GOVERNMENT OF PUERTO RICO
PUERTO RICO PUBLIC SERVICE REGULATORY BOARD
PUERTO RICO ENERGY BUREAU

IN RE: *PLAN PRIORITARIO PARA LA ESTABILIZACIÓN DE LA RED ELÉCTRICA*	**CASE NO**.: NEPR-MI-2024-0005 **SUBJECT:** Requirement of Information

MOTION IN COMPLIANCE WITH THE DECEMBER 5TH ORDER

TO THE HONORABLE ENERGY BUREAU,

COMES NOW the Puerto Rico Electric Power Authority (hereinafter, *PREPA*) through its undersigned legal representation and, very respectfully, informs and requests as follows:

1. On June 13, 2024, the Energy Bureau of the Puerto Rico Public Service Regulatory Board ("Energy Bureau") issued a Resolution and Order ("June 13 Resolution") ordering PREPA, Genera PR, LLC ("Genera"), and LUMA Energy, LLC ("LUMA") to each develop an "aggressive preliminary plan of improvements to the electric system" ("Preliminary Plan") within a maximum implementation period of two (2) years.

2. In compliance with the Energy Bureau's order, LUMA as the operator of the transmission and distribution system, Genera as the operator of the legacy generation fleet and PREPA as the operator of the hydroelectric generation submitted proposed stabilization plans.

3. On December 5, 2024, the Energy Bureau issued a Resolution requiring LUMA, Genera, and PREPA to submit responses to a Requirement of

Information ("ROI") attached to the aforementioned order, as the Energy Bureau determined that additional information was necessary to conduct a thorough evaluation of the submitted stabilization plans.

4. In light of the above, PREPA submits its responses to the relevant portions of the ROI issued by the Energy Bureau as Exhibit A.

WHEREFORE, PREPA respectfully requests the Energy Bureau to: (1) take **NOTICE** of the present Motion; and (2) **DEEMS** PREPA in full compliance with the December 5th Order.

RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, this 21st day of December 2024.

CERTIFICATE OF SERVICE: We hereby certify that this document was filed with the Office of the Clerk of the Energy Bureau using its Electronic Filing System at https://radicacion.energia.pr.gov/login, and courtesy copies were sent via e-mail to LUMA Energy, LLC through its counsels of record at margarita.mercado@us.dlapiper.com, julian.angladapagan@us.dlapiper.com, laura.rozas@dlapiper.com, yahaira.delarosa@us.dlapiper.com and to Genera PR, LLC through its counsels of record at jfr@sbgblaw.com, alopez@sbgblaw.com.

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Exhibit A

NEPR-MI-2024-0005

SYSTEM STATUS AND PLANNED HAZARD MITIGATION ACTIVITIES

1. **On July 17, 2024, the Daily System Status received by the Energy Bureau depicted Toro Negro 1-3 unavailable due to a forced outage. However, PREPA states in the plan it submitted to the Energy Bureau on July 19, 2024, that this unit is available. Explain this discrepancy.**

   PREPA: According to the Plant's log, Toro Negro 1-3 remained available during that month. On July 17, 2024, was not forcibly removed from the system. There are instances when the unit cannot be in generation to prevent insufficiency of water in Aceitunas reservoir to the Puerto Rico Aqueduct and sewer Authority's (PRASA) filter plants.

2. **For each year, between 2020-2024, what was the forced outage rate of the available hydroelectric units?**

   PREPA: The hydroelectric units available between years 2020 to 2024 are Yauco 2-1 and 2-2; Garzas 1-1 and 1-2; Dos Bocas 2 and 3; and Toro Negro 1-1, 1-2 and 1-3. The forced outage rate for this period is:

Plant	FOH 2020	FOH 2021	FOH 2022	FOH 2023	FOH 2024
TORO NEGRO I (3 units)	5199	2184	0	0	0
GARZAS I (2 units)	4032	6960	8958	8958	0
YAUCO II (2 units)	6850	0	78	78	0
DOS BOCAS (3 units)	10464	12238	12058	12058	8784
Total FHO	**26545**	**21382**	**21094**	**21094**	**8784**
Total FHO %	**30%**	**24%**	**24%**	**24%**	**10%**

FHO: Forced Outage Hours 2024: until November 30th

3. **Should LUMA include the available hydroelectric units in its Resource Adequacy analysis presented to the Energy Bureau? Explain why.**

   PREPA: LUMA should include the availability of Hydroelectric Plants in its analysis. The hydroelectric units have a rapid response and can contribute to the system stability. In addition, LUMA is responsible for deciding which units enter or leave the system.

4. **Describe if the Garzas 2-1 unit is operational but unable to supply the grid due to the unavailability of a 38kV line.**

PREPA: The 38 kV transmission line, No. 1100, at Garzas plant No. 2 is damaged since hurricane Maria. Garzas 2-1 is mechanically available but cannot supply power to the grid because of the unavailability of the line. The Main Power Transformer (MPT) is deenergized due to the lack of an output line. PREPA is currently performing preliminary test runs in this unit.

5. **Describe what efforts are planned and/or underway to have the Yauco 1-1 hydroelectric unit operational? Describe the funding required and specify funding source, e.g., federal, non-federal. Describe the expected capacity that will result from these efforts. Describe when this capacity should be expected to be available to the system operator.**

   PREPA: The Yauco 1 powerhouse was constructed in 1956 and contains a single 25 MW, vertical six-jet Pelton type turbine generator unit. The unit has not operated since 2014 due to vibrations above 11 MW output. The mechanical governor, a mechanical-hydraulic cabinet actuator supplied by Woodward Governor Company, does not support automatic sequencing or change between one-needle and six-needle operation. The microwave is not in service, and the HSQ 2500 Series RTU lost remote monitoring and control functionality. Previously, the ECC could remotely start and stop the unit. Additionally, the Energy Control Center (ECC) remotely started the emergency generator. However, this functionality is no longer working. The facility retrofit will include an upgrade and digital conversion of the plant's mechanical system and upgrade of the electrical systems for improved efficiency, response, and resiliency.

   During 2023 and 2024, the Authority has been working on improvements to the physical plant and surroundings of the powerhouse, has made an inventory of the improvements that need to be made in the main components, has met with companies in the United States that specialize in units such as Yauco 1, and with the United States Corps of Engineers to rehabilitate it.

   The power house building needs an upgrade of windows, louvers and doors with hurricane wind resistant equipment that can adequately protect against windspeeds of 177 mph; the roof structure need repairs; turbine reverse engineering and upgraded with a variable flow system; replacement of the turbine runner, injectors, valves and bearings; turbine, protection, synchronization and communication control systems to be replaced with 21st century technology; turbine shaft and deflector reconditioning, mechanical and electrical auxiliary equipment, and main power transformer shall be replaced, among other components to restore the operation of this unit. The expected capacity resulting from these efforts is estimated to be 25 MW, with an improvement in efficiency and performance. The estimated cost is between $22M to $25M.

   Federal Emergency Management Agency (FEMA's) section 404 assigned $320.79 million for the refurbish and upgrades of legacy units installed in Puerto Rico Electric Power Authority (PREPA's) generation fleet in fifteen different sites across the island.

The Application Package HMGP-001966, under Disaster No. 4671, is awaiting FEMA approval. Yauco 1 is included.

The estimated timeline to complete the refurbish and upgrades is between twelve and sixteen months, depending in the long lead items.

6. **Describe how the availability of water can impair the ability of a hydroelectric unit to supply electricity. Describe how this availability has affected the generation output of the available hydroelectric units during the past 5 years.**

PREPA: Reservoir dredging and hydroelectric power projects, including repairs and retrofits of the hydroelectric power plants, are independent initiatives. The purpose of dredging sediment in the reservoirs is to restore the reservoir's volume capacity. The hydroelectric power project's purpose is to restore the ability to provide hydroelectric power generation. The dredging of the reservoirs will extend the duration of hydroelectric power generation. Priorities should be determined based on needs with an understanding that the dredging and hydroelectric repairs/retrofit are independent of one another.

The availability of water depends in the water level of the reservoir and is a factor to determine the hydroelectric generation capacity (kWh). Depending in the water levels, the operator of the electrical system will determine in advance at what period of the day and for how many hours the units will be in service.

The availability of water may impair the ability of the hydroelectric unit to supply electricity at some point when the water level jeopardizes water supply to Puerto Rico PRASA's filter plants. This kind of impairment has been experienced during the past 5 years in Toro Negro Plant No. 1, where the input water for PRASA's filter plant in Villalba is upstream the hydroelectric plant, at Aceitunas' reservoir.

PLANNED HAZARD MITIGATION ACTIVITIES

7. **Describe the status of the appeal presented by COR3 to FEMA on June 10, 2024 where it seeks reconsideration of the 120MW of hydroelectric generation hazard mitigation proposal under FEMA-4671-DR-PR. Describe to what extent would this 120MW of hydroelectric capacity help mitigate the automatic load sheds triggered by system underfrequency conditions.**

PREPA: FEMA denied the first Appeal presented on June 10, 2024. PREPA and COR3 joined forces with the United States Department of Energy (DOE) for the second Appeal. The COR3 submitted to FEMA the second Appeal on December 9, 2024.

The 120MW of hydroelectric capacity help mitigate the automatic load sheds triggered by system underfrequency conditions.

PREPA has implemented an underfrequency load shed mechanism that upon the frequency reaching certain levels below the nominal 60 Hz, increasing amounts of loads are shed until the frequency stops dropping (reaches a nadir) and start recovering. Underfrequency events are due to an imbalance between generation and load, i.e., the generation is not sufficient to cover the load, and the shortfall comes from the spinning energy of the units resulting in a progressive slowdown that if not addressed results in system collapse. Hydro units can provide fast primary frequency response (increases in generation as the frequency drops), provided that they have installed governors that enable this response and when the units are not operating at their peak capacity, as is normally the case. Note that the thermal units in the system and the storage, can also provide primary frequency response, but solar and wind generation normally can't unless they are being curtailed. The installation of fast governors is considered for the hydro units refurbish project awaiting FEMA approval.

8. The plan states that PREPA is contemplating the construction of new hydroelectric plants employing FEMA mitigation funds in the areas of Patillas and Guajataca.6

   a. Is the siting of these facilities guided by a need determination made by the system operator and justified by power flow characterization and modeling? Explain.

   b. Has this proposal secured approval from the Energy Bureau?

   PREPA: The siting of these facilities is not guided by a need determination made by the system operator nor justified by a power flow characterization and modeling.

   The construction of new hydroelectric plants in Patillas and Guajataca is in the conceptual phase. The idea of the proposed projects is taking advantage of the water flow and head available in the canals downstream the reservoir. These projects significantly enhance the safety and resilience of the surrounding communities. Ensuring these hydroelectric facilities can operate as microgrids during post-disaster scenarios and effectively mitigates risks.

9. **Document *Motion to Submit PREPA's June 2024 Update to the PREPA-LUMA 90-Day* Plan to the Puerto Rico Energy Bureau, in case NEPR-MI-2021-0002, June 21, 2024. PREPA submits information concerning the status of various hydroelectric system improvement projects that influence grid resiliency. It includes Table 1-1 – PREPA 2024 Q3 Project Submittal Milestone, with various FEMA FAASt Projects at different hydroelectric facilities (pages 11-12). The document also notes that "Grant formulation was completed for the Battery Energy Storage System (BESS) Project. This project has been submitted for Vivienda approval" (page 7).**

   a. Are any of the planned hydroelectric system improvements associated with the FEMA FAASt projects (included in Table 1.1) likely to result in an improvement in hydroelectric power plant capability (capacity or energy delivery) prior to December 2026?

PREPA: None of the planned hydroelectric system improvements associates with the FEMA Fast projects likely to result in an improvement in hydroelectric power plant capability prior to December 2026

b. Provide the timeline associated with expected changes to the hydroelectric system power plants after completion of work funded primarily through Federal Grant Management processes.

PREPA: The project is proposed to be completed in two distinct phases and is expected to take 156 weeks. All activities will be undertaken in compliance with all federal, commonwealth, and local regulations and requirements.

Phase One is expected to take 40 weeks and will include:

1. Procurement activities
2. Engineering studies and development of new data and analysis of all project locations.
3. Fabrication of engineering design plans
4. Development of opinion of probable costs
5. Refined cost-effectiveness determination
6. Initiating permits, coordination, and consultation
7. EHP impact statement and documentation
8. Updated project designs
9. Final scope of work and work schedule development

After Phase One, all identified deliverables will be submitted to COR3/FEMA for review and approval. Once COR3/FEMA approves deliverables, Phase Two will commence and is anticipated to take 116 weeks, pending required elements that are out of the sub-applicant's control, such as final permitting.

Phase Two will include all construction activities comprised of:

1. Approvals, procurement activities, permitting activities, and fees
2. Finalization of project design
3. Finalization of the opinion of probable costs
4. Ongoing coordination with any federal and commonwealth agencies (as required)
5. Construction activities in accordance with the final plans including, but not limited to, site work, mobilization, demolition, fabrication, installation of wind retrofit elements, upgraded hydroelectric equipment, demobilization, and electrical tie-in to the power grid.
6. Commissioning, testing, and inspections
7. Administrative closeout and financial reconciliation

c. Is PREPA aware of the potential timeline for completion of any BESS Project installations associated with the Energy Grid Rehabilitation and Reconstruction (ER-i) model projects (page 7)? If so, provide that information.

PREPA: PREPA is not aware of the potential timeline for completion of any BESS Project Installations associated with the Energy Grid Rehabilitation and Reconstruction (ER1) model projects. ER1 program is design to cover ten percent cost share of PREPA's FEMA projects under the FAAst.