

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

**IN RE:** REVIEW OF THE PUERTO RICO  
ELECTRIC POWER AUTHORITY'S 10-YEAR  
INFRASTRUCTURE PLAN – DECEMBER  
2020

**CASE NO.:** NEPR-MI-2021-0002

**SUBJECT:** Resolution and Order on Motion  
to Submit Fourth Group of Generation  
Projects.

**RESOLUTION AND ORDER**

**I. Introduction and Background**

On March 26, 2021, the Energy Bureau of the Puerto Rico Public Regulatory Board ("Energy Bureau") issued a Resolution and Order ("March 26 Resolution") through which it ordered the Puerto Rico Electric Power Authority ("PREPA") to submit each specific capital investment projects for approval, to avoid potential noncompliance with the Approved Integrated Resource Plan ("IRP") and Modified Action Plan ("Approved IRP")<sup>1,2</sup> The Energy Bureau required PREPA to submit the specific projects to the Energy Bureau for approval at least thirty (30) calendar days before their submittal to the Puerto Rico Central Office for Recovery, Reconstruction and Resiliency ("COR3") and the Federal Emergency Management Agency ("FEMA").<sup>3</sup>

On November 15, 2021, PREPA filed before the Energy Bureau a document titled *Motion to Submit Fourth Group of Generation Projects* ("November 15 Motion"). Through the November 15 Motion, PREPA submitted one hundred and four (104) Work descriptions. Such descriptions were included in Attachment A of the November 15 Motion, which contains a general description of works of conservation, repairs, and retrofitting of PREPA's generation units and their auxiliary equipment, including, without limitation, boilers, turbines, rotors, generators, motors, pumps, breakers, and control systems for their generation power plants.

The works are to be performed in the following sites: San Juan Power Plant, Aguirre Power Plant (Steam and Combined Cycle), Costa Sur Power Plant, Palo Seco Steam Plant, Hydrogas Turbine Peakers, Cambalache, Mayagüez Gas Turbines and a list of jobs to be performed at all power plants ("Proposed Generation Projects"). PREPA prepared a comprehensive list of repairs works projects of its generation assets for which PREPA will seek reimbursement under several FEMA programs (e.g., Section 428 Public Assistance).

On November 18, 2021, the Energy Bureau issued a Resolution and Order ("November 18 Resolution")<sup>4</sup> through which it stated that it would issue a resolution regarding the Proposed Generation Projects.<sup>5</sup> The Energy Bureau barred PREPA from executing further activities regarding the Proposed Generation Projects, provided however, that PREPA may execute those activities specifically covered in the generation budget approved by the Energy Bureau for Fiscal Year 2022.<sup>6</sup> The Energy Bureau indicated that most of the Proposed Generation

<sup>1</sup> See, *In Re: Review of the Integrated Resources Plan of the Puerto Rico Electric Power Authority*, Case. No. CEPR-AP-2018-0001, Final Resolution and Order, August 24, 2020 ("Approved IRP").

<sup>2</sup> See, *In Re: Review of the Puerto Rico Electric Power Authority's 10-Year Infrastructure Plan – December 2020*, Case. No. NEPR-MI-2021-0002, Resolution and Order, March 26, 2021. ("March 26 Resolution").

<sup>3</sup> March 26 Resolution, pp. 14-15. The Energy Bureau determined that this directive equally applies to LUMA Energy, LLC and LUMA Energy ServCo, LLC (collectively, "LUMA"). See, *In Re: Review of the Puerto Rico Electric Power Authority's 10-Year Infrastructure Plan – December 2020*, Case. No. NEPR-MI-2021-0002, Resolution and Order, June 8, 2021.

<sup>4</sup> On November 22, 2021, the Energy Bureau issued a Resolution and Order *Nunc Pro Tunc*.

<sup>5</sup> November 18 Resolution, p. 1.

<sup>6</sup> *Id.*, p. 2.



Projects entail capital and/or maintenance-related investments inconsistent with the Approved IRP and Modified Action Plan as well as PREPA's approved budget.<sup>7</sup>

On November 29, 2021, PREPA filed a document titled *Motion to Clarify and Request for Technical Hearing* ("November 29 Motion") in which PREPA addresses some statements made by the Energy Bureau in the November 18 Resolution. PREPA also requested a Technical Conference with the purpose of helping the Energy Bureau in its evaluation of the Proposed Generation Projects.<sup>8</sup> PREPA states that the November 15 Motion emphasizes on providing a safe and reliable electric service to the People of Puerto Rico, focusing on the existing generation assets availability and its effect on the power system reliability.<sup>9</sup> The November 29 Motion illustrates in a table format the recent generation forced outages and affected customers in the thousands.<sup>10</sup>

PREPA states in the November 29 Motion that the Proposed Generation Projects consists of repairs works needed to increase the current dependable available generation and provide a reliable electrical service, preventing major outages to Puerto Rico's customers.<sup>11</sup> Regarding the Approved IRP, PREPA states that the Proposed Generation Projects are consistent and in accordance with the Approved IRP, which has provisions to maintain a safe and reliable electrical service, while integration of reliable new resources are completed. According to PREPA, the Proposed Generation Projects are repair works to be done in parallel with the transformation of PREPA's existing generation fleet that will continue as renewable generation penetration increases and existing generation retire.<sup>12</sup>

## II. Evaluation of PREPA's November 15 Motion

According to PREPA, the Proposed Generation Projects have the objective to (i) improve the generation asset's reliability, increasing their availability, and providing a continuous generation service, (ii) repair all the damages to equipment and areas within all the Plants; and (iii) restore the facilities to pre-disaster function and approved codes and standards.

The list of works in Attachment A of the November 15 Motion, contained several types of maintenance jobs. Most of these jobs are repairs. Some are preventive in nature, while others are for the acquisition of spare parts necessary for rapid response during future repairs.

There are also works to improve or enhance operations, to install new systems or equipment due to obsolescence, which require engineering design and specifications for new equipment or systems. These classifications should be discussed and agreed upon to ensure that the respective funds are well classified and approved by the corresponding entities.

The estimates for all the works on each Power Plant are presented in Attachments A to I of this Resolution and Order. Some of these Cost Estimates seem high and they should be confirmed by PREPA, according to the corresponding Cost Estimate Class. Attachments A to G of this Resolution and Order are the list of works per Power Plant, Attachment H are the works required in all plants. Attachment I of this Resolution and Order indicates those projects that require further evaluation. The fifth column in each table indicates which projects are conditionally approved and those that require further evaluation by the Energy Bureau.

The Modified Action Plan includes several directives to retire fossil fuel plants consisting of the retirement of the oil-fired steam resources over the next five (5) years, at San Juan,

<sup>7</sup> *Id.*, pp. 1-2.

<sup>8</sup> November 29 Motion, pp. 2-3, ¶ 5.

<sup>9</sup> *Id.*, p. 4, ¶ 8.

<sup>10</sup> *Id.*, p. 5, ¶ 10.

<sup>11</sup> *Id.*, p. 6, ¶ 10.

<sup>12</sup> *Id.*, p. 7, ¶ 12.



including units 7, 8, 9 and 10; at Palo Seco, including units 3 and 4 and at Aguirre including Steam Units 1 and 2; and the plans for retirement of the Aguirre CC Units 1 and 2 ("Retirement Plan").<sup>13</sup>

Taking into consideration the Proposed Generation Projects and the Retirement Plan, the Energy Bureau **DETERMINES** that further evaluation is required for those projects stated in Attachment I. This is to assure that the projects for such units are aligned with the Approved IRP and that the described work is necessary to extend the useful life of the units for an additional two or three years after the work is completed in compliance with the Retirement Plan. The Energy Bureau **TAKES NOTICE** that other utility scale renewable projects would come online on the same period.<sup>14</sup> Attachment I of this Resolution and Order represents a total of **\$90,435,000.00** of the Proposed Generation Projects.

Upon review of the November 15 Motion and the November 29 Motion, the Energy Bureau **DETERMINES** that the majority of the proposed projects are necessary to maintain and improve the reliability of generation fleet and assure the Policy of Reserves ("POR")<sup>15</sup>. Therefore, the Energy Bureau **CONDITIONALLY APPROVES** the Proposed Generation Projects as described in Attachments A to H of this Resolution and Order. The Energy Bureau **DEFERS FOR FURTHER EVALUATION** certain projects, as described in Attachment I of this Resolution and Order.

The Proposed Generation Projects are segregated by Power Plant, with the corresponding estimated totals for each Power Plant as they were presented in the November 15 Motion. The Energy Bureau notes that this conditional approval represents **\$253,774,675.00** based on the Proposed Generation Projects submitted by PREPA through the November 15 Motion.<sup>16</sup>

### III. Conclusion

The Energy Bureau **CONDITIONALLY APPROVES** the projects described in Attachments A to H of this Resolution and Order, pending the submittal by PREPA of the Statement of Work ("SOW") of each project. The Energy Bureau **DEFERS FOR FURTHER EVALUATION** the projects described in Attachment I of this Resolution and Order. The conditionally approved projects shall be presented to FEMA and COR3 to finalize its approval process once the Energy Bureau makes its final determination based on its evaluation of the requested SOWs. The Energy Bureau conditionally approved these projects based on the information provided by PREPA, should the scope of the project change, PREPA **SHALL** immediately seek Energy Bureau's approval of such changes.

The Energy Bureau **ORDERS** PREPA to (i) submit, **within ten (10) days** of the notice of this Resolution and Order, the SOW for each project presented in Attachment A to I of this Resolution and Order for the Energy Bureau's evaluation; (ii) submit to the Energy Bureau copy of the approval by COR3 and/or FEMA of the projects approved in Attachment A to H, which shall contain the costs obligated for each project, **within ten (10) days of receipt of such approval**; (iii) provide the Energy Bureau the actual contracted cost to construct each project approved in Attachment A to H, **within ten (10) days from the execution of the contract**; and (iv) inform the Energy Bureau once the approved projects are completed.

<sup>13</sup> See Approved IRP, p. 284.

<sup>14</sup> See *In Re. Implementation of the Puerto Rico Electric Power Authority Integrated Resource Plan and Modified Action Plan*, Case No. NEPR-MI-2020-0012.

<sup>15</sup> Policy on Reserves defines the minimum operational reserve capacities to maintain a continuous and reliable electrical service. See Motion Submitting Operating Procedures and Request for Confidential Treatment, Exhibit 1, Procedure 14- Policy on Reserves, *In re. Review of T&D Operator's System Operation Principles*, Case No. NEPR-MI-2021-0001, December 23, 2021.

<sup>16</sup> The Energy Bureau has approved a total of \$4,684.541 MM = \$1,240.77 MM + \$1,789.58 MM + \$1,376.97 MM + \$18.257 MM + \$5.189 MM+ \$253.775 MM up to date based on the Class Cost Estimates submitted by PREPA and LUMA as part of this process.





To complete the Energy Bureau's evaluation on the Proposed Generation Projects, PREPA shall file, **within fifteen (15) days** of the notice of this Resolution and Order, the following:


1. The current status of each unit listed in the Proposed Generation Projects,
2. if and how the expenditure will help bring the unit back to availability for operation,
3. when the unit would be available for operation if the expenditure was made,
4. the expected duration of availability status of the unit after the expenditure is made, and any other required explanation.
5. Provide an updated snapshot of the current status of repairs and expected availability over the next three years for the units located at San Juan, Palo Seco, Costa Sur and Aguirre.
6. Provide either the "Draft released to PREPA" of the "10-Year Thermal Generation Retirement, Addition and Conversion Plan" as listed on page 7 of the December 2021 Status Report<sup>17</sup> scheduled for finishing by March 2022 or provide a synopsis of PREPA's current understanding of how planned retirements of the fossil fleet are considered when requesting approval for maintenance and capital investment funding through the instant procedure.

The Energy Bureau **WARNS** PREPA that any projects approved by the Energy Bureau required for maintenance and/or repairs of the generation units shall not be interpreted as a modification to the Approved IRP or the inclusion of fossil fueled generation units not contemplated in the Approved IRP. The Energy Bureau **CLARIFIES** that it has conditionally approved certain works to be completed in the San Juan site that are limited in its use or are out of services, since they provide direct service to San Juan Units 5 & 6.

The Energy Bureau **WARNS** PREPA that any generation projects approved by the Energy Bureau may only be executed by PREPA in accordance with PREPA's generation budget, as approved by the Energy Bureau for Fiscal Year 2022<sup>18</sup>, or supplemented with other source of funding that does not affect the ratepayers.

The directive instated in the March 26 Resolution related to the submission of projects before the Energy Bureau at least thirty (30) calendar days before submitting such projects to FEMA and/or COR3 remains unaltered.

Be it notified and published.

  
Edison Avilés Deliz  
Chairman

  
Ángel R. Rivera de la Cruz  
Associate Commissioner

  
Lillian Mateo Santos  
Associate Commissioner

  
Ferdinand A. Ramos Soegaard  
Associate Commissioner

  
Sylvia B. Ugarte Araujo  
Associate Commissioner



<sup>17</sup> See Motion to Submit December 2021 Status Report in Compliance with Order, page 7 of the report, *In Re: Preliminary Studies for New Combined Cycle Power Plant in Palo Seco*, Case No. NEPR-MI-2021-0003, December 15, 2021.

<sup>18</sup> See Resolution and Order (Determination on LUMA's Initial Budget), Attachment A, *In re. Review of LUMA's Initial Budget*, Case No. NEPR-MI-2021-0004, May 31, 2021.

## CERTIFICATION

I hereby certify that the majority of the members of the Puerto Rico Energy Bureau has so agreed on January 4, 2022. I also certify that on January 4, 2022 a copy of this Resolution and Order was notified by electronic mail to the following: laura.rozas@us.dlapiper.com; margarita.mercado@us.dlapiper.com, kbolanos@diazvaz.law; mvazquez@diazvaz.law. I also certify that today, January 4, 2021, I have proceeded with the filing of the Resolution and Order issued by the Puerto Rico Energy Bureau.

For the record, I sign this in San Juan, Puerto Rico, today January 4, 2022.

  
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Sonia Seda Gaztambide  
Clerk



**Attachment A**  
**Works Approved by the Energy Bureau for San Juan Power Plant Permanent Repairs**

| No. | Work Name  | Work Description   | Estimated cost | Energy Bureau Determination |
|-----|--|--|----------------|-----------------------------|
| 1   | Units 5 and 6 Cooling Tower Replacement  | Removal of existing cooling towers; design, build, installation, start up and commissioning of two new three cells cooling towers, model S3E-1222-07Q-3/SY, manufactured by Baltimore Aircoil Company (BAC), with its Lakos Tower Clean Filtration System. | \$850,000.00   | Conditionally Approved      |
| 2   | Units 5 and 6 New High-Pressure Pumps  | Procurement and delivery of two high pressure water centrifugal pumps with a capacity of 276.6 cubic meter per hour and technical assistance to PREPA for the installation.  | \$1,600,000.00 | Conditionally Approved      |
| 3   | Units 5 and 6 Condenser Repair and Coating Application   | Rehabilitation and application of anti-corrosive coating for the water boxes and intake piping of the east side of the Unit 5 condenser.   | \$615,000.00   | Conditionally Approved      |
| 4   | Units 5 and 6 High Pressure Bleed Valve, Low Pressure Bleed Valve and Heat Injection Steam Valve | Purchase of equipment and parts for the replacement and installation of Vanessa 30,000 Triple Offset Automated Valves - Steam Injection Block Valves & Bleed Valves  | \$350,000.00   | Conditionally Approved      |



| No. | Work Name  | Work Description  | Estimated cost | Energy Bureau Determination |
|-----|--|---|----------------|-----------------------------|
| 5   | Units 5 and 6<br>Black Start<br>Emergency<br>Generator<br>Upgrade                        | Upgrade the controls system for the black start diesel generator system San Juan CTG 5 &6.  | \$350,000.00   | Conditionally Approved      |
| 6   | Units 5 and 6<br>Replacement<br>of Outlet Valves<br>and Elbow<br>Condenser               | Remove and replacement of the existing outlet valve and 42-inch diameter steel elbows, which are part of the outfall of the seawater use to cooldown the condensers of both Units 5 and 6.          | \$350,000.00   | Conditionally Approved      |
| 7   | Unit 7 Air<br>Preheater<br>Maintenance<br>and<br>Replacement                             | Removal and replacement of the existing air-preheaters cold and hot section's baskets, sector plates, adjusters, static seal, axial plates among other components and repair air heater out casing. | \$600,000.00   | Conditionally Approved      |
| 8   | Repairs to<br>Nautilus Water<br>Treatment<br>System                                      | Structural repair of steel floor, walls, application of interior and exterior anti-corrosive coating.   | \$250,000.00   | Conditionally Approved      |
| 10  | Replacement of<br>Two<br>Uninterruptible<br>Power Supply<br>Systems for<br>Units 7 and 8 | Replacement of Two Uninterruptible Power Supply Systems for Units 7 and 8   | \$450,000.00   | Conditionally Approved      |



| No. | Work Name   | Work Description   | Estimated cost | Energy Bureau Determination |
|-----|---|--|----------------|-----------------------------|
| 11  | Units 7-10 New Raw Water Tank                                 | Removal of existing steel raw water storage tank. Design and Build of a new 173,000 gallons steel raw water storage tanks, including interior and exterior coating application, instrumentation system for reading water levels and improvements to the existing tank's concrete base. | \$1,000,000.00 | Conditionally Approved      |
| 13  | Unit 5 SCR - Ammonium Procurement                             | Procurement and delivery of Ammonium Substance to be used for the Selective Catalytic Reduction system to control emissions of Unit 5 for compliance of Federal Law.   | \$500,000.00   | Conditionally Approved      |
| 14  | Units 5-10 Heavy Equipment Rental Services                    | Service of heavy equipment such as 30 Ton, 50 Ton, 70 Ton, 100 Ton and 350 Ton cranes, including mobilization for the performance of repairs and major maintenance works of the main and auxiliary components of Units 5 through 10.   | \$850,000.00   | Conditionally Approved      |
| 15  | Water Treatment and Technical Assistance Cooling Water System | Service of operation and maintenance of a water treatment system for the cooling towers of power plant's auxiliary equipment's. The treatment will protect the infrastructure of the cooling towers.   | \$250,000.00   | Conditionally Approved      |





| No. | Work Name  | Work Description  | Estimated cost  | Energy Bureau Determination |
|-----|--|---|-----------------|-----------------------------|
| 17  | Steam Rotor Replacement Unit 5 & CT Repairs                        | Replacement of all the main components of the steam rotor of Unit 5 and perform all the repairs of the combustion turbine, including its auxiliary equipment's.   | \$12,000,000.00 | Conditionally Approved      |
| 18  | LTSA SJ5   | Inspection, repairs, and replacements of critical parts of the combustors, hot gas path, fuel systems and applicable deteriorated parts in the unit.  | \$8,000,000.00  | Conditionally Approved      |
| 19  | LTSA SJ6   | Inspection, repairs, and replacements of critical parts of the combustors, hot gas path, fuel systems and applicable deteriorated parts in the unit.  | \$8,000,000.00  | Conditionally Approved      |
| 20  | Control System Upgrade units 5 & 6                                 | Perform and upgrade to the Units 5 & 6 Control System, including all the necessary cyber security programming   | \$3,203,000.00  | Conditionally Approved      |
| 23  | Unit 6 - Major Overhaul (Steam Turbine Replacement and CT Repairs) | Inspection, repairs, and replacements of essential parts of the combustion turbine deteriorated over time.  | \$15,000,000.00 | Conditionally Approved      |
| 24  | Installation of Modules D&E HRSG Unit 5                            | Replace critical pressure parts components of San Juan Generation Complex Unit 5 Heat Recovery Steam Generator (HRSG), specifically: Module D High Pressure Economizer 3 Tubes Bundles, Module D Intermediate | \$5,500,000.00  | Conditionally Approved      |



| No.          | Work Name  | Work Description   | Estimated cost         | Energy Bureau Determination |
|--------------|--|--|------------------------|-----------------------------|
|              |  | Pressure Evaporators Tubes Bundles, Module E Intermediate Pressure Economizer Tubes Bundles, Module E High Pressure Economizer 1 Tubes Bundles, Module E High Pressure Economizer 2 Tubes Bundles. |                        |                             |
| 25           | Replacement of the Online Condenser Cleaner Unit 5 | Supply, installation, and commissioning of an online condenser cleaner system for Unit 5.  | \$3,000,000.00         | Conditionally Approved      |
| 26           | Unit 6 - Major Overhaul                            | Inspection, repairs, and replacements of essential parts of the steam turbine deteriorated over time.  | \$10,000,000.00        | Conditionally Approved      |
| <b>TOTAL</b> |  |  | <b>\$72,718,000.00</b> |                             |



**Attachment B**  
**Works Approved by the Energy Bureau for the Aguirre Power Plant & Combined Cycle Permanent Repairs**

| No. | Work Name  | Work Description  | Estimated cost | Energy Bureau Determination |
|-----|--|---|----------------|-----------------------------|
| 31  | Replacement of Load Center 1- 4 Condenser Circulating Water Pump | Removal and removal of existing breakers for the Load Center 1-4 of the Condenser Circulating Water Pumps for the cooling system of the condensers of Units 1 and 2.            | \$600,000.00   | Conditionally Approved      |
| 32  | Sea Water Intake Structural Repairs Work                         | Structural repairs of concrete beams, slabs, and walls components of the sea water intake of the  | \$5,000,000.00 | Conditionally Approved      |
| 33  | Rehabilitation Fuel Tank Farm Liners                             | Rehabilitation, repair, and installation a of approximately 46,000 square feet of Flexible Membrane Liner System of the Aguirre Fuel Farm area.                                 | \$1,200,000.00 | Conditionally Approved      |
| 34  | Two New Condenser Discharge Water Pumps Motors                   | Procurement and delivery of two 400 Hp-395 RPM, 4,000 Volts-3 Phase, 60 Cycle Re-build Motors for the water discharge condenser pumps for the sea water canal discharge system. | \$750,000.00   | Conditionally Approved      |
| 35  | Two New BCWP Motors  | Procurement and delivery of two Hp- RPM New Motors for the water discharge condenser pumps for the sea water canal discharge system.  | \$750,000.00   | Conditionally Approved      |



| No. | Work Name  | Work Description  | Estimated cost | Energy Bureau Determination |
|-----|--|---|----------------|-----------------------------|
| 36  | Procurement of Stages 1, 2, 3 Turbine Rotor Bucket Set, Aguirre Combined Cycle | Buy rotor buckets for spare turbine rotor at Allied Power Group facilities in Houston, TX. Complete rotor is necessary in case replacement is needed during 2022 HGP inspections (Units 1-1 or 1-2)   | \$750,000.00   | Conditionally Approved      |
| 37  | New Water Condensate Tank for the Aguirre Combined Cycle                       | Removal of existing steel water condensate storage tank. Design and Build of a new 287,000 gallons steel water condensate storage tank, including interior and exterior coating application, instrumentation system for reading water levels and improvements to the existing tank's concrete base.                   | \$1,000,000.00 | Conditionally Approved      |
| 38  | Major inspection Unit 1-3  | Remove Turbine Rotor for repair and balance, including rotor buckets. Replace turbine casing shrouds. Replace turbine nozzles, transition pieces and combustion liners with refurbished components. Inspect Compressor (rotor and stator). Inspect Generator (rotor and stator). Repair HRSG casing and exhaust duct. | \$2,500,000.00 | Conditionally Approved      |
| 39  | Hot Gas Path Inspection Work Units 2-4 and stand by transformer                | Inspect turbine section major components (rotor, buckets, nozzles & shrouds). Replace Stage 1 Buckets (if necessary), Stage 1 Nozzle, transition Pieces and combustion liners with refurbished components. Repair all removed components for futures  | \$1,700,000.00 | Conditionally Approved      |



| No. | Work Name   | Work Description  | Estimated cost  | Energy Bureau Determination |
|-----|---|---|-----------------|-----------------------------|
|     |   | HGPI. Buy new MCC Transformer 4.16kV / 480V   |                 |                             |
| 40  | Hot Gas Path Inspection Work Units 1-1 and 1-2          | Inspect turbine section major components (rotor, buckets, nozzles & shrouds). Replace Stage 1 Buckets (if necessary), Stage 1 Nozzle, transition Pieces and combustion liners with refurbished components. Repair all removed components for futures HGPI.                                    | \$2,000,000.00  | Conditionally Approved      |
| 41  | Inner Barrel Bundle                                     | Engineering and manufacture of an inner barrel bundle of the boiler feed water pump to be used in Units 1 or 2.   | \$1,700,000.00  | Conditionally Approved      |
| 42  | Unit 1 - Major Inspection (Replacement Turbo-Generator) | Major Overhaul to Gas Turbine Num. 1 including the replacement of all the hot gas path components and the turbo-compressor blades. Also, repair the exhaust gas housing and performed the inspection of the turbo-rotor, the generator and repair the Gas Turbine enclosure and filter house. | \$11,665,000.00 | Conditionally Approved      |
| 43  | Unit 2 Excitation System                                | Replacement of an obsolete Excitation System that has no replacement parts. The new system must increase the reliability and extend service life with replacement parts and service availability.   | \$1,516,675.00  | Conditionally Approved      |





| No.          | Work Name                                  | Work Description  | Estimated cost         | Energy Bureau Determination |
|--------------|--|---|------------------------|-----------------------------|
| 44           | Purchase and Installation Breakers 480 V   | Procurement and installation of 12 - 600 A, 480 V Breakers and 4 - 1,600 A, 480 V Breakers for Normal Bus 1A EESS                         | \$400,000.00           | Conditionally Approved      |
| 45           | Design Fire Pump for Aguirre Power Complex | Design for an above ground piping lines to replace the obsolete underground piping system. The existing system has undetectable leakages. | \$800,000.00           | Conditionally Approved      |
| <b>TOTAL</b> |  |   | <b>\$32,331,675.00</b> |                             |



**Attachment C**  
**Works Approved by the Energy Bureau for the Costa Sur Power Plant Permanent Repairs**

| No. | Work Name   | Work Description  | Estimated cost | Energy Bureau Determination |
|-----|---|---|----------------|-----------------------------|
| 46  | Travelling Screens Replacement  | Removal and replacement of five galvanized steel travelling screens, with its auxiliary equipment of the power plant's sea water intake for the cooling of the condensers of Units 5 and 6. The work shall include an infrastructure to protect the fish and other marine, in compliance with Section 316 (b) of the Clean Water Act. | \$5,000,000.00 | Conditionally Approved      |
| 47  | Procurement and Replacement of Regulator Valves for Boiler Feed Water Units 5 & 6 | Replace the main boiler feedwater control valves for units 5&6. Actual valves are in bad conditions and the replacements are as expensive as the whole valve.   | \$500,000.00   | Conditionally Approved      |
| 48  | Low Pressure Water Heater 3 Repair Work   | Design, manufacture, provide, deliver, and install new tubes for the Low-pressure heater 3 for Unit 6   | \$400,000.00   | Conditionally Approved      |
| 49  | Procurement of Water Heater 5 (Deaerator) Spare Pump                              | Procurement and delivery of a new spare pump for the water heater (deaerator) of unit 5.  | \$400,000.00   | Conditionally Approved      |



| No. | Work Name  | Work Description  | Estimated cost | Energy Bureau Determination |
|-----|--|---|----------------|-----------------------------|
| 50  | Procurement of Air-Preheaters Baskets, Unit 5  | Procurement and delivery of hot and cold sections baskets and other components of the pre- heaters of Unit 5.   | \$1,000,000.00 | Conditionally Approved      |
| 51  | Replacement of Air-Preheaters Baskets, Unit 5  | Removal and replacement of the existing air-preheaters cold and hot section's baskets, sector plates, adjusters, static seal, axial plates among other components and repair air heater out casing. | \$700,000.00   | Conditionally Approved      |
| 52  | Procurement of Condenser Circulating Water Pump (CCWP) and Boiler Circulating Water Pump (BCWP) Spare Motors for Units 5 and 6 | Procurement and delivery of motors to be storage as spare parts to avoid units forced outages and/or load limitations.  | \$620,000.00   | Conditionally Approved      |
| 53  | Procurement of Induced Draft Fan (IDF) and Forced Draft Fan (FDF) Spare Motors for Units 5 and 6                               | Procurement and delivery of motors to be storage as spare parts to avoid units forced outages and/or load limitations.  | \$870,000.00   | Conditionally Approved      |
| 54  | Procurement of Condensate Pump (CP) Motor for Units 5 and 6  | Procurement and delivery of motors to be storage as spare parts to avoid units forced outages and/or load limitations.  | \$870,000.00   | Conditionally Approved      |



| No. | Work Name  | Work Description  | Estimated cost | Energy Bureau Determination |
|-----|--|---|----------------|-----------------------------|
| 55  | Replacement of Unit 5 Electric Load Center   | Replacement of Auxiliary equipment load centers and breakers for turbines 5 and 6 due to obsolescence.  | \$1,000,000.00 | Conditionally Approved      |
| 56  | Replacement of Excitation System Units 5 and 6   | Procurement and installation of an upgrade for the excitation system. The manufacturer ceases the production of spare parts.  | \$1,500,000.00 | Conditionally Approved      |
| 57  | Replacement of 4160 V Electric Cable Normal Transformer 5A, 5B                                   | Procurement and delivery of 6000 ft of special construction electrical cable (1500 Kcmil Insulation XLPE 5kv) to replace the cables of the Normal service transformers 5A & 5B. | \$250,000.00   | Conditionally Approved      |
| 58  | CS 5 Major Inspection Unit 5 - HP/IP/LP Turbine Rotor Replacement                                | Procurement for the inspection and refurbishment of the spare turbine rotors (HP/IP, LPA & LPB) for the October 2022 programmed outage  | \$6,000,000.00 | Conditionally Approved      |
| 59  | CS 5 Major Outage Unit 5 - Boiler Sections Replacement and Repairs & Auxiliary Equipment Repairs | Procurement and delivery of materials and equipment for the October 2022 programmed outage  | \$9,000,000.00 | Conditionally Approved      |
| 60  | Water Heater 6 Replacement Work  | Procurement and installation of the High-pressure Heater 6 for unit 5.  | \$2,000,000.00 | Conditionally Approved      |



| No. | Work Name                                     | Work Description  | Estimated cost | Energy Bureau Determination |
|-----|---|---|----------------|-----------------------------|
| 61  | Caustic Soda and Acid Tanks Replacement Works | Procurement and delivery of 4 stainless steel tanks (2 storage & 2 service) for the Demi water plant. One pair for soda ash and one pair for sulfuric acid. Installation by plant crew.   | \$750,000.00   | Conditionally Approved      |
| 62  | Unit 6 - HP/IP/LP Inspection (Failure)        | Perform the inspection and non-destructive testing on the Lower Pressure Turbine Rotor Segment B (LP-B) due to an event that caused a major failure on this component.                    | \$945,000.00   | Conditionally Approved      |
| 63  | BFWP Inner Barrel Bundle                      | Engineering and manufacture of an inner barrel bundle of the boiler feed water pump to be used in Unit 5 or 6.  | \$1,700,000.00 | Conditionally Approved      |
| 64  | Unit 6 LP-B Repair Work (Failure)             | Perform repairs of the L-2 covers and buckets and replace covers and buckets fractured during the event. Also, repair or replaced diaphragm's partitions, the spill strips and appendage. | \$1,917,000.00 | Conditionally Approved      |
| 65  | Unit 6 LP-B Installation Work (Failure)       | Installation and commissioning of the repaired Low-Pressure Rotor-B of the Power Turbine of Unit 6  | \$2,000,000.00 | Conditionally Approved      |
| 66  | AGC - Replacement Project                     | Procurement and Delivery of New system for frequency/load control to replace the original one due to obsolescence (installed since  | \$400,000.00   | Conditionally Approved      |





| No.          | Work Name                            | Work Description   | Estimated cost         | Energy Bureau Determination |
|--------------|--------------------------------------|--|------------------------|-----------------------------|
|              |                                      | 1973). There are not spare parts)  |                        |                             |
| 67           | Fuel Igniters Replacement Work       | Procurement and Delivery of New Natural Gas Igniters and Control System for Unit 6   | \$2,000,000.00         | Conditionally Approved      |
| 68           | Upgrade to Foxboro Simulation System | Services of software and hardware installation and programming to update the simulation station of the Foxboro control system. | \$500,000.00           | Conditionally Approved      |
| <b>TOTAL</b> |                                      |  | <b>\$40,322,000.00</b> |                             |



**Attachment D**  
**Works Approved by the Energy Bureau for Palo Seco Steam Plant Permanent Repairs**

| No. | Work Name                                    | Work Description   | Estimated cost | Energy Bureau Determination |
|-----|--|--|----------------|-----------------------------|
| 71  | Fuel Tanks Level Measurement System          | Procurement and delivery of an integrated measurement, accounting, control, monitoring and temperature system for the power plant's fuel tanks.  | \$550,000.00   | Conditionally Approved      |
| 72  | Water Retention Tank Num. 3                  | Removal of existing steel water condensate storage tank. Design and Build of a new 150,000 gallons steel water retention tank, including interior and exterior coating application, instrumentation system for reading water levels and improvements to the existing tank's concrete base. | \$800,000.00   | Conditionally Approved      |
| 74  | Contract, on request, for Crane Services PS4 | Service of heavy equipment such as 30 Ton, 50 Ton, 70 Ton, 100 Ton and 350 Ton cranes, including mobilization for the performance of repairs and major maintenance works of the main and auxiliary components of Units 3 and 4.  | \$700,000.00   | Conditionally Approved      |



| No. | Work Name  | Work Description  | Estimated cost  | Energy Bureau Determination |
|-----|--|---|-----------------|-----------------------------|
| 76  | New Water Condensate 1-2 Tank  | Removal of existing steel water condensate storage tank. Design and Build of a new 173,000 gallons steel water condensate storage tank, including interior and exterior coating application, instrumentation system for reading water levels and improvements to the existing tank's concrete base. | \$1,000,000.00  | Conditionally Approved      |
| 77  | Mega-Gens Environmental Commissioning  | Perform all environmental and performance tests on three 27 Megawatts Combustion Units to comply with EPA's Air Standards   | \$970,000.00    | Conditionally Approved      |
| 78  | Upgrade OSI DCS  | Supply and installation of new Human Machine Interphase for operation and GIS control for both units 3, 4, Mega Gens 1, 2, 3 and Gas Turbines 1-6.  | \$1,500,000.00  | Conditionally Approved      |
| 79  | Upgrade to Mark Vie  | Supply and installation of new Human Machine Interphase for operation and turbine control for both units 3 and 4.   | \$500,000.00    | Conditionally Approved      |
| 81  | Unit PS3 – Major Outage – Boiler Sections Replacement and Repairs; MPT, Generator and turbine Repair & Auxiliary Equipment Inspection Work | Purchase and installation of Economizer elements and waterwalls upper sections replacement. HP, IP and LP turbines inspection, maintenance, and repair. MPT oil leakages repair and Auxiliary equipment   | \$15,000,000.00 | Conditionally Approved      |

**TOTAL**

**\$21,020,000.00**



**Attachment E**  
**Works Approved by the Energy Bureau for Hydro-gas Turbine Peakers Permanent Repairs**

| No. | Work Name   | Work Description   | Estimated cost | Energy Bureau Determination |
|-----|---|--|----------------|-----------------------------|
| 82  | Procurement of Spare Generator Breakers for Frame 5000 Hitachi Gas Turbines | Procurement and delivery of seven (7) 2000amp, 15.0kV rms (operational voltage - 13.18kv) spare main breakers to be used for the Frame 5000 Hitachi Gas Turbines during emergency or maintenance repair works. | \$500,000.00   | Conditionally Approved      |
| 83  | Procurement of Turbo-Compressors for Frame 5000 Gas Turbines                | Procurement and delivery of two (2) Rating 23250KW, 17 stages, 2 stages, 5100 rpm re-build turbo-compressor for the Frame 5000-N Gas Turbines to be used during emergency or repair works.                     | \$4,000,000.00 | Conditionally Approved      |
| 84  | Procurement of Spare Speed Reduction Gear for Frame 5000 Gas Turbines       | Procurement and delivery of two (2) 5094/3600 RPM, Rating; 28,000KW spare speed reduction gears for Frame 5000 Gas Turbines to be used during emergency of repair works.                                       | \$1,200,000.00 | Conditionally Approved      |
| 85  | New Spare Three Exhaust Plenums for Frame 5000 Gas Turbines                 | Fabrication and Delivery of three (3) 117.5" x 75.26" x 106.5" spare steel exhaust plenums for the Frame 5000 Gas Turbines to be used during repair works.   | \$600,000.00   | Conditionally Approved      |



| No.          | Work Name  | Work Description   | Estimated cost         | Energy Bureau Determination |
|--------------|--|--|------------------------|-----------------------------|
| 86           | Procurement of Three Exhaust Gas Diffusion Ducts for Frame 5000 Gas Turbines | Fabrication and Delivery of three (3) 41" Internal Diameter/ 46" External Diameter spare steel exhaust gas diffusion ducts the Frame 5000 Gas Turbines to be used during repair works. | \$300,000.00           | Conditionally Approved      |
| 87           | Major Outage Turbo – compressor (CT) 15 units                                | Major outage for all Frame 5 units which shall include repairs and overhaul of a defined scope as per-unit needs, in order to assure availability and reliability at most.             | \$30,000,000.00        | Conditionally Approved      |
| <b>TOTAL</b> |  |  | <b>\$36,600,000.00</b> |                             |





**Attachment F**  
**Works Approved by the Energy Bureau for Cambalache Power Plant Permanent Repairs**

| No. | Work Name   | Work Description  | Estimated cost  | Energy Bureau Determination |
|-----|---|---|-----------------|-----------------------------|
| 89  | Control System Power Plant Maintenance - Generator and Technical Services | Provide technical support and parts replacement for the generating unit control systems with Original Equipment Manufacturer trained technical advisors. The provided services will be a complete maintenance program for the continuous operations of the included equipment and its systems, especially for the obsolete equipment's. It will include parts replacement, software updates, backups, servers & network devices health issues solution and unexpected issues solutions. | \$2,500,000.00  | Conditionally Approved      |
| 90  | Automatic Voltage Regulator & SFC Upgrade for 2 Units                     | Upgrade of the obsolete electronic parts for the Automatic Voltage Regulator with the Synchronism Devices and the Static Frequency Converter systems for GT2 and GT3. The actual systems are the original ones installed in 1997  | \$1,043,000.00  | Conditionally Approved      |
| 91  | LTSA Units Camb 1-2-3   | Long Term Service Agreement for the A, B & C (Major) inspections on the Cambalache Units. Provide the technical advisors and consumables for all the inspections and the replacement of the scheduled Hot   | \$12,000,000.00 | Conditionally Approved      |



| No.          | Work Name | Work Description  | Estimated cost         | Energy Bureau Determination |
|--------------|-----------|---|------------------------|-----------------------------|
|              |           | Gas Path parts (capital parts) The A & B are the minor inspections. |                        |                             |
| <b>TOTAL</b> |           |   | <b>\$15,543,000.00</b> |                             |



**Attachment G**  
**Works Approved by the Energy Bureau for Mayagüez Hydro-gas Power Plant Permanent Repairs**

| No.          | Work Name                               | Work Description   | Estimated cost         | Energy Bureau Determination |
|--------------|---|--|------------------------|-----------------------------|
| 92           | Unit 1A, 1B<br>and 4A<br>Rehabilitation | Repairs of Gas Generator<br>Components of Units 1A and 1B<br>and Repairs of PT (Upgrade 2+)<br>on Power Turbine on Unit 4A | \$18,800,000.00        | Conditionally Approved      |
| <b>TOTAL</b> |   |  | <b>\$18,800,000.00</b> |                             |



**Attachment H**  
**Works Approved by the Energy Bureau for Jobs in All the Power Plants Permanent Repairs**

| No. | Work Name  | Work Description   | Estimated cost | Energy Bureau Determination |
|-----|--|--|----------------|-----------------------------|
| 93  | Stamp R – Mechanical Repair Works for Boilers and Turbo- Generators Contract | Boilers and Pressure vessels repairs as per the National Board Inspection Code (NBIC).   | \$1,950,000.00 | Conditionally Approved      |
| 94  | Hydro-blasting Service for Condenser   | Pressure washing and neutralization service of the internal and external components of the condensers of the PREPA's power plants.                             | \$650,000.00   | Conditionally Approved      |
| 95  | Hydro-blasting Service for Boilers   | Pressure washing and neutralization service of the internal and external components of the boiler and other areas of the PREPA's power plants.                 | \$950,000.00   | Conditionally Approved      |
| 96  | Interior Dry-Cleaning Service for Boilers                                    | Environmental compliance cleaning of boiler interior   | \$850,000.00   | Conditionally Approved      |
| 97  | Electrical and Instrumentation works in power plants                         | Services of inspection, maintenance and repair of electrical auxiliary components and control systems necessary for the operation of the PREPA's power plants. | \$850,000.00   | Conditionally Approved      |



| No. | Work Name   | Work Description  | Estimated cost | Energy Bureau Determination |
|-----|---|---|----------------|-----------------------------|
| 98  | Procurement Acid for all power plants                         | Procurement and delivered of Acid substance used on the power plant for pH Control during water treatment of process water and demi-water treatment plant maintenance work. | \$1,000,000.00 | Conditionally Approved      |
| 99  | Refractory, Insulation, stack, and Painting Application Works | Services of removal and replacement of refractory material for boilers and stacks, and the removal and application of painting of stacks.                                   | \$1,950,000.00 | Conditionally Approved      |
| 100 | Scaffolding Inside and outside Boilers Works                  | Services of the rental, engineering, and fabrication of scaffolding systems to be used during maintenance and repair works of the PREPA's power plants.                     | \$1,990,000.00 | Conditionally Approved      |
| 101 | Waste Management Services Contract for Power Plants           | Services of collection and deposit of non-hazardous waste materials and non-organic silt material collected from the sludge pools of the PREPA's power plants.              | \$1,000,000.00 | Conditionally Approved      |





| No.          | Work Name   | Work Description  | Estimated cost         | Energy Bureau Determination |
|--------------|---|---|------------------------|-----------------------------|
| 102          | Non-Destructive Examinations and Inspection Services                | Services of inspection and testing of repair processes such as welding of boiler tubes, construction or repair of water and fuel tanks.   | \$750,000.00           | Conditionally Approved      |
| 103          | Inspection and Maintenance Cargo Elevator                           | Inspection of and maintenance service of the cargo elevators used to transport personnel, materials, and equipment necessary for the operation and maintenance of the PREPA's power plants.                             | \$900,000.00           | Conditionally Approved      |
| 104          | Coating Application Boiler Structures and Chimneys All Power Plants | Supply all materials, equipment and services for the surface preparation and application of paint coating of all structural elements that supports all the power plant's boiler components and also the exhaust stacks. | \$3,600,000.00         | Conditionally Approved      |
| <b>TOTAL</b> |   |   | <b>\$16,440,000.00</b> |                             |



**Attachment I**  
**Projects Which Require Further Evaluation**

| No. | Facility             | Work Name                               | Work Description   | Estimated cost  | Energy Bureau Determination    |
|-----|----------------------|---|--|-----------------|--------------------------------|
| 9   | San Juan Power Plant | Cooling Tower Unit 10 Repair Works      | These technical specifications cover the work required under this Contract for the design, manufacture, delivery, and erection for one (1) new cell of 3,000 GPM, and the dismantling of the one (1) existing cell of the cooling towers of the units 10 PREPA's San Juan Plant. | \$385,000.00    | Further Evaluation is Required |
| 12  | San Juan Power Plant | Structural Repairs Fuel Service Tank 10 | Structural steel repairs of floor, roof, shell, columns and beams elements of an existing fuel service tank and application of new anti-corrosive coating on the interior and exterior of the tank.  | \$750,000.00    | Further Evaluation is Required |
| 16  | San Juan Power Plant | Unit 10 Rehabilitation                  | Provide parts and service for the open-inspection and close of the steam turbine and generator. Also, in shop repairs for the steam turbine and the generator rotor and oil flush of the turbine.  | \$16,000,000.00 | Further Evaluation is Required |



| No. | Facility             | Work Name   | Work Description  | Estimated cost  | Energy Bureau Determination    |
|-----|----------------------|---|---|-----------------|--------------------------------|
| 21  | San Juan Power Plant | Unit 8 Rehabilitation (Turbine)   | Inspection and replacement of the High Pressure, Intermediate Pressure and Low-Pressure Rotors of the Turbine and perform all the testing and commissioning of the equipment. | \$10,000,000.00 | Further Evaluation is Required |
| 22  | San Juan Power Plant | Unit 7 Rehabilitation (Turbine)   | Inspection and replacement of the High Pressure, Intermediate Pressure and Low-Pressure Rotors of the Turbine and perform all the testing and commissioning of the equipment. | \$10,000,000.00 | Further Evaluation is Required |
| 27  | San Juan Power Plant | Unit 7 - Major Outage - Boiler Sections Replacement and Repairs & Auxiliary Equipment Inspection Work | Necessary Repairs of deteriorated Boiler Tubes and Assemblies, and Auxiliary Equipment.   | \$8,000,000.00  | Further Evaluation is Required |
| 28  | San Juan Power Plant | Unit 8 - Major Outage - Boiler Sections Replacement and Repairs & Auxiliary Equipment Repairs         | Necessary Repairs of deteriorated Boiler Tubes and Assemblies, and Auxiliary Equipment.   | \$8,000,000.00  | Further Evaluation is Required |
| 29  | Aguirre Power Plant  | Unit 1 South Wall Boiler Tubing Replacement and Boilers Repairs                                       | Partial rehabilitation of the south water wall between third and fourth floor on Unit 1 consisting on Boiler Tube Panels replacement.   | \$7,000,000.00  | Further Evaluation is Required |



| No. | Facility              | Work Name  | Work Description   | Estimated cost | Energy Bureau Determination    |
|-----|-----------------------|--|--|----------------|--------------------------------|
| 30  | Aguirre Power Plant   | Unit 1 Air and Gas Duct Pre- Heaters Repair Works                                | Inspections looking for leakages and repairs on ducts will be addressed including insulation repair.   | \$1,000,000.00 | Further Evaluation is Required |
| 69  | Palo Seco Steam Plant | PS 3 Procurement and Delivery of Water Wall Boiler Tubes and Economizer Unit PS3 | Manufacture, testing and delivery of the following components of the Unit 3 boiler; the economizer and water wall boiler tubes.                | \$5,000,000.00 | Further Evaluation is Required |
| 70  | Palo Seco Steam Plant | PS 3 Low Pressure Turbine Rotor Refurbished, Unit 3                              | Inspection, transportation, maintenance, and repair of the power turbine spare low-pressure rotor.   | \$2,000,000.00 | Further Evaluation is Required |
| 73  | Palo Seco Steam Plant | Unit PS 4 Refractory, Insulation, scaffolding and Painting Application Works     | Service of scaffolding installation, removal and installation of boiler's refractory and painting of stacks and other components of the Unit 4 | \$1,000,000.00 | Further Evaluation is Required |
| 75  | Palo Seco Steam Plant | Procurement Turning Gear System, Units 3 and 4                                   | Purchase of new turning gear system for Units 3 or 4 replacement.  | \$300,000.00   | Further Evaluation is Required |
| 80  | Palo Seco Steam Plant | Unit 4, Superheater Header Num. 5 Material and Installation                      | Purchase and installation of Superheater 5 component of the Unit's 4 boiler.   | \$3,000,000.00 | Further Evaluation is Required |



| No. | Facility   | Work Name             | Work Description  | Estimated cost         | Energy Bureau Determination    |
|-----|------------|-----------------------|---|------------------------|--------------------------------|
| 88  | Cambalache | Unit 1 Rehabilitation | Perform the required inspections, repair the exhaust gas housing and GT enclosure and filter house and replacement of all of the hot gas path components, turbo-compressor and blades and its related accessories of Gas Turbine Num. 1. Also, conversion of control system to Blue- Line similar to gas turbines 2 and 3, upgrade the combustor pulsation monitoring system, upgrade the automatic voltage regulator, and upgrade the opacity monitoring system. | \$18,000,000.00        | Further Evaluation is Required |
|     |            |                       | TOTAL   | <u>\$90,435,000.00</u> |                                |

