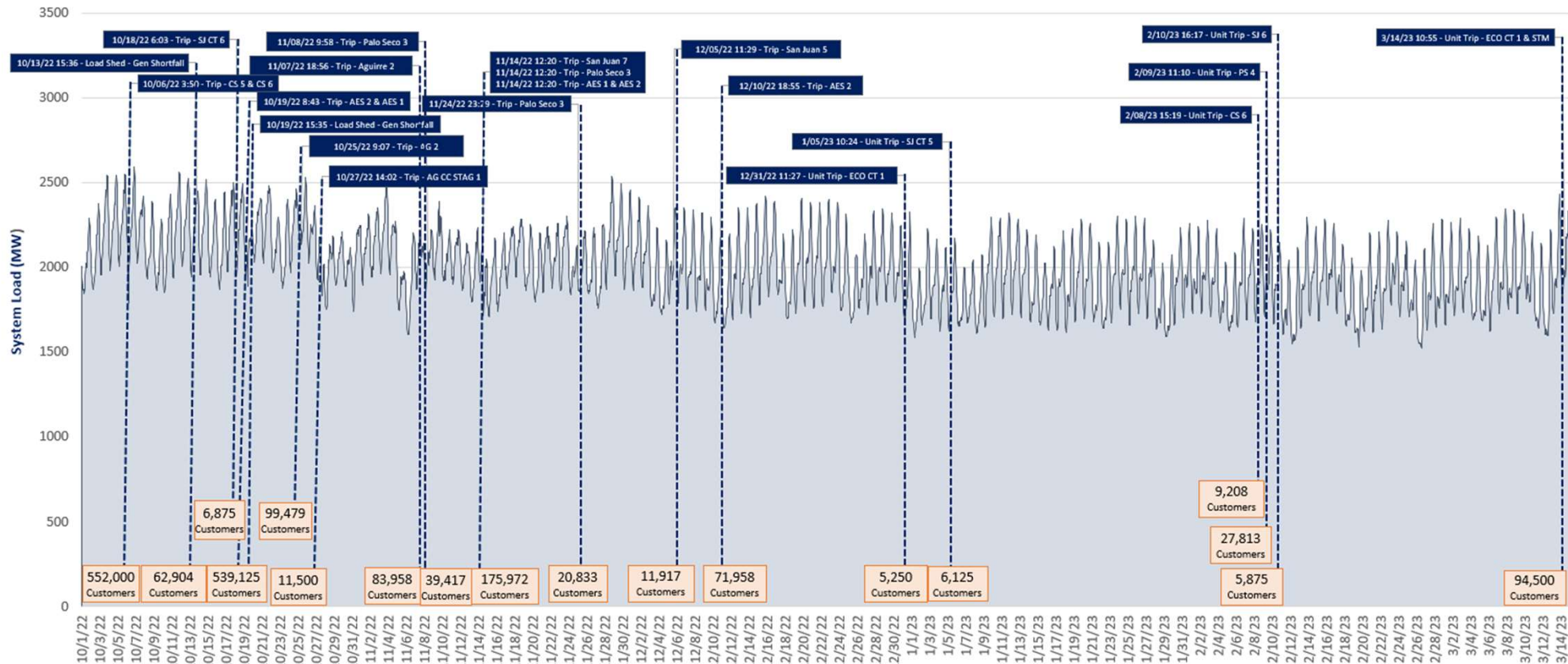
*Dashed yellow outline shows the area where the generation units will be installed*



# Current Generation Operations – Load Shed Events

Updated until 3/14/2023

Generation Load Shed Events



- Nineteen Load-Shed Events Have Occurred Since October 1, 2022
- One load shed event has occurred in the past two weeks.



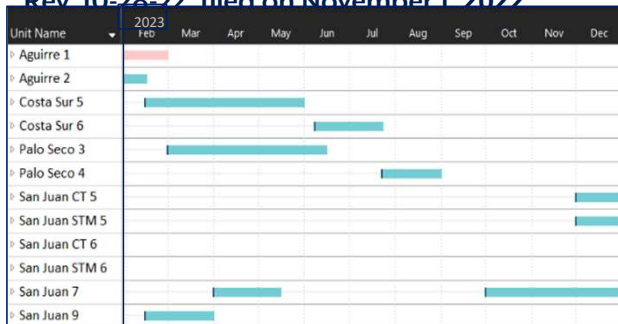
# Repeated changes to maintenance schedule limit effective planning of outage scheduling

## Planned Outage (PO) Schedule Changes for PREPA Units

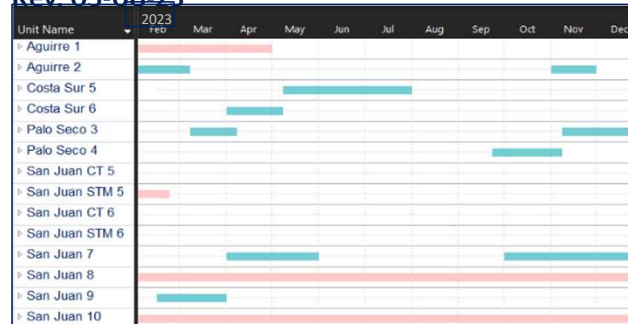
- Twenty-nine (29) Planned Outage schedules have been extended or delayed since October 2022

Schedule Revisions	Aguirre 1	Aguirre 2	Costa Sur 5	Costa Sur 6	Palo Seco 3	Palo Seco 4	San Juan CT 5	San Juan STM 5	San Juan CT 6	San Juan STM 6	San Juan 7	San Juan 8	San Juan 9	San Juan 10
Baseline Rev. 10-26-22														
Rev. 10-28-22								Extend PO				Add OOS through 2023		Add OOS through 2023
Rev. 12-08-22	Extend FO duration	Move up FO start	Delay PO start	Move up PO start	Delay PO start	Extend PO	Delay PO start	Extend PO duration			Delay PO start			
Rev. 01-05-23		Delay PO start	Move up PO start	Shorten PO duration		Delay PO Start	Add PO in Dec 2023	Extend PO duration						
Rev. 01-17-23		Add PO in Nov 2023									Extend PO duration	Change OOS to FO		Change OOS to FO
Rev. 02-06-23									Add PO in 2024	Add PO in 2024				
Rev. 02-24-23	Extend FO duration to end of Apr 2023.				Move up PO start date from Apr 2023 to Mar 2023 and shorten duration. Add PO in Nov 2023.		Add PO in Mar 2023. Delay PO start from Dec 2023 to May 2024.	Change PO in Feb to FO and extend duration. Delay PO start from Dec 2023 to May 2024.						
Rev. 03-08-23		Extend PO duration												

Rev. 10-28-22 filed on November 1, 2022



Rev. 03-08-23



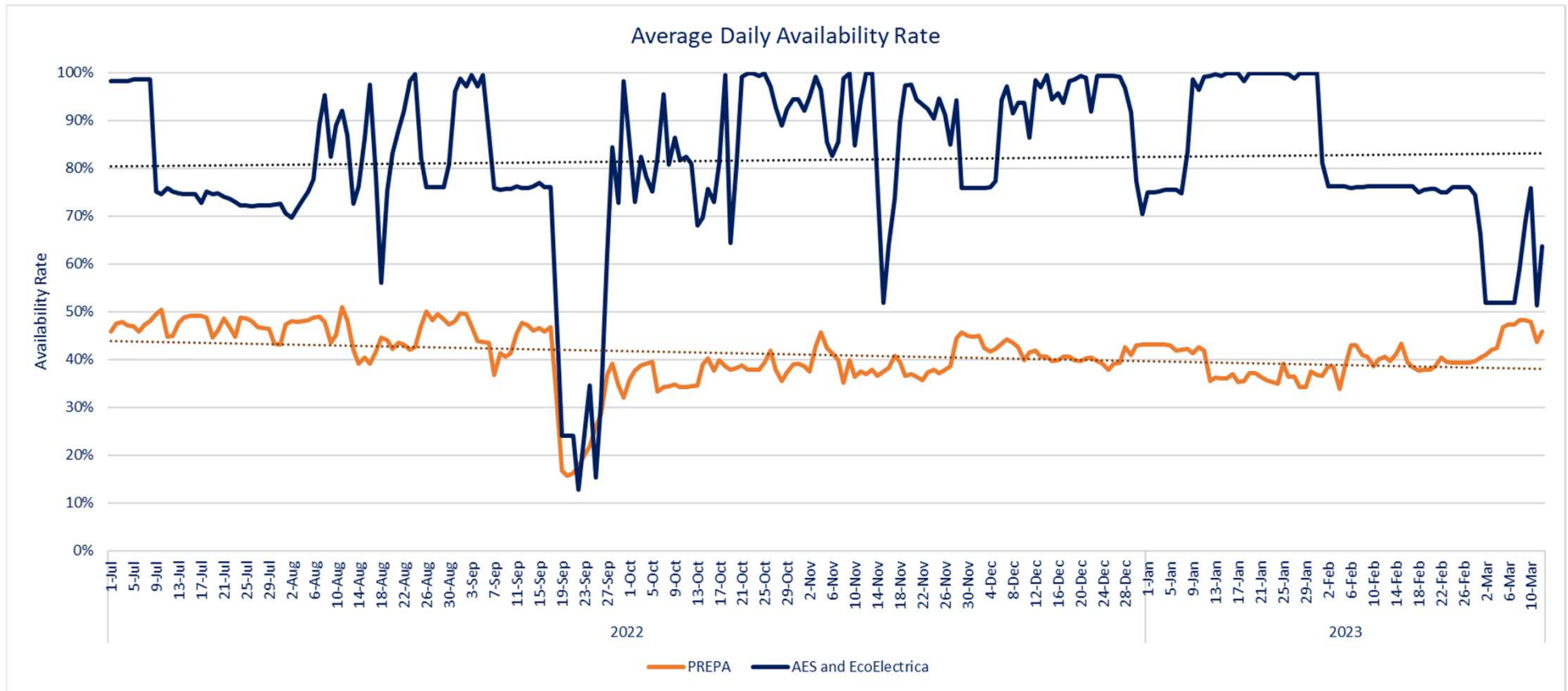
Forced  
Planned  
Outages





# Availability of PREPA units trending lower

As of 3/12/2023



- Since July of 2022, trend of availability of PREPA units decreased to below 40%, compared to its stated goal of 65%



## Resource Adequacy: continued risk with expected decrease when emergency generation is available

- Resource adequacy analysis suggest load shed risks will increase in coming months as demand grows due to rising temperatures
- Increased risk of load sheds in March to April time period
  - Failure to complete scope of maintenance work during planned duration
  - Increasing forced outage rates
  - Crowded outage schedule in March through May period
- Risks have been somewhat mitigated by lower-than-expected customer demand (on averaging 7% less than forecast) due to cooler than normal temperatures and customer shift to rooftop solar and net metering policy
- Near term arrival and interconnection of first 180 MW of FEMA emergency generation in April will reduce load shed risks considerably



# 350 MW of Emergency Generation reduces risk to Pre-Fiona Levels

Loss of Load Expectation is currently (LOLE) 37.2 for the period October 2023 – October 2024

- Several adjustments to outage schedules in October 2022 reduced outage events immediately after Fiona
- Reduced customer demand from original forecast has the effect of increasing reserves and reducing LOLE

The addition of 350 MW of emergency generation is calculated to reduce the LOLE down to 28.6

- Assumes half the emergency generation is connected in April and the other half connected in May

The addition of 350 MW of emergency generation restores the portfolio approximately to pre-Fiona risk levels

- LOLE pre-Fiona using historic availability data was approximately 28.1

