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:** Motion Submitting Nine Scope of Works in Connection with Genera's FY2025 NME Budget Reallocation Request

MOTION SUBMITTING NINE SCOPE OF WORKS IN CONNECTION WITH GENERA'S FY2025 NME BUDGET REALLOCATION REQUEST

TO THE HONORABLE PUERTO RICO ENERGY BUREAU:

COMES NOW GENERA PR LLC ("Genera"), as agent of the Puerto Rico Electric Power Authority ("PREPA"),[1] through its counsel of record, and respectfully states and requests

1. On June 26, 2024, following various procedural developments, the Energy Bureau of the Puerto Rico Public Service Regulatory Board ("Energy Bureau") issued a Resolution and Order titled *Determination on the FY25 Annual Budgets for the Electric Utility*[2], through which the Energy Bureau amended the proposed FY2025 Budget Submission as outlined in the June 26th Resolution. Additionally, the Energy Bureau concluded that the FY2025 Budget Submission, as

[1] Pursuant to the *Puerto Rico Thermal Generation Facilities Operation and Maintenance Agreement* ("LGA OMA"), dated January 24, 2023, executed by and among PREPA, Genera, and the Puerto Rico Public-Private Partnerships Authority, Genera is the sole operator and administrator of the Legacy Generation Assets (as defined in the LGA OMA) and the sole entity authorized to represent PREPA before the Energy Bureau with respect to any matter related to the performance of any of the O&M Services provided by Genera under the LGA OMA.

[2] *See*, Resolution and Order issued by the Energy Bureau, *In Re: LUMA Initial Budgets and Related Terms of Service*, Case No.: NEPR-MI-2021-0004, June 26, 2024 ("June 26th Resolution")

adjusted and amended per the June 26th Resolution, was in compliance with Act No. 57-2014[3] and the 2017 Rate Order[4].

2. On August 23, 2024, Genera filed a document titled *Motion to Request Reapportionment of GenCo's FY2025 Necessary Maintenance Expense Budget*[5], through which Genera requested authorization to reapportion its approved Necessary Maintenance Expense ("NME") Budget for Fiscal Year 2025 ("FY25"). Considering its operational requirements and with reliability of service as the cornerstone, alongside the determinations made by the Energy Bureau in the June 26th Resolution, Genera sought to reapportion the NME Budget to better align with the company's current and projected needs to ensure reliability. This realignment was essential to provide Genera the financial flexibility needed to adapt to changing operational demands. To achieve this, Genera proposed establishing new budget lines for the precise allocation of resources to critical areas. Additionally, the proposed reapportionment aimed to further reallocate resources to alternative federal funding sources.

3. On August 28, 2024, Genera filed a document titled *Motion to Supplement the Reapportionment Request of GenCo FY2025 Necessary Maintenance Expense Budget*[6], through which Genera expanded on the need for the requested reapportionment of funds, mainly those to operate the fourteen (14) TM2500 aeroderivative gas generators. Additionally, in the August 28th

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[3] *See* Act No. 57, of May 27, 2014, as amended, also known as the "*Puerto Rico Energy Transformation and RELIEF Act*" ("Act No. 57-2014").

[4] *See* Final Resolution and Order, *In Re: Puerto Rico Electric Power Authority Rate Review*, Case No. CEPR-AP-2015-0001, January 10, 2017 ("2017 Rate Order").

[5] *See*, *Motion to Request Reapportionment of GenCo's FY2025 Necessary Maintenance Expense Budget*, filed by Genera on August 23, 2024 ("August 23rd Motion"), in case *In Re: LUMA Initial Budgets and Related Terms of Service*, Case No.: NEPR-MI-2021-0004.

[6] *See,* Motion *to Supplement the Reapportionment Request of GenCo FY2025 Necessary Maintenance Expense Budget*, filed by Genera on August 28, 2024 (" August 28th Motion")

Motion, Genera articulated that to achieve reliability of service, it was crucial to reevaluate the approved NME budget allocation to better align with its current and projected operational demands. In pertinent part to this motion, Genera's proposed reallocation included modifying the source of funding for some existing and budgeted projects to alternative Federal Funding sources. Genera further argued that the proposed reallocation would enhance its resource management capabilities and the utilization of Federal Funding sources.

4. On September 9, 2024, the Energy Bureau issued a Resolution and Order titled *Genera's Reapportionment Petition* ("September 9th Resolution"), which specified the need for additional information to effectively review Genera's submission associated with the August 23rd Motion.

5. On September 23, 2024, Genera submitted a document titled *Motion Submitting Response to Resolution and Order Dated September 9, 2024* ("September 23rd Motion"), which provided detailed justifications for the proposed adjustments to the NME Budget allocations, directly addressing each concern raised by the Energy Bureau in its September 9th Resolution. Exhibit A to the September 23rd Motion detailed the reallocation of funds based on revised assessments, procurement updates, and equipment availability, while highlighting ongoing efforts to secure funding from the Federal Emergency Management Agency to cover expenses of significant repairs, including turbine rotor refurbishments and environmental projects. Genera noted that these projects are scheduled for completion within FY2025, with some extending into subsequent fiscal years, ensuring the operational reliability, efficiency, and regulatory compliance of Puerto Rico's power generation infrastructure under Genera's management.

6. On October 28, 2024, the Energy Bureau issued a Resolution and Order titled *FY 2025 NME Genera Budget Reallocation Petition* ("October 28th Resolution"). Through the October

28th Resolution, the Energy Bureau highlighted several issues with Genera's management of maintenance projects and funding strategies. Pertinent to this Motion, the Energy Bureau ordered Genera to submit to the Energy Bureau for review and approval as part of the referenced case[7], within thirty (30) days of the notification of the October 28th Resolution, the required Scopes of Work ("SOW") for each of the NME projects to which Genera attributes Federal Funding.

7. On November 4, 2024, Genera filed a document titled Motion Submitting Seven (7) Scopes of Work in Connection with Genera's FY2025 NME Budget Reallocation Request ("November 4th Motion"). Through this motion, Genera aimed to facilitate the review process by the Energy Bureau by including, as Exhibit A, seven (7) SOWs covering fifteen (15) NME projects for which it seeks Federal Funding. Genera also indicated that the remaining projects would be submitted within the timeframe stipulated in the October 28th Resolution.

8. In compliance with the October 28th Resolution and in accordance with the November 4th Motion, Genera respectfully submits, as Exhibit A to this Motion, the remaining required SOWs for the NME projects that have not yet been submitted for consideration by the Energy Bureau and to which Genera attributes Federal Funding. This submission includes twenty-three (23) NME projects, and their corresponding SOWs are detailed in the reference table attached as Exhibit B to this Motion.

WHEREFORE, Genera respectfully requests that the Energy Bureau **take notice** of the above for all purposes and **deem** Genera to be in compliance with the October 28th Resolution, as it pertains to the submittal of NME projects SOWs.

RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, this 27th day of November 2024.

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[7] *In Re: Review of the Puerto Rico Electric Power Authority's 10 Year Infrastructure Plan - December 2020*, Case No. NEPR-MI-2021-0002

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and accurate copy of this motion was filed with the Office of the Clerk of the Energy Bureau using its Electronic Filing System and that I will send an electronic copy of this motion to the PREPA's counsel, Mirelis Valle Cancel, at mvalle@gmlex.net, and Alexis Rivera, at arivera@gmlex.net; and to LUMA's counsel, Margarita Mercado, at margarita.mercado@us.dlapiper.com, and Yahaira De La Rosa, at yahaira.delarosa@us.dlapiper.com.

In San Juan, Puerto Rico, this 27th day of November 2024.

/s/ Alejandro López-Rodríguez
Alejandro López-Rodríguez

Exhibit A

I. Overview

Project Name: 1. UNIT 6 HEAT RECOVERY STEAM GENERATOR (HRSG)HOTSPOTS MITIGATION

2. Safety Valves Rehabilitation and Certification U5-6

Project Type: 428 Detailed SOW

Project Location : Mercado Central Avenue, Zona Portuaria Road PR-28, Puerto Nuevo PR 00920

Latitude/Longitude : 18.427720, -66.105067

Version : 0

II. Introduction

PREPA is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns the power plants for electric generation, transmission, and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 3.4 million people. Genera-PR is the operator authorized under a Public-Private Partnership agreement of the thermal generation facilities of Puerto Rico. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair and improvement. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements.

On September 6, 2017, Puerto Rico's northern coastline was struck by Hurricane Irma, a Category 4 storm. Two weeks later, on September 17, Hurricane Maria tore through the island of Puerto Rico as a Category 5 storm. Subjected to 150+ mph winds and more than 25 inches of rain, 3.4 million residents lost power and a great deal of infrastructure, including critical facilities, was damaged. In particular, the electrical infrastructure suffered catastrophic impacts. In the aftermath, diligent recovery and reconstruction have been going on, not only to restore the electrical infrastructure to pre-storm function and capacity, but to take this opportunity to bring it in line with current standards and technology. With the recovery funding available, "*Everyone can be sure that we are working responsibly to achieve efficiencies, reduce costs, decommission inefficient and polluting plants, and continue to transform our electrical system for the*

benefit of our economy and our people" as Governor Pedro Pierluisi said, this being an opportunity to not just to rebuild the system but to transform it into a smarter, more resilient, and cleaner one. Puerto Rico's generation system must meet customer demand and have adequate additional capacity to comply with the reserve required by the standard operating procedures of the T&D system operator (LUMA). In terms of service continuity, the system must be reliable so that service interruptions are within the margins established in the electrical industry standards.

In 2020 the situation became more complicated when earthquakes events 4473DR-PR provoked more damages to Costa Sur Power Plant. Later, in September 2022, Hurricane Fiona 4671DR-PR also impacted Puerto Rico, destroying even more the already fragile generation assets. Unfortunately, the generation system presents critical performance metrics with a deficiency in capacity to meet the energy demand and the minimum reserve requirements. The forced outage percentage of the units is increasing while the generation capacity decreases. This combination of factors puts the continuity of the service at high risk, adversely affecting the quality of life of those who live in PR.

Genera is responsible for operating and maintaining PREPA's legacy asset generation fleet pursuant to the Generation O&M Agreement. The current fleet condition presents poor performance due to the impact of hurricanes María and Fiona. Generation capacity has been reduced to 46% of installed capacity. In addition, of the generation units in operation, about 32% or 640 MW, are disconnected monthly, causing thousands of customers to suffer interruptions in their service.

The Puerto Rico Electric Power Authority ("PREPA") is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns and operates electric generation, transmission and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 1.5 million customers. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair and improvements. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements. On January 2023, PREPA and the Puerto Rico Public-Private Partnership Authority ("P3 Authority") selected Genera PR, LLC ("Genera") to operate, maintain and modernize the Generation system of PREPA for ten years through a public-private partnership.

To improve the system's reliability, Genera proposes to submit for approval the Detailed Scope of Work (SOW) to COR3 and FEMA for the 662947 under DR-4339-PR Public Assistance. The document provides a description of the project including scope, schedule, and cost estimates as well as Environmental & Historical Preservation ("EHP") requirements.

III. Project Description

PREPA's Generation System Program was developed and is being executed using the industry standards, following the equipment's manufacturer recommendations and PREPA policies. Periodical inspections, tests are performed to identify critical component repairs/replacement in equipment such as boilers, turbines, generators, power transformers, circuit breakers, protection and control relays, grounding mats, and auxiliary equipment.

Genera PR proposes to perform necessary repair and/or replacement of Steam Generator (HRSG)Hot Spots Mitigation and critical generation components pursuant to the Generation O&M Agreement between PREPA, the P3A, and Genera PR.

A detailed SOW version will be submitted to FEMA per facility.

The San Juan Plant is located on the northern coast of Puerto Rico in San Juan. It consists of four thermal steam units and two combined-cycle units with a total nameplate capacity of 864 MW. The Plant has two main types of power generation units: conventional steam plants (Units 7, 8, 9, and 10) and combined-cycle power blocks (Units 5 and 6). The four conventional steam plants are fired using heavy fuel oil (HFO) and consist of a Combustion Engineering (now GE Power) natural circulation boiler, a General Electric condensing steam turbine (ST) generator and supporting auxiliary equipment. Each generator is rated for 133,689 kVA, and each unit (Units 7, 8, 9, and 10) is rated at 100 MW. Construction of the Plant began in the early 1950s and continued with Unit 7 going into commercial service in 1965 and the last thermal unit, Unit 10, beginning commercial service in 1968.

The project location can be seen in Figure 1.

Figure 1: Project Location

IV. Codes and Standards

The following will be referenced when applying specific codes, specifications, and standards to the project design:

- Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR, February 2020.
- Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.

- FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
- Rus 1730B - The referenced standards, as defined and as per their requirements, state every system is required to have an Emergency Restoration Plan (ERP) in the event of a major failure or storm event.
- National Board Inspection Code (NBIC)
- American Petroleum Institute (API)
- American Society for Nondestructive Testing (ASNT)
- National Fire Protection Association (NFPA)
- U S Environmental Protection Agency (EPA)
- Puerto Rico Environmental Quality Board (EQB)
- National Association of Corrosion Engineers (NACE)
- American Standard Testing Material (ASTM)
- American Welding Society (AWS)
- College Of Engineers and Land Surveyors of Puerto Rico (CIAPR)
- Department Of Transportation of Puerto Rico (DOT)
- American National Standards Institute (ANSI)
- International Organization for Standardization (ISO)

V. 428 Solution

Scope of Work (work to be complete)

The objective of the project is to repair the internal insulation (hot spot) and install new pumpable insulation on different areas of San Juan Generation Complex UNIT 6 Heat Recovery Steam Generator (HRSG).

General Requirements

- The contractor shall provide all labor, materials, tools, equipment, inspection, supervision, engineering, transportation, all necessary services, job administration, and all work required for the mitigations of hot spots of the HRSG 6 as specified in this document.

- The works for the rehabilitation of San Juan Generation Complex UNIT 6 HRSG hot spots includes the mitigations of the following components, as identifies in the Dekomte Thermographic Inspection #01204268:

    i. Transition Duct: Areas T1, T2, T3, T5, E1, E2, E5, E6, E7, E8, W1, W2, W5, W6, W7, W8 and W9,

ii. Module A, B and C Areas: E9, E13, E14, E15, E16, W11, W12, W13, W16 and the bottom front wall.

- Disposal of used materials shall be performed by the Contractor in containers supplied by Genera with previous coordination.

- The Contractor shall supply all necessary equipment to perform the pumpable insulation injection.

- A thermographic test shall be performed by the Contractor and Genera representative as soon as all labor is completed, to assure the complete mitigation of the hot spot.

- Cut and weld preparation is needed to inject the pumpable insulation.

- Cleaning up:

  i. The work area shall be kept in a clean and orderly condition.
  ii. Upon completion of the work the Contractor shall be responsible for the removal from the premises of all garbage, remaining rubbish, unused materials and waste resulting from the scope of work in strict compliance with local and federal environmental laws. In the event of his failure to do so the same may be removed by Genera at the Contractor's expense. Unused material and/or parts shall be returned to the site Warehouse coordinated with the Engineer and the site's Head of Maintenance Manager.

- The Contractor shall submit a schedule for the rehabilitation activities to be performed.

- The Contractor shall furnish all necessary materials, such as welding nozzles, caps, hoses, and others required to perform the scope of work.

- To perform this scope of work the Contractor shall prepare all required bevels as specified or required.

- The Contractor shall also furnish all accessories, services and appurtenances as called for in the specifications or which he deems necessary to make a complete and well-integrated installation within the scope of this specification.

- The work shall be executed by qualified personnel with 5 years' minimum experience in repairs / rehabilitation of hot spots on HRSG's and duly recognized in the industry for this type of work. Evidence of the above-mentioned experience shall be presented.

- The contractor is required to furnish all labor, personnel, materials not provided by Genera, tools, equipment, job administration and supervision; and shall perform all work to the entire satisfaction of Genera's representative.

- The Contractor shall be responsible of move all the pumpable insulation from the San Juan Generation Complex A19 warehouse to UNIT 6 HRSG.

a. **Pumpable Insulation hot spot mitigation:**

(1) Rehabilitate the areas identifies in the Dekomte Thermographic Inspection #01204268, using the pumpable insulation (aka Liquid Mastic) repair technic. The areas are:

- Transition Duct: Areas T1, T2, T3, T5, E1, E2, E5, E6, E7, E8, W1, W2, W5, W6, W7, W8 and W9,
- Module A, B and C Areas: E9, E13, E14, E15, E16, W11, W12, W13, W16 and the bottom front wall.

(2) Supply all necessary equipment to perform the Hot Spots Repairs, including the welds of nozzles and caps to the areas of the HRSG identifies with problems in the Thermographic report and the equipment necessary for pumpable insulation injection.

(3) During the installation process the Contractor removes components of the HRSG to get access to the areas, then the contractor shall restore all to the original design condition. The Contractor shall paint the areas where the nozzles will be installed after welding activities.

(4) Genera will furnish the scaffoldings to access the areas identified in point a.1. Also, Genera will supply the pumpable insulation necessary to perform the scope of work. The pumpable insulation specifications are as follows:

- Kaowool Pumpable (Standard Grade) from Morgan Advance Materials, for applications up to 2000F.

(5) Supply pumps, nozzles, caps, paint, hoses, and any hardware necessary to perform the Scope of Work.

(6) Inspect the inner liner plates condition before using the pumpable insulation. Document any reportable observation.

- All the inspections, testing, and job site visits shall be done in coordination with Genera Project Manager or its field representative.
- All the tests must be performed in the presence of Genera authorized personnel.

INSPECTION AND REPAIR OF WELDED IN-LINE VALVES AND SAFETY DEVICES Unit 5-6

Initial Scope of Work

The Contractor shall provide all labor, supervision, tools, equipment, insurance, and bonds, and perform all work required to inspect and repair welded in-line valves and safety devices (safety valves, welded inlet relief valves, and safety-relief valves) on boiler external piping and non-boiler external piping, all included in this Contract as requested by the Engineer's Individual Mobilization Letter.

A. Repair, modify, test, and re-adjust various types of gate valves, globe valves, plug, regulators valves, safety and relief valves, and others. To perform these activities, the movable trailer must be in excellent condition. The Contractor shall be responsible for the protection of the trailer and all equipment, material, and tooling in it; if necessary, workshops located outside the power plant can be used with GeneraPR approval. The Contractor shall supply all materials, parts, and tools that are required for such repairs except for larger spare parts as follows:

1. <u>For Gate and Globe Valves</u>

    a. Body
    b. Bonnet
    c. Plug
    d. Disc and wedges
    e. Seat rings
    f. Stem

2. For Check Valves

    a. Body
    b. Disc
    c. Seat
    d. Bonnet
    e. Pivot and counterweight

3. For Control Valves

    a. Body
    b. Seat
    c. Sleeve
    d. Bonnet
    e. Plug
    f. Stems

4. For welded Safety Devices

    a. Body
    b. Yoke
    c. Nozzle
    d. Valve Seat
    e. Seat holder
    f. Seal
    g. Disk, Disk holder, and Collar
    h. Adjusting Rings
    i. Bonnet
    j. Spring and spring carrier
    k. Spindle
    l. Lever
    m. Guides
    n. Thrust bearing

Any major spare parts that are not economically reasonable to repair after the inspection performed by the Contractor and GeneraPR shall be supplied by the Contractor, as agreed with GeneraPR.

B. Workshop activities

1. All repairs shall be performed at the job site and in place. However, if it is determined that some of the work required to be realized outside the job site, this activity shall be approved by GeneraPR before being sent out of GeneraPR installations.
2. If some repair activities require subcontracting, GeneraPR's approval must be obtained before selecting the subcontractor.
3. All workshop activities shall be covered in these Contract specifications at no additional cost for to GeneraPR.

C. Welding Personnel qualifications, equipment, and procedures

1. All welders shall be classified in welding procedures applicable and in compliance with the American Society of Mechanical Engineers (ASME) B31.1 [Power Piping Code] (for steam generated over 15 psig and high temperature water generated at pressures over 160 psig and/or temperatures over 250ºF) and ASME Section IX of the Boilers and pressure vessels Code. Welder certifications shall be current. **All qualification documents of the welders, welding operators, welding equipments and welding procedures shall be included as part of the Contract documents** and available for inspection by the representative of GeneraPR during the time that the contract is in force.

2. The all-welding procedures shall be written and qualified in accordance with ASME Code B31.1 or ASME Section IX. The procedures for filling welded using stainless steel, stellite and other hard surfaces alloys, shall be available for inspection by PREPA's representative. **All welding shall follow the preheating of the base material as required in Section V-131, "Welding Preheat";** shall be performed by use of PQR's (procedure qualification records; Section V-127.5), WPS's (welding procedure specifications – welding and welding operators; Section V-127.5), WPQ's (welder performance qualifications; Section V-127.5)**; post-welding heat treatment (PWHT)** (minimum of 2 hours soak holding time @ 1375 ºF per heat treat traveler) **of repair as required by Section V-132 "PWHT Requirements"** as outlined in American Society of Mechanical Engineers Code B31.1.

3. All non-destructive testing personnel shall be qualified as CP-189 (prefered) or SNT-TC-1A, level II inspector. NDE procedure of defect area shall be done either by PT or MT, per Section V - 136.4.3 for MT and 136.4.4 for PT; final NDE of the repair as required in Section V-136.4 "Examination methods for welds and repairs. Level II inspectors shall be qualified for liquid penetrant (LP), and magnetic particle (MP) methods. The Contractor shall provide qualified experts in these methods. The Contractor shall have a representative available for the duration of the Contract.

4. The maximum procedure acceptable criteria for Magnetic Particle Examination (MT) shall be as described on the ASME Code B16.34 Mandatory Appendix II-2 for linear or rounded indications.

5. The maximum procedure and acceptable criteria for for Liquid Penetrant Examination (PT) shall be as described on the ASME Code B16. 34 Mandatory Appendix III-2 for linear or rounded indications.

D. Certifications

1. The Contractor shall submit with the proposal with the following certifications or stamps issued by the the American Society of Mechanical Engineers (ASME), the National Board of Boiler and Pressure Vessel Inspectors (NBBI). Completion of repairs and alterations shall be verified by inspection and testing as defined by applicable ASME Boiler and Pressure Vessel Code (BPVC), ASME Pressure Piping Code, and National Board Inspection Code (NBIC):

    a. "VR" REPAIR OF SAFETY VALVES (NBIC) – for repairs to pressure relief or pressure safety valves with the ASME code "V" – Boiler Safety Valves or the ASME code "UV" – for pressure vessel pressure relief valves.

    b. "R" REPAIR AND ALTERATION (NBIC) – for the repair and/or alteration of boilers, pressure vessels, and other pressure-retaining items that require welding to ASME code stamped vessels (the ASME code stamp "U" – for pressure vessels, the ASME code "UM" – for miniature pressure vessels, the ASME code "H" – for heating boilers, et cetera)

E. Valve repair specifications:

1. The repair work described in this clause includes, but not limited to:

    a. remove, open and dismantle to inspect all components
    b. welding, machining and polish the discs, seats, stems, guides, etc.

    c. remove, repair and reinstall in-line valves, that are welded to pipes if required
    d. repair by welding the valve body due to repair of cracks
    e. stress relieving
    f. final inspection
    g. validation test
    h. mark, identify or label the repaired valve by *TAGS*
    i. removes and install the valve operating mechanism
    j. replaces gaskets and screws or bolts

2. The valves repaired, in accordance with these specifications, **shall have a quality equal to or better than a new valve**. The contractor shall comply with the specified.

3. **Each valve shall be dismantled and reduced to its smallest component**. The Contractor can use hot chemicals for cleaning before and after dismantling. Precautions must be taken to protect the finish of the surfaces that could be damaged during cleaning. After cleaning the parts, the Contractor must perform nondestructive tests such as: the liquid penetrant (LP) or magnetic particles (MP) to determine the true condition of the valve. These valve condition tests shall be conducted by certified specialist Level II, according to CP-189 (prefered) or SNT-TC-1A.

4. Body

    a. The valve body surface (materials ASTM A216-WCB, ASTM A216- WCC, ASTM A217-WC6 and ASTM A217-WC9) shall be examined to determine if corrosion or erosion has occurred. The Contractor shall take steps to show that the valve body wall thickness is appropriate, in accordance with specified in ANSI B 16.5 and ANSI B 16.34 in force.

b. Any crack shall be examined using the method of magnetic particle (MP), magnetic flux or by another method that is approved by the American Society for Testing and Materials (ASTM).

c. Cracks or localized areas of corrosion or erosion can be corrected by filling the location area using welding procedures, qualified and certified welders, according to the requirements of Section IX of the Code of boilers and pressure vessels (BPVC) of the American Society of Mechanical Engineers (ASME). After finishing the filling process, the welded area must have a soft and smooth finish to provide adequate flow characteristics through the valve and get smooth transitions in the thickness of the valve body. The wall thickness shall be checked after welding.

d. All threaded openings must be inspected and repaired as necessary so that full penetration across the thread is obtained.

5. Stem

a. The general condition of the stem should be up to optimum standards for their generation. Specifically, the stem must be straight, the threads must be in good condition, and the surface must be polished for a smooth operation.

b. The maximum allowable reduction in the diameter of the stem at the packing area is 1/32 inch. Over this tolerance, the stem shall be filled with a welding rod, taking care that no deformation or any other condition due to the welding process, the stem unsuitable for use.

6. Spindle Runout (for safety devices)

It is important that the spindle be kept very straight in order to transmit the spring force to the disc without lateral binding. The total indicator reading should not exceed .007" (0.18 mm) when the spindle is rotated. If it does, the spindle must be straightened, until the spindle is within the specifications prior to reuse. Other parts of the spindle not used as working surfaces may run out considerably more than .007" (0.18 mm), but this should not be regarded as unacceptable.

7. Bolts or Studs

All bolts or studs shall be replaced with new ones equal to those required by the valve manufacturer's specification.

8. Stuffing Box

   After removing the old packing gaskets, the Contractor must examine the condition of the stuffing box. The surface should be smooth and should be overhauled acceptably as required.

9. Packing

   a. The replacement packaging should be of equal or greater quality to the CHESTERTON model 1600.

   b. The packing on valves having a "live loading" system shall be repaired with a repair kit, or all be replaced, as required (coordinated with the Maintenance Head at the job site).

   c. c. The packing shall be installed with ends that overlap by one complete turn and tight together. Each joint shall be installed in an opposed rotation.

   d. **Packing larger than the required is prohibited to compensate for wear on the shaft**.

   e. **The use of asbestos packing is not allowed**.

10. Seal Seat Rings

    a. The seal ring should be filled by welding, using the right material, machine finished, and stoned to adjust to restore the seat profile to OEM Specifications. The final restoration must allow movement due to wear as specified by the manufacturer of the valve. The welding procedure shall be as described in Article 2.C of this document and follow the minimum heat treatment as noted below:

       i. Preheat Welding heat treatment to 400 °F minimum.

ii. For stellite trim seats: apply a minimum of two layers of Stellite 21 and cool down to below 175 °F and visually inspect the welds.

iii. For post-welding heat treatment (PWHT), hold for a minimum of 2 hours at 1375 °F per heat treat traveler.

b. **The use of shims, sleeves, or filler caps behind the seat rings is prohibited**.

c. c. The Contractor shall supply new seal rings if the inspection reveals that the installed rings are beyond repair and that new ones are needed.

In addition, the seat area of the rings should be machined according to the dimensions of the new ring, which must be of a design, chemical analysis, and physical properties equivalent to the original rings.

11. Discs and Wedges

    a. The seating surfaces shall be machined and polished until free of any protrusion or indentation, avoiding irregular finishing. Full contact (100%) shall be obtained on the entire surface.

    b. The taper seal between the disc or wedge and the rings should be adjusted to have a suitable coupling, and the center of the wedge should not be below the valve's centerline. Adjusting **the wedge below the center line is not allowed**.

12. Discs (for safety devices)

    a. Inspect the disc seat for steam cuts, nicks, or other damage.

    b. A disc that is not below minimum relief can be lapped to remove minor damage.

    c. The seating surfaces shall be machined and polished until free of any protrusion or indentation, avoiding irregular finishing.

    d. Do not machine any Thermoflex disc

    e. Full contact (100%) shall be obtained on the entire surface; if the seat step measures less than the dimensions specified, it indicates that the thermal lip has been lapped to the minimum thickness.

Minimum seat relief for orifice size:

#1: 0.004”; #2: 0.005”; #3: 0.006”; #4: 0.008”; #5: 0.007”;

#6: 0.010”; #7(Q): 0.012”; #8: 0.012”; R: 0.12”; RR: 0.012”),

13. Disk holder (for safety devices)

    The surface on the end of the disc holder closest to the disc must be free from steam erosion. The small holes must be opened to ensure the passage of steam to the chamber above the disc. Ensure the outside diameter is not egg-shaped, and the surface is smooth. If any small indication of galling is present, polish the high spots with an emery cloth. If serious or large-scale galling is present, the disc holder should be replaced.

14. Guide (for safety devices)

    Inspect the guide inside diameter for egging, and ensure the inside surface is smooth. The threads on the outside must be in good condition to ensure the upper ring will adjust, even when the valve is hot. If serious or large-scale galling is present, the guide should be replaced.

15. Clearance between Disk holder and Guide (for safety devices)

    The maximum clearance between the disc holder and guide should be in accordance with **Allowable Guide/Disc Holder Clearance** for the valve type and orifice classification.

16. Overlap Collar (for safety devices)

    Inspect the outside diameter for nicks, burrs, tears, pitting, and signs of galling.

    Inspect the lugs galling, tearing, and damage.

17. Cover Plate (for safety devices)

    Ensure that the floating washers are free to move and are not bent or deformed. Check the surface of the inside diameter on the floating washers and the washer retainers for tears, pitting, corrosion, and signs of galling. Ensure that the bleed hole in the coverplate is not obstructed.

18. Grinding the Compression Screw (for safety devices)

For valve designs featuring a compression screw with a spherical radius tip design, the compression screw's spherical bearing surface must be ground into the upper washer so that full contact along the spherical radius is obtained. To grind these items, a 320-grit lapping compound is used for roughing-in, and then the lap is finished with a suitable grade lapping compound (typically between 320 and 600) until a satisfactory bearing band is obtained. Clean the compression screw, and upper spring washer when completed.

19. Grinding the Lower Spring Washer (for safety devices)

    The lower spring washer-bearing surface must be ground to the spindle. To grind the lower spring washer, a 320-grit lapping compound is used for roughing-in, and then the finish lap is with 1000 Grit lapping compound until a satisfactory bearing band is obtained. The bearing width should be 0.125" (3.2 mm) min. to 0.063" (4.8 mm) maximum. Clean the lower spring washer and spindle when complete.

20. Thrust Bearing Surfaces (for safety devices)

    For designs utilizing a ball-type thrust bearing, the aligning washer must match evenly to the lower thrust bearing spherical surface so that full face contact is achieved between the parts. Therefore, grind together or replace the entire thrust bearing, as necessary.

21. Valve Bonnet

    a. After cleaning the valve, non-destructive testing such as liquid penetrant, magnetic particle, or ultrasound test shall be performed to determine the true condition of the bonnet. The Wall thickness shall be measured and documented.

    c. New gaskets and nuts shall be used in the bonnet (in accordance with the classification of the valves). Gaskets and bolts used should be discarded.

    d. The Contractor shall fasten all nuts and bolts to full adjustment.

22. Validation Test

    a. The Contractor shall assemble the valves to make sure all the pieces fit properly. Before doing pressure testing and operation, the Contractor must make sure that all foreign material is removed from the valve, specifically

the area of the valve seat. The repaired valves must successfully complete the test and verification of operation capacity as follows:

i. Wedge, globe, and unidirectional flow valves: tests are performed according to API-598 and API-600 methods. Unidirectional flow swing checks valves are tested in the operating position.

ii. The Contractor must apply pressure to test the performance of the control valves. The Contractor should adjust the stem to make sure that it is in the correct position relative to the input signal. **These tests should be performed with job site operation, instrumentation, and electrical section staff**.

iii. The validation tests for safety devices shall be in accordance with the applicable sections of the latest edition of the Code of Boilers and Pressure Vessels of the American Society of Mechanical Engineers under which they were manufactured and the NB-65 Code of the National Board Inspectors of boilers and pressure vessels.

iv. For valves operated by pilots and after the valve pressure test was completed, the Contractor must test the operation of the pilot several times along the valve opening/closing travel.

During these tests, the stem must move uniformly throughout the travel. The Contract shall provide evidence that you can lock at some point.

b. **Valves that do not meet all the requirements of operation for which they were manufactured, the validation test shall be considered as failed**.

c. All test data must be recorded. Tests shall be performed according to manufacturers' recommendations and ASME Code requirements.

d. **Valves that do not pass the validation tests should be inspected to determine the cause of the failure. The Contractor shall notify the Engineer of all valves that have not passed the test before taking any corrective action**.

e. The Contractor shall notify the Engineer before testing the valves. Testing should not be done without the engineer's prior approval. **The test shall be conducted in the presence of a GeneraPR inspector**.

23. Surfaces Protection

a. All the body and valve yoke shall be painted with aluminum high-temperature paint capable of withstanding 1150°F. A dry finish [finished dry thickness (DFT)] of not less than 5.0 mils is required. If you have not touched the isolation valve, this requirement is waived.

b. Before performing any repair work that is not on this contract's scope of work, the Contractor should have the authorization of the Engineer to approve or disapprove the method of correction or for any other necessary approval.

24. Protection against Corrosion

a. All structural components, screws, and bolts shall be protected against corrosion with the following products or approved equal or better quality:

i. First coating layer: aluminum epoxy mastic Vasallo (9497) and thickness of 4 mils; equal or better.

ii. Second coating layer: white epoxy mastic Vasallo (9496) and thickness of 4 mils; equal or better.

iii. Two coating applications of 2 mils of Urethane (5523) from Sigma Coatings; equal or better

25. Identification (*Tagging*)

a. The Contractor shall implement an effective system of valve marking to adequately stamp each valve repaired.

b. **All repaired valves shall have a stainless-steel tag installed with the following minimum information, but not limited to, written in embossment lettering: valve number, size, working pressure, Contractor company name,** and test date.

c. The information on the repair label for pressure relief valves shall meet the requirements of paragraph 9 of the NB-65 Code of the National Board of Inspectors Boiler and Pressure.

25. Codes, Standards, and Procedures (latest editions) references

a. American Society of Mechanical Engineers (ASME)

b. Boiler and Pressure Vessels Code:

Section I - Power Boilers

Section II - Material Specifications Section IV - Heating Boilers

Section V - Non-Destructive Examination Section VIII - Pressure Vessels

Section IX - Welding and Brazing Qualifications

c. National Board of Boiler and Pressure Vessel Inspectors (NBBI) NB-18: Pressure Relief Device Certifications

NB-23: National Board Inspection Code

NB-65: National Board VR Repair Symbol Administrative Rules and Procedures.

d. American National Standard Institute

ANSI/ASME 16.10 - Face to Face, End to End Dimensions of

Ferrous Valves ANSI/ ASME B16.34 - Valves

ANSI/ASME 10.34 - Steel Valves-Flanged & Butt-Welding Ends ANSI/ASME B 31.1 - Power Piping

ANSI/ASME PTC 25.3 - Safety and Relief Valves

American Petroleum Institute

API 527 - Commercial Seat Tightness of Safety Relief Valves with Metal-to-Metal Seats

API 598 - Valve Inspection and Test" API 600 - Steel Gate Valves"

API 602 - Small Carbon Steel Gate Valves"

API Part II - Recommended Practice for the Design and Installation of Pressure - Relieving Systems in Refineries

API Chapter XVI - Guide for Inspection of Refinery Equipment

- Pressure Relieving Devices

American Society for Non-Destructive Testing ANSI/ASNT CP-189-2016

STN-TC-1A

d. The Contractor shall be responsible of all works related to:

    i. Radiographic test
    ii. Ultrasonic flax
    iii. Preheating
    iv. Post-weld heat treatment

e. The contractor shall submit all procedures required by code to the Engineer.

f. If conflicts or differences are found between codes, standards, or procedures, GeneraPR may choose the more rigorous or conservative one.

27. Documents

a. Copies of documents related to the valve repair shall be submitted to the Engineer upon completion of the work. For safety devices, the Contractor shall follow the requirements of the NB-65 Code of the National Board of Inspectors of Boilers and Pressure Vessels:

    i. Inspection report including all dimensions taken before the valve repair as part of this inspection

    ii. List of all replacement

    iii. Final valve repair report after the valve repair

    iv. Copy of all the data taken in the field

    v. List of works carried out by the Contractor during the repair vi Certifications

    vii. Certifications of the repairs made to the elements of the valves

28. References

a. American Society of Mechanical Engineers Boiler and Pressure Vessels Code"

Section I - Power Boilers

Section II - Material Specifications Section IV - Heating Boilers

Section V - Non-Destructive Examination Section VIII - Pressure Vessels

Section IX - Welding and Brazing Qualifications

F. Valve replacement

If is necessary to replace any welded inline valve, this shall be governed by the applicable code.

G. Valve Cleaning

Contractor shall be responsible of removing and cleaning fuel or chemical materials from the valves.

Final Technical

After the inspection is completed, the Contractor shall provide a written report in pdf format and a hard copy (original and two copies):

1. The report shall include color photographs, written details of the conditions found in all indoor areas (if required) and in the outer areas, recommendations, and procedures used in rehabilitation and repair. At a minimum, the report should contain a schematic detailing the inspected elements, parts to be replaced, parts to be discarded, etc.

2. Once the report is received and approved (or parts of it were approved) by the Power Plant Maintenance Head, the reports shall be used as the basis of the schedule of the work referred to, Scope of the Work, and therefore, part of the Service Contract and will be covered by its guarantee

3. The report shall be performed by technical personnel with experience and recognized expertise.

4. The report shall include but not be limited to the following information:

    a). Summary Report Certification

    "I hereby certify that I am familiar with the information submitted herein and that, based on my inquiry of those individuals immediately responsible for compiling and obtaining the information, the information submitted is true, accurate, and complete. I also certify that all recommendations proposed in this summary report are given based on analytical data and following industry standard engineering procedures and that all activities performed by the company I represent comply with all local and federal environmental laws and occupational, safety, and health laws."

    b). Findings upon Equipment Inspection Prior to Maintenance

    c). Summary of Activities or Works Performed

    d). Summary of Activities or Works Pending

    e). Equipment Spare Parts Replaced

    f). Recommendations

    g). Field Notes and Suporting Documents

    h). Inspection Checklists and Procedures

    i). Drawings Revisions

    j). Employee Qualifications and Training Certifications

To be furnished by Contractor

A. All labor forces and supervision, job administration, and superintendence personnel required, as requested by GeneraPR.

B. Necessary tools, and equipment to perform the scope of work, such as hoists, drills, grinders, air tuggers, chain falls, hydraulic and air jacks, welding machines, ladders, welding equipment, air compressors, tube expansion and cutting machines, wood as required, etc.

C. The Contractor shall provide a movable trailer with the necessary facilities, materials, and tools to serve as a workshop to repair on-site valves that are in operation or out of service at the plant's site. The "trailer" must be in excellent condition, and the safety features will be the responsibility of the contractor.

D. If necessary, workshops located outside the power plants can be used for repairs. Nevertheless, all repairs must be made in compliance with GeneraPR's standards, recommendations, standards of the valve manufacturers, and all applicable codes of the American Society of Mechanical Engineers (ASME) and the National Board of Boiler Inspectors and Pressure Vessels (NBBI).

E. Field office facilities for Contractor's personnel (as applicable).

F. The Contractor shall provide a first aid facility for his personnel as required by OSHA. These arrangements shall be coordinated with and approved by GeneraPR's Safety Oficer at the job site.

G. All other resources or activities needed for performing the job, not furnished by GenaraPR, according to the Scope of Work

H. **All materials and spare parts not provided by GeneraPR .**

I. Safety equipment, such as helmets, welder's jackets, goggles, gloves, etc. A first aid kit is on-site for your workers, according to OSHA regulations.

J. Adequate working uniform and proper identification of Contractor's personnel.

K. The Contractor shall furnish materials and accessories and expendable materials such as cleaning agents, solvents, thread and gasket compounds, greases, wiping cloths, blasting materials, welding rods, drinking cups, ice, paper towels, toilet paper, etc.

L. The Contractor employees assigned to work must always use personal protection and safety equipment such as helmets, welder's jackets, safety glasses or goggles, gloves, and respirators.

M. Fabrication and delivery of parts that were broken in such a way that repair is impossible, and of which there are no replacement spare parts, as applicable.

N. Adequate field facilities and vigilance to keep safe all materials, tools, equipment, and spares, including a movable trailer with all facilities, materials, and tools.

O. Cleaning and painting equipment and material required for painting equipment components and others, as applicable.

P. Transportation of components to and from the shop, as applicable.

Q. All temporary electrical installations to be used for the related activity will be installed by a certified electrician using a ground fault circuit interrupter (GFCI).

To be furnished by GeneraPR

A. Water, service air for pneumatic tools, and electric power 120, 220 volts single phase and 480 three phase volts for tools and require machinery.

B. Those drawings of equipment which are available.

C. Parking facilities, if available.

VI. Estimate Cost:
Estimated cost for Project $100,000.00

VII. Environmental & Historic Preservation ("EHP") Requirements

A. Other than design, planning and non-destructive due diligence studies, no construction work will commence prior to the issuance of specific expressed written FEMA approval for the specific scope of work. FEMA required EHP compliance review will precede the execution of each proposed scope of work submitted by PREPA through its agent Genera PR to FEMA. PREPA through its agent Genera PR is aware of its responsibility for coordinating, notifying, obtaining permits, and complying with applicable federal, state, and local laws, regulations, and executive orders and understands that failure to comply with EHP requirements will jeopardize FEMA funding.

B. See the following for general methods of repair and list of equipment to be used:

a. Dismantle & Salvage
- Complete testing for any containments or hazardous waste.
- All contaminated materials will be delivered to the approved waste disposal as per federal and state laws.
- If the equipment is to be salvaged, it will be loaded and removed from the site.
- All debris will be taken to the approved waste disposal facility as per federal and state laws.

C. List of Equipment to be used but it is not limited to the following:
    - 2 HP Compressor
    - Man lift
    - Forklift

D. Removal of vegetation
    - N/A.

E. List the type of debris:
    - Metal scrap, domestic waste, wood.
    - The debris will be separated and taken to an approved waste disposal facility. Location permits and supporting documentation will be provided at closeout.

F. Description of Staging Area:
    - N/A – only minor equipment staging near the existing equipment to be dismantled and installed.

G. Hazardous Material:

a. Describe the activity and the hazardous material involved. Calculate the quantity to be generated or disposed and include the management and disposal plan.
    - The identified hazardous materials that can be found in the Generation Plant are asbestos, PCBs, Lead, SF6 gas, oil from the transformer & breakers. These hazardous materials, will be handled, and disposed of as per Federal and State Laws.
    - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations
    - These products and their residues will be stored in special covered areas for disposal by an authorized company and provided with temporary spill controls until collected. All paint containers and curing compounds will be tightly sealed and stored

when in use. Excess paint will not be discharged to the storm system, but properly disposed of, according to the manufacturer's instructions.

- Material amounts will be provided by a certified management contractor performing a site evaluation calculation for asbestos and lead paint.
- Prior to the start of any equipment dismantling activities, inspections for the presence of asbestos will be conducted by a trained and certified contractor.
- All asbestos waste found at the Generation Plant will be disposed of at an approved landfill designated by the Department of Environmental Health & Safety. All asbestos waste generated will be bagged and transported in accordance with all applicable State and Federal regulations. There will be no exceptions.
- Any asbestos spills will be cleaned up immediately to prevent the dispersal of fibers. Prudence will be exercised to avoid contamination of laboratory facilities or exposure of personnel to asbestos. Asbestos spills will be cleaned up with wet methods and/or a High-Efficiency Particulate-Air (HEPA) filtered vacuum.

b. If the project includes building demolition with asbestos, provide a copy of the EQB approved plan or evidence of plan submission.

- Not Applicable.

c. If the project includes disposal of damaged transformers or wood poles with creosote, include the management and disposal plan. The plan must include the final disposition site.

- Transformers and pole disposal will be handled as per the Waste Disposal Management Plan. GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
- The removal of the transformer will require testing of the existing oil for PCB's levels, drain oil, and delivery to the approved waste disposal site as per Environmental Regulations.
- Removal of wood poles with creosote treatment will be handled according to the Federal and State Laws.

H. Water Crossings:

a. Specify if the project will affect a waterway or body of water.

- Not Applicable

b. Modification of a body of water or wetland: Does the project require dredging, excavation, disposal of material, adding fill material that might result in any modification of a body of water or wetland designated as "waters of the U.S."?

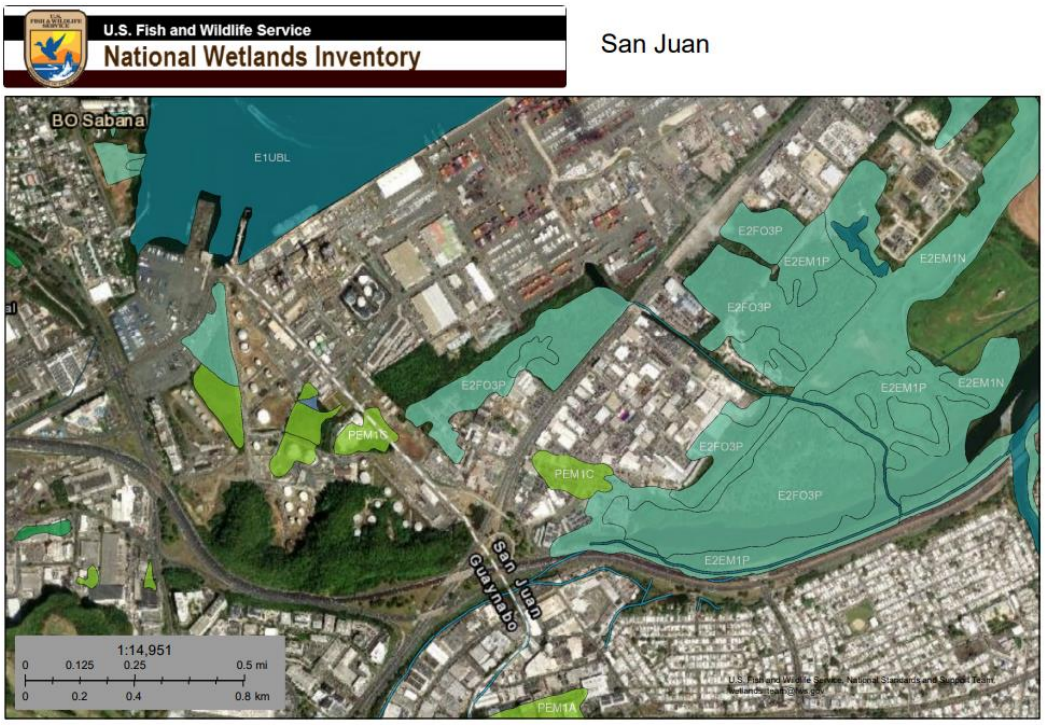
- Not Applicable

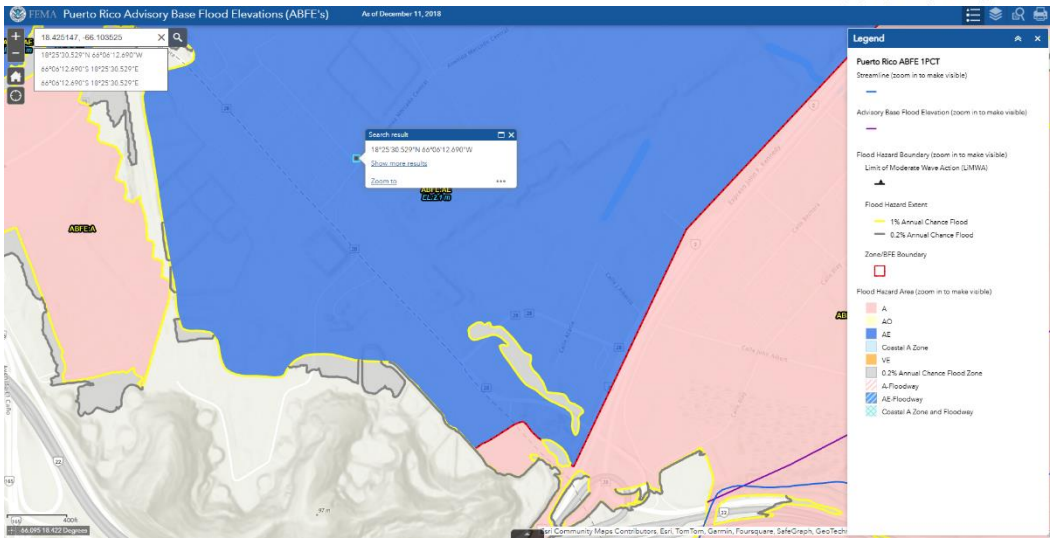
c. Does the project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?

- Not Applicable

d. Flood zone: Is the project located in a flood zone, floodway or will it have a negative impact on the flood zone?

- The Generation Plant is in Flood Zone A (SFHA per ABFE). Equipment replacement only. No negative impact.
- In accordance with the updated version of FEMA Region II Memorandum, dated October 10, 2017, Guidance for the use of Available Flood Hazard Information for the Government of Puerto Rico in complying with FEMA Policy 104-008-2, 44 CFR Part 9, and Executive Order 11988 (Floodplain Management). All hazard mitigation proposals under alternative procedures must be designed using the best available flood hazard data and in compliance with applicable regulations and policy.





American International Plaza
250 Av. Luis Muñoz Rivera, Suite 1200
San Juan, PR 00918

I. Structure Age:

a. Provide the construction date of any buildings or structures within the project. Include those near the project.

- Not Applicable.

b. Provide date and information of any prior repairs, remodeling and/or rehabilitation of the property. Include current and previous use of building or structure.
    - Not Applicable.

c. If a building includes both older and newer sections, confirm which section of the building the work is being done.
    - Not Applicable

d. Include plans, drawings, blueprints, any architectural documentation available for new construction or substantial improvements regardless of the age of the building or structure.
    - Not Applicable

e. Provide at least five color pictures of every structure or building, showing the four facades and the contextual view. Include additional pictures of architectural details. Also provide pictures of buildings (45 years old or older) on the proximities.
    - Not Applicable.

f. Provide an aerial photo map with the GPS coordinates of each structure.
    - If it Apply, if not apply Not Applicable

J. Ground Disturbance

a. Provide a description of the new ground disturbance by giving the dimensions (area, depth, volume, etc.), if any. Include an aerial photo map showing the extent of the disturbance with coordinates.
    - Not Applicable.

b. The project SOW will not affect water or sewer utility services.
c. Indicate the prior/current use of the area to be impacted.
    - Not Applicable. Area is an existing Generation Plant. 100% of the work to be completed will be within the existing and already impacted Generation Plant perimeter.

d. Explain how materials will be stockpiled and disposed of.
    - Not Applicable.
    - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
e. Specify final disposition site.
    - The disposal of materials will be handled as per the Waste Management Plan.

K. Soil Stabilization measures:
a. Does the project involve any soil stabilization measures?
    - No

L. Required Permits

List of the permits needed for Costa Sur Site:

- Environmental Compliance Determination in OGPe
- General Consolidate Permit – OGPe
- Genera will provide proof of all permits as a condition of FEMA Record of environmental considerations.

I. Overview

Project Name:	1.Unit #4 Economizer Water Inlet Valve
	2.Unit #4, Major Repair
Project Type:	428 Detailed SOW
Project Location :	Carretera PR-870, Toa Baja, P.R. 00949
Latitude/Longitude :	18.454764, -66.151414
Version : 0	

II. Introduction

PREPA is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns the power plants for electric generation, transmission, and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 3.4 million people. Genera-PR is the operator authorized under a Public-Private Partnership agreement of the thermal generation facilities of Puerto Rico. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair and improvement. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements.

On September 6, 2017, Puerto Rico's northern coastline was struck by Hurricane Irma, a Category 4 storm. Two weeks later, on September 17, Hurricane Maria tore through the island of Puerto Rico as a Category 5 storm. Subjected to 150+ mph winds and more than 25 inches of rain, 3.4 million residents lost power and

a great deal of infrastructure, including critical facilities, was damaged. In particular, the electrical infrastructure suffered catastrophic impacts. In the aftermath, diligent recovery and reconstruction have been going on, not only to restore the electrical infrastructure to pre-storm function and capacity, but to take this opportunity to bring it in line with current standards and technology. With the recovery funding available, "*Everyone can be sure that we are working responsibly to achieve efficiencies, reduce costs, decommission inefficient and polluting plants, and continue to transform our electrical system for the benefit of our economy and our people*" as Governor Pedro Pierluisi said, this being an opportunity to not just to rebuild the system but to transform it into a smarter, more resilient, and cleaner one. Puerto Rico's generation system must meet customer demand and have adequate additional capacity to comply with the reserve required by the standard operating procedures of the T&D system operator (LUMA). In terms of service continuity, the system must be reliable so that service interruptions are within the margins established in the electrical industry standards.

In 2020 the situation became more complicated when earthquakes events 4473DR-PR provoked more damages to Costa Sur Power Plant. Later, in September 2022, Hurricane Fiona 4671DR-PR also impacted Puerto Rico, destroying even more the already fragile generation assets. Unfortunately, the generation system presents critical performance metrics with a deficiency in capacity to meet the energy demand and the minimum reserve requirements. The forced outage percentage of the units is increasing while the generation capacity decreases. This combination of factors puts the continuity of the service at high risk, adversely affecting the quality of life of those who live in PR.

Genera is responsible for operating and maintaining PREPA's legacy asset generation fleet pursuant to the Generation O&M Agreement. The current fleet condition presents poor performance due to the impact of hurricanes María and Fiona. Generation capacity has been reduced to 46% of installed capacity. In addition, of the generation units in operation, about 32% or 640 MW, are disconnected monthly, causing thousands of customers to suffer interruptions in their service.

The Puerto Rico Electric Power Authority ("PREPA") is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns and operates electric generation, transmission and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 1.5 million customers. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair and improvements. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements. On January 2023, PREPA and the Puerto Rico Public-Private Partnership Authority ("P3 Authority") selected Genera PR, LLC ("Genera") to operate, maintain and modernize the Generation system of PREPA for ten years through a public-private partnership.

To improve the system's reliability, Genera proposes to submit for approval the Detailed Scope of Work (SOW) to COR3 and FEMA for the 662957 under DR-4339-PR Public Assistance. The document provides a description of the project including scope, schedule, and cost estimates as well as Environmental & Historical Preservation ("EHP") requirements.

III. Project Description

PREPA's Generation System Maintenance Program was developed and is being executed using the industry standards, following the equipment's manufacturer maintenance recommendations and PREPA policies. Periodical inspections, tests are performed to identify critical component repairs/replacement in equipment such as boilers, turbines, generators, power transformers, circuit breakers, protection and control relays, grounding mats, and auxiliary equipment.

Genera PR proposes to perform necessary repair and/or replacement of critical generation components pursuant to the Generation O&M Agreement between PREPA, the P3A, and Genera PR.

A detailed SOW version will be submitted to FEMA per facility.

Palo Seco is located on the northern coast of Puerto Rico in the Cataño municipality near San Juan and a location with approx. 36 acres lot, and project is approx. 2.5 acres lot (131,912 ft²). The Plant consists of four thermal steam units, six Hitachi-GE gas turbines (GTs), and three Pratt & Whitney Power Systems (PWPS) FT8 MOBILEPAC GTs with a total nameplate capacity of 809 MW. Palo Seco has been a major generator in the PREPA fleet and continues to serve on a limited basis as current power distribution challenges face the island.

Palo Seco Steam Plant Units 1 and 2 are tangentially fired Combustion Engineering ("CE," now GE Power), heavy fuel oil-fired (HFO-fired) boilers with reheat and a nameplate capacity of 85 MW each. The units are rated 1450 psi, 1000°F, and the boilers are 857.7 MMBtu/h. Unit 1 began commercial operation in 1960, and Unit 2 began commercial operation in 1961.

Palo Seco Steam Plant Units 3 and 4 are tangentially fired CE HFO-fired boilers with a nameplate capacity of 216 MW each. The steam turbines are rated 1800 psi, and the boilers are 1971 MMBtu/h. Additional details about the boilers and turbines were not provided for review. The units began commercial operation between 1967 and 1968.

Genera PR on behalf of Puerto Rico Power Authority respectfully requests to COR3 and FEMA a project for .....

The project location can be seen in Figure 1.

Figure 1: Project Location

IV. Codes and Standards

The following will be referenced when applying specific codes, specifications, and standards to the project design:

- Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR, February 2020.

- Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
- FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
- Rus 1730B - The referenced standards, as defined and as per their requirements, state every system is required to have an Emergency Restoration Plan (ERP) in the event of a major failure or storm event.
- LUMA Operation Reserve Standard - LUMA, as the T&D System Operator, is responsible for ensuring that the system has enough generation resources to function properly. This is also known as resource adequacy. To fulfill this responsibility, LUMA has set a standard for Operational Reserve Capacity. The formula used to determine this capacity is detailed below, with Genera's input in the second column. LUMA may choose to modify the formula or inputs used, such as averages, without input from Genera.

V. General Scope of Work (work to be complete or % work completed)

UNIT 4 – ECONOMIZER INLET VALVE

The Economizer Inlet Valve is the isolation element between the high-pressure boiler feed water system and the boiler inlet. The current valve has been in service nearly fifty (50) years and is past due its expected life span. This is a high energy zone and should be considered as a critical element in this circuit. The scope of work will include the procurement of the valve-actuator combination, removal of the existing valve and installation of the new element. A telescopic crane, special rigging, insulation replacement, pre-heating, Boiler and Pressure Vessel Code welding and post weld heat treatment will be necessary to perform the task. The selected valve based on the operation conditions (1,800 PSIG and 440 °F) should comply with the following specifications:

VALVE

Fluid:	Water (Ultra Clean – Demineralized)
Operating Pressure:	1,800 PSIG
ΔP at Close Position:	1,800 PSIG
Temperature:	440 Deg. F
Type of Connection:	Butt Welded
Size of Connection:	12”
Pressure Rating:	1500
Valve Type:	Stop Globe
Body/Bonnet Style:	Vertical Pressure Seal
Body Material:	WCB/A216
Disc Material:	Cobalt Chromium (CoCr)
Seat Material:	Cobalt Chromium (CoCr)
Steam Material:	410/A479

ACTUATOR

Power:	480 V – 3 Phase – 60 Hz
Features:	Manual Operator (Reduction Gear Transmission)
	Position Feedback (only close/open)

Unit 4 Major Outage Boiler Rehabilitation

1. GENERAL REQUIREMENTS

1. The work shall be executed by qualified personnel with ten years minimum experience in repairs/rehabilitation of boilers and duly recognized in the industry for this type of work, the rehabilitation of boilers as specified in this document. The Contractor will supply all rigging, including I-beams, channels, steel angles, scallop bars, steel plates, spreaders, beams, and hydraulic cylinders. Furthermore, the Proponent shall present evidence of experience in the repair of boiler components or present a specific and highly detailed work plan to perform this work signed by a Professional Mechanical Engineer (PE) with ten years

minimum experience in repairs/rehabilitation of boilers. In this case, a letter from the above-mentioned Engineer stating willingness to assume Quality Control of this project shall be included in the proposal. Also, evidence of experience from the company, key employees, and the Mechanical Engineer shall be presented with the proposal. Experience documentation shall be arranged in a table including but not limited to: Name of the project, date of completion, area (power plant), customer, phone (customer) & work scope. Proposals without these requirements shall be rejected.

2. GeneraPR shall evaluate the experience presented by Proponents based on the following:

A. Level of knowledge shown on past projects on executing the required work.

B. If the projects were completed within the customer time frame required.

C. Work quality

3. The Proponent shall submit in the proposal the current welding procedures and the Procedure Qualification Records (PQR) for evaluation by GeneraPR. Proposals without these requirements shall be rejected.

4. The Proponent shall submit in the proposal the credentials of the company and personnel that will perform the Non-Destructive Tests (NDT) for evaluation by GeneraPR. Proposals without these requirements shall be rejected.

5. All work shall be carried out continuously, following the commencement date specified by GeneraPR, and the proposed work schedule submitted by the Contractor and accepted by GeneraPR. Works shall be completed in ninety (90) calendar days or less. The Contractor shall consider more than one working period to execute the project 24/7. A penalty of $3,000 per extra day will be applied up to fifteen percent (15%) of the total contract amount.

6. The Contractor shall furnish GeneraPR project Management a summary of weekly reports of the works stating the existing status, rate of progress, estimated time of completion, and cause of delays, if any, including the schedule update.

7. Proponent/Contractor shall comply with the minimum salary requirements under Executive Order OE-2022-014 and/or the Davis Bacon Act, whichever is greater.

8. Concurrent to all work, a written weekly report of conditions as found, work performed, clearances, and test data recorded should be submitted. A final report should be submitted within two (2) weeks after completing all work.

9. The Contractor, within fifteen (15) days after receipt of the Notice to Proceed shall submit a schedule of proposed progress and the proposed detailed method of carrying on the Services including a full statement of equipment and equipment layout for the job. This progress chart and statement of operations shall show the dates of commencement and completion of each item of the Services. This schedule shall also include the milestones for the submittals and material ordering, the critical path of the project, and the man-hours per item. The Contractor shall provide for the use of adequate and sufficient equipment and force and a method of operations to assure the completion of the work within allotted time. The schedule shall be weekly actualized and submitted to GeneraPR in Microsoft Project, PDF format and three (3) hard copies in 11 x 17 size.

10. All welding performed under this Contract shall be in accordance with welding procedures which have been qualified with section IX of the ASME Boiler and Pressure Vessel Code and ASME Boiler and Pressure Vessel Code, Section I, Section VIII, Div. 1, Section IX and NBIC Part 3, latest addenda. All welders engaged in work under this Contract shall be qualified in accordance with the test requirements of Section IX of the ASME Boiler and Pressure Vessel Code, welding, and brazing qualifications. The Contractor shall submit the welding procedures and welder's qualifications before the commencement of the work. Each welder's certification shall be on file at the prefabrication shop and available to GeneraPR's inspector upon request. Welding records shall be kept according to

ASME Section 1; Root passes in piping shall be made by the GTAW (Gas Tungsten Arc Welding) process. The balance of the welds may then be completed by using coated electrodes - shield metal arc welding (SMAW) -. Backing rings are not allowed. Preheat and post-heat treatments shall be in accordance with ASME Boiler and Pressure Vessel Code, Section I, Section VIII, Div. 1, Section IX, and NBIC Part 3, latest addenda. Structural steel welding shall be performed by the SMAW method. The welds and weld design preparation shall be according to ASME Boiler and Pressure Vessel Code, Section I, Section VIII, Div. 1, Section IX, and NBIC Part 3, latest addenda. To the extent that they apply, the Contractor shall impose on each of his sub-suppliers/subcontractors the complete requirements of the technical specifications under this Contract. He shall be directly responsible for seeing that the sub-suppliers/sub-contractors are entirely aware of all these requirements and those they abide by.

11. The Contractor shall submit for GeneraPR evaluation and approval the procedure of rigging, removing, and installation of the components as required within these Specifications. Also, the Contractor shall submit for evaluation the Crane Inspection Documents.

12. The Contractor is responsible for opening and closing all necessary accesses to perform the works detailed in the Scope of Work, including removal and reinstallation of any inner or outer casings, tube fins, braces, membranes, vibration baffles, insulation, etc., and any other part attached to boiler tubes.

13. Any cut bevel preparation needed to fit the components described shall be considered part of the Contractor's scope of work.

14. Insulation works by the Contractor.

15. Asbestos and lead abatement by GeneraPR.

16. Any material to be welded to a pressure part shall have the Manufacturer Data Report in compliance with ASME and NBIC latest editions.

17. The Contractor shall supply all necessary equipment to perform the Pre-heat and Post Weld Heat Treatment as specified by the latest ASME Code and NBIC edition.

18. To perform this scope of work, the Contractor shall prepare all required bevels as specified or required.

19. To perform works inside the boiler or in a confined space, the Contractor shall comply with all the requirements under regulations 29 CFR 1910.146 and 29 CFR 1910.269(e) for confined space and enclosed space entry. Before commencement, any work shall be approved by GeneraPR (Plant Safety Officer). The Contractor shall provide a complete working plan, training evidence, and required medical exams for workers who will perform any activity under a confined or closed space environment as required by regulation 29 CFR 1910.146.

20. The contractor shall implement the Foreign Material Entry (FME) Prevention Program. The requirements for this program are the following:

A. Access Control - The requirements for ingress and egress from the designed area. At this point, the people are required to remove the jewelry and all contents of pockets and leave these things with the designed FME clerk or at the assigned area.

B. Tool Control- The method used to ensure that tools are individually marked from other items, identified to the user or worker and storage location, and inventoried at the beginning and end of each task or shift.

C. Clean As You Go- The practice of cleaning assigned tools, parts, equipment, work site, etc., during and at the end of a given task or shift to promote work safety.

2. PRODUCTS, STANDARDS AND QUALITY CONTROL

1. Definitions

A. ASME – American Society of Mechanical Engineers.

B. ASME B&PV Code – ASME Boiler and Pressure Vessel Code.

C. ASNT – American Society for Nondestructive Testing.

D. AWS - American Welding Society.

E. GeneraPR – Genera Puerto Rico individual responsible for the overall management of the project and legal agent representing the Puerto Rico Electric Power Authority (PREPA).

F. ISO - International Organization for Standardization.

G. Manufacturer - The organization that fabricate the raw materials or elements (e.g., tubing, membrane, etc.).

H. Supplier - The organization providing the elements.

2. Reference Industry Standards

A. ASME Boiler & Pressure Vessel Code, Section I, "Rules for Construction of Power Boilers".

B. ASME Boiler & Pressure Vessel Code, Section II, Parts A and B, "Ferrous and Nonferrous Material Specifications".

C. ASME Boiler & Pressure Vessel Code, Section II, Part C, "Specifications for Welding Rods, Electrodes, and Filler Metals".

D. ASME Boiler & Pressure Vessel Code, Section V, "Nondestructive Testing".

E. ASME Boiler & Pressure Vessel Code, Section IX, "Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators".

F. SNT TC-1A, “Personnel Qualification and Certification in Nondestructive Testing".

3. Responsibility

A. The Supplier shall be responsible for fulfilling the requirements set forth in this specification, including all required inspection and testing and submitting all required documentation. GeneraPR shall delineate exceptions to and deviations from this specification in the Vendor’s bid for disposition.

B. The Supplier shall hold a valid “S” Certificate of Authorization issued by the ASME.

C. The Supplier shall provide a Manufacturer’s Partial Data Report (ASME Form P-4).

D. The material or tube Manufacturer shall have a Quality Program in compliance with and certified to ISO 9001.

E. If the Supplier is not the Manufacturer, the Supplier must have a formal program for qualifying their manufacturers and evidence of periodic performance monitoring.

F. The Supplier shall clearly identify all subcontractors intended to be used in their proposal. GeneraPR must approve all subcontractors before issuing a purchase order.

4. Material

A. Tube materials, fabrication, and testing procedures shall comply with ASME SA-450 and the applicable ASME B&PV Code, Section II material specifications.

B. Supplier to furnish either cold-finished or hot-finished tubing. If hot- finished tubing is furnished, the Manufacturer shall meet the applicable ASME SA-450 tolerances for cold-finished tubing.

C. Tubing shall be seamless unless otherwise specified.

D. Membrane, filler bar, and spacer bar dimensions, materials, and type or style shall be as stated in the project specification.

E. The Supplier shall provide certified material test reports (CMTR) for all tubing and welding electrodes (typical deposit analysis is adequate for electrodes). CMTRs shall report chemical and mechanical test data as required by the applicable ASME B&PV Code, Section II material specification. CMTRs shall be prepared in English units or in metric units with conversions to English units.

F. The Supplier shall provide a certification of compliance for membrane material stating the specified material chemistry in accordance with ANSI or other nationally recognized standards.

G. All materials of construction shall be new. Previously used tubing and scrap use is prohibited.

H. All tubing shall be free of injurious mill scale, grit, flaking, rust, etc., prior to fabrication.

5. Welding

A. Welding shall be performed in accordance with the requirements of the ASME B&PV Code, Section I, and the quality control requirements.

B. Welding procedures, welders, and welding operators shall be qualified per the Supplier's Quality Program and the ASME B&PV Code, Section IX.

C. Weld procedure specifications (WPS) and supporting procedure qualification records (PQR) shall be made available to GeneraPR for review prior to the start of fabrication.

D. Copies of all welding operator and welder performance qualifications, along with applicable welder continuity data, shall be made available to GeneraPR for review prior to the start of fabrication.

E. The Supplier shall identify all proposed filler metals to GeneraPR for review and approval prior to the start of fabrication.

F. The following welding practices are prohibited:

a. Backing rings

b. The gas metal arc welding process (GMAW) in the short-circuit in g arc transfer mode.

c. The Flux Cored Arc Welding process (FCAW) without gas shielding.

G. Welding processes shall limit heat input to 60,000 joules/inch maximum. The following formula shall determine heat input:

$$\frac{\text{volts x amps x 60}}{\text{travel speed (in/min.)}} = \frac{\text{Joules}}{\text{inch}}$$

H. All circumferential butt welds shall utilize a gas tungsten arc (GTA) welded root pass unless otherwise approved by GeneraPR.

I. Welding materials utilized for fabrication shall be in accordance with the ASME B&PV Code, Section II, Part C, including the following restrictions:

J. Low carbon ('L' Grade) filler materials are prohibited when welding ferritic materials.

6. Preheat and Post-Weld Heat Treatment

A. The maximum inter-pass temperature shall be 800°F for carbon and low alloy steels.

B. Post-weld heat treatment, if required, shall be performed in accordance with the ASME B&PV Code, Section I, Paragraph PW-39 for the subject tube material grade.

C. For low-alloy steel panels, if straightening is required to meet the requirements of Paragraph 7.5, post-weld heat treatment shall be performed prior to straightening.

D. Post-weld heat treatment shall be performed after bending for carbon steel and low-alloy steel gang-bent panels.

E. The Supplier shall submit the post-weld heat treatment procedure to GeneraPR for review and approval prior to fabrication. Use of localized torches or heating tips is prohibited.

7. Inspection and Testing

A. Non-destructive examination (NDE) procedures shall follow the ASME B&PV Code, Section V. The Supplier shall make all NDE procedures available to GeneraPR for review.

B. Personnel performing NDE shall have Level II qualifications and be certified in accordance with the requirements of SNT TC-1A. The Supplier shall make available all NDE personnel qualifications to GeneraPR for review. Visual inspections may be performed by an AWS Certified Weld Inspector or designated shop QC Inspector.

C. If the specification, codes, laws, ordinances, or any state agency or Authorized Inspector having jurisdiction over the Supplier's shop require any work to be specifically tested or approved, the Supplier shall assume the responsibility and cost thereof and shall give GeneraPR timely notice of its readiness for inspection or testing.

D. Tube wall thickness shall be measured before fabrication on a sample of tubes to confirm that the tubing meets the minimum wall

thickness described in the purchase order. The sample size is determined by Table 1 below.

a. Wall thickness measurements shall be made using the Ultrasonic Pulse-Echo Contact Method in accordance with ASME B&PV Code, Section V, Subsection B, Article 23, SE-797.

b. In lieu of the ultrasonic method described above, micrometer measurements may be taken at each tube end.

c. Readings are to be taken at the 0-, 90-, 180- and 270- degree positions at each end of the tube.

d. Any tube in the sample group found with readings below minimum wall thickness shall cause the entire lot to be rejected. Disposition of the rejected lot shall be discussed and approved by GeneraPR.

Table 1

Lot Size (# of tubes)	Sample Size
1 to 8	Entire Lot
9 to 90	8
Greater than 90	5%

Notes:

1. Lot size is the entire number of tubes provided with the Purchase Order.
2. Each heat of steel provided by the tubing manufacturer must be considered a separate lot.

E. Eddy's current examination shall be performed before fabrication on a sample of tubes to confirm the absence of abrupt imperfections — sample size determined by Table 1 above.

a. Eddy's current testing shall be conducted by Paragraph 24 of ASME SA-450 for carbon and ferritic tubes.

b. Any tube in the sample group found with readings below the minimum wall shall cause the entire lot to be rejected. Disposition of the rejected lot is to be discussed and approved by GeneraPR.

c. If eddy current testing was conducted by the tube Manufacturer and satisfactory results are documented on the tube material CMTR, the eddy recent testing of Section 2.7.D is not required.

F. Visual inspection of tubing shall be performed along the entire length to assure proper surface finish and the absence of any harmful defects, gouges, tears, cracks, flat spots, and kinks, the presence of which shall be cause for rejection. All weld spatter, slag, and flux shall be removed before visual inspection.

G. Visual inspection of all membrane welds shall be performed in addition to the requirements of Paragraph 7.45. Any of the following are unacceptable and grounds for rejection:

a. Cracks

b. Surface undercut greater than 1/32" deep or 10% of wall thickness, whichever is less.

c. Surface porosity.

H. Tube bends shall exhibit good quality and be free of wrinkles, splits, and surface defects.

a. Wall thickness and ovality at the bend sections shall be measured on 10% of the bends.

b. This measurement does not apply to burner panels.

c. For panels whose spacer or wear bars restrict O.D. measurements on both axes, the flattest section accessible shall be measured and compared to the tube nominal OD.

d. Maximum allowable wall thinning shall be 10% of the specified minimum wall thickness.

e. Maximum ovality, defined by the following equation, shall be 10%.

Ovality = [(Major OD – Minor OD) X 100] / Nominal Tube OD

I. Ten percent (10%) of all tubes with a specified minimum wall thickness of less than 0.180" shall be inspected for weld burn- through (as indicated by ID blistering, distortion, or other surface imperfections other than discoloration) using a borescope or equivalent device. All burn-through indications observed during borescope examination shall be considered detrimental to the tubing integrity and rejected. GeneraPR reserve the right to perform a borescope examination of additional tube internal surfaces.

J. All completed panels shall be inspected to ensure the absence of any obstruction or constriction inside the tubes. This shall be done by passing steel balls through the inside diameter of each tube following membrane welding and before the assembly of welded inserts or panel bending. The Supplier shall set up an accountability system to ensure the recovery of all balls inserted into the tubes.

a. Ball Size = 0.9 X (Minimum tube OD – 2 X Maximum Wall Thickness) where:

Minimum tube OD = specified OD – SA-450 tolerance Maximum wall thickness – specified wall + SA-450 tolerance

b. Balls shall be selected from the next smallest commercial size from the result obtained in Paragraph 10.11.1, but not less than 1/16" of the result obtained in Paragraph 10.11.1

K. Twenty percent (20%) of all tube bends, panel membrane welds, and attachment welds on the tension side of gang-bent panels shall be examined by magnetic particle testing. The inspections of tube bends shall be conducted between the bend tangent points. Any of the following are unacceptable and grounds for rejection:

a. Any cracks or linear indications

b. Rounded indications with dimensions greater than 3/16"

c. Four or more rounded indications in a line separated by 1/16" or less, edge to edge.

L.One hundred percent (100%) of all butt welds shall be inspected by radiography.

M. The radiographic examination shall be performed using the single- shot elliptical technique by the ASME B&PV Code, Section V.

N. Radiography acceptance criteria shall conform to the ASME B&PV Code, Section I, PW-51. The radiograph film, copies thereof, or an electronic copy of digital radiographs shall be provided to GeneraPR for review. The film will be returned after review.

O. A hydrostatic test shall be conducted for each tube panel that contains butt welds. Tests shall be performed by the ASME B&PV Code, Section I, at 1.5 times the design pressure. Water used for testing shall not exceed five ppm of chlorides and fluorides. After testing, the assembly shall be drained and air-dried. Air used for drying shall be free from all oil or oil vapors.

P. Final inspections shall be performed before applying any protective coating and capping of the tubes or panels for shipping or storage.

8. Repairs

A. Through-wall defects shall not be repaired by welding. A new tube or tube section shall be installed.

B. When a new tube section is installed, the following applies:

a. Butt welds shall be examined per Sections 2.7.M and 2.7.N.

b. The repair procedure, including welding and NDE procedures, shall be submitted to NRG for approval before repair. NDE shall be by Sections 2.7.A and 2.7.B.

c. The repair shall be documented on an NCR and submitted to GeneraPR for approval.

C. If it becomes necessary to rework the outside surfaces of the tubes due to arc strikes or other physical damage, this shall be done by previously approved methods to maintain the minimum wall thickness. Following re-working, liquid penetrant testing shall be performed to ensure that no harmful defects are left on the pressure boundary of the tubes.

9. Quality Control Requirements

A. The Supplier shall develop and implement a Quality Program to control the quality of all materials and services to be supplied. The Supplier's Quality Program shall be documented by written policies, procedures, and instructions, which, as a minimum, shall comply with the requirements of the codes and standards in Section 2.2 The Supplier's Quality Program shall be submitted to GeneraPR for review and approval with the bid documents.

B. Supplier's Quality Program shall address inspection planning, inspections, inspection personnel, and inspection results and shall include, but not be limited to, the following:

a. The Supplier shall establish a documented, pre-planned inspection program that the Supplier shall use for inspections to be performed at receiving, during storage, during in-process work, upon completion of fabrication, and before shipment.

b. The inspection program shall identify those elements, characteristics, and processes essential for verification by the Supplier's inspection personnel to assure conformance to applicable specifications and drawing requirements.

c. The Supplier shall prepare inspection checklists identifying the specific elements, characteristics, and steps in the process to be inspected and shall include the accept/reject criteria for each. Criteria and recording of inspection results shall be quantitative where possible.

d. The Supplier's inspection checklist or shop traveler shall be submitted to GeneraPR for review, approval, and identification of those inspection activities to be witnessed by GeneraPR. The Supplier shall submit checklists at least four (4) weeks before scheduled inspections to which they apply.

e. The Supplier's utilization of approved inspection checklists does not relieve the Supplier of responsibility for compliance with the contract requirements, specifications, and drawings.

f. The Supplier shall implement the pre-planned inspection program by performing the inspections identified on the checklists and documenting actual inspection observations, measurements, and results. The examination shall be performed and recorded as work

progresses. A copy of the actual results of each inspection shall be submitted to GeneraPR after the work.

g. Supplier personnel performing NDE shall be qualified and certified in accordance with the Supplier's written program. Evidence of their qualification and certification shall be available to GeneraPR for review.

C. The Supplier shall arrange for GeneraPR to have free access to all Supplier's or Supplier's Subcontractor's facilities concerned with the supply or manufacture of materials for the purpose of performing inspection or surveys of parts before or during assembly and to witness any or all fabrication processes, testing, or NDE. The Supplier shall advise GeneraPR of any advance-notice requirements that must be met to access the Supplier's or Supplier's Subcontractor's facilities.

D. Inspection Witness Points will be indicated by GeneraPR on the Supplier's inspection checklist or shop traveler and returned to the Supplier.

E. Supplier shall notify GeneraPR of the expected fabrication start date, expected dates of Witness Point(s), and expected date of final inspection by the Supplier.

F. The Supplier shall provide any documents and copies of or access to all drawings, procedures, or test reports related to the job as deemed necessary by GeneraPR.

G. GeneraPR inspection or surveys at the Supplier's facilities and the Supplier's Subcontractor's facilities may be performed at GeneraPR's discretion. Specific GeneraPR inspections may be identified upon receipt of the Supplier's Quality Program.

H. Supplier shall initiate, disposition, and control Nonconformance Reports (NCRs) to report deficiencies in characteristics, documentation, or

procedures that do not comply with the specification or drawing requirements. Items that can be corrected (reworked) by completion, re-machining, reassembly, or other means to conform to drawing/specification requirements shall be documented by the Supplier on the appropriate inspection checklists. Items that cannot be corrected to the original drawing/specification requirements shall be reported immediately on an NCR. Supplier shall provide recommended disposition for each deficiency and route the NCR form to GeneraPR for review and approval. Upon GeneraPR's approval of the recommended disposition of the NCR, the Supplier shall take the necessary actions to correct the nonconforming item by the disposition on the approved NCR.

I. The Supplier's work shall comply with applicable drawings, specifications, and contract documents. GeneraPR's final acceptance of the Supplier's work shall be based upon satisfactory completion of inspection/tests and resolution of all open or incomplete items.

10. Shipping

A. All weld spatter, mill scale, arc strikes, rust, loose particles, and any potentially harmful foreign matter shall be removed from the completed panels. All sharp edges and roughness shall be ground smooth to a rounded contour. Sponging shall be performed to ensure internal tube cleanliness. Unless otherwise specified in the project specification, preservatives shall not be used on the tube internal surfaces.

B. All completed panels shall be permanently marked with the material designation and size, panel number, Supplier's Job Number, and the GeneraPR Purchase Order Number. This information shall be stamped onto a 1/8" or ten gage carbon steel plate using letters not less than 1/4" in height. Each waterwall panel shall have this identification plate located 18" from either end at the panel centerline. The plate shall be attached to the casing side of the panel by welding to the membrane and not the tubes.

C. Suitable weather protection shall be provided to protect the equipment from damage in transit and during storage for up to six months. Such protection shall include, but not be limited to, applying dealuminate on weld end preps and protective end caps. Capping shall not be done prior to final inspection or release by GeneraPR, as specified in Paragraph 10.17. The method of protection shall be submitted to GeneraPR for review and approval.

11. Documentation

The Supplier's final documentation package shall include the following:

A. Signed P-4 forms

B. Certified material test reports

C. Copy of tube manufacturer's ISO 9001 certification

D. Filler metal identification

E. General arrangement drawings

F. Hydrostatic test certificate of compliance

G. Heat treatment charts or certificate of compliance (when applicable)

H. NDE reports including:

a. Visual/dimensional results

b. Tube wall thickness report

c. Eddy current examination (when applicable)

d. Radiography examination of butt welds (when applicable)

e. Magnetic particle testing (when applicable)

f. Borescope Inspection (when applicable)

I. Repair procedures (when applicable)

J. Nonconformance reports

12. Dimensional Tolerances

Dimension	Tolerance (inches)
Panel Width	+0, -1/4"
Panel Length	±1/8"
Tube Centerline to Centerline	±1/16"
Membrane Recess Length	±1/4"
Membrane Cut Back Length	±1/4"
Membrane Cut Back Width	3/16" max.
Membrane Length	±1/4"
Tube End OD Scarfing	+1/8", -0"
Outside Tube to Outside Tube Center-line	+0", -1/4"
Bowing	±1/4"
Crowning	±1/4"
Membrane Flatness	±1/4"
Panel Squareness	±1/4"
Tube End Parallelism	±1/16"
Tube Ovality (straight tubes only)	2%

A. The inspection definitions and terminology are as follows:

a. Bowing – a measure of the flatness of the panel, top to bottom. Bowing is measured by stretching a tape from one end of the panel to the other on a randomly selected tube of each panel. This measurement shall be done on both the front and back of the panel. The

maximum bowing shall be the most significant distance between the tape and the tube.

b. Crowning – a measure of the flatness of the panel, side to side. Crowning is measured by stretching a tape from the panel's left side tube to the panel's right-side tube. This measurement shall be done on both sides the front and the back of the panel at two different locations along a panel's length. The largest distance between tape and the tube shall be the maximum crowning.

c. Flatness (for bars only) - shall be measured on membrane bars by stretching a tape from one end to the other lengthwise along the bar and perpendicular to the ends. The maximum distance between the tape and the bar shall be the out-of-flatness.

d. Panel Squareness - a combination of how parallel the opposite sides of a panel are to how perpendicular the adjacent sides of the same panel. This condition is achieved when the diagonal distance from panel corners is equal within the tolerance specified.

e. Tube End Parallelism - a measure of the straightness or "saw-toothing" of the tube ends of a panel. This attribute shall be measured by checking the tubes at each corner for squareness (see definition of squareness). Next, stretch a line taut from one side of the panel to the other across the tube faces. The line shall be tangent to the tube faces. The distance from the line to each tube face is the deviation from tube end parallelism.

f. Tube End Squareness - a measure of how closely the tube ends match a right angle. This property shall be measured with a template at two points around the tube end's circumference. The points shall be opposite each other.
g. Tube Ovality - the out-of-roundness of the tube. The measurement shall be made at each end and at the tube center. At the tube ends, the inner diameter shall be checked at four equally spaced

locations. The center of the tube shall be tested for ovality by measuring the outside diameter at four different, equally spaced points.

13. Ambient Operational Conditions

A. Elements will be installed at sea level (on the coast in a hostile and harsh maritime environment) and will operate in a tropical climate zone, at an ambient temperature of 40° C (104° F). It will be operated continuously during a natural year (8,760 hours). This equipment will be operated in an area subject to severe dust and mild salt spray (sea water) due to prevailing winds. And occasionally hurricane winds of up to 150 miles per hour (50 lb/ft2) may originate at the area where it will be installed, and it shall be capable to withstand these winds without damage or negative effects on its operational characteristics.

3. SCOPE OF WORK

To perform all necessary works for the rehabilitation of the Palo Seco Steam Plant Unit #4 Boiler. Contractor shall include all services and materials described hereon, except otherwise explicitly noted.

1. General

A. All labor, materials not provided by GeneraPR, tools, equipment, as crane of the proper capacity, hoists, finger lift, drills, grinders, trailer tractor, chain falls, hydraulic and air jacks, welding machines, ladders, scaffolds, welding equipment, air compressors, tubes expansion, cutting machines, wood, facilities, sanitary facilities, hand wash station, etc.

B. Certified Rigging Plans for each type of maneuver.

C. Full-time safety officer.

D. Full-time Professional Engineer (CIAPR Member & PE License)

E. Full-time (Project Engineer)

F. Fixtures require to restrain and protect the elements from excessive overload during lift and installation.

G. Remove, reinstall and test any boiler part necessary for access.

H. Any thermal insulation removal or installation required to perform the scope of work.

I. All necessary equipment to perform the Pre-heat and Post Weld Heat Treatment and Stress Relieving procedures

J. Mill Test Reports and P4 Forms shall be available and delivered upon request for all applicable material.

K. Field office facilities for Contractor's personnel.

L.Sanitary and first aid facilities for his personnel.

M. Safety equipment, such as helmets, welders' jackets, goggles, gloves, etc.

N. Adequate and proper identification of Contractor's personnel.

O. Materials and accessories, and expendable materials like cleaning agents, solvents, thread and gasket compounds, greases, wiping cloths, blasting materials, welding rod, drinking cups, ice, paper towels, toilet paper, etc.

P. Adequate field facilities and vigilance to keep safe all materials, tools, equipment and spares

Q. GeneraPR-PR will verify completeness of the work required. After the site work is concluded and before authorize demobilization of the contractor, a meeting to report all findings and results of the project shall be performed by the contractor with GeneraPR's representative.

R. While on site, the contractor must keep GeneraPR's representative informed, regarding the progress of work. Furthermore, GeneraPR shall be notified immediately by the contractor about any finding that requires immediate corrective action.

2. Economizer Nose Arch (B-002B)

A. GeneraPR will provide the Economizer Nose Arch panels at site.

B. Remove existing Economizer Nose Arch elements.

a. Parts removed shall be trim to fit into a 20' x 5' recycling dumpster.

C. Prepare and install new Economizer Nose Arch elements.

a. Elements description (supply by GeneraPR):

i. Economizer Nose Arch panels comprising (135) tubes, 2-1/2" OD, 0.200" MWT, SA210-A1 material. Tubes spaced on 3"centers. The panel will extend from elevation 87' to elevation 94' in five (5) sub-panels comprising (27) tubes per sub-panel. The panels shall include a 35° bend with a radius of 16" originating from EL 91'-21/32", tubes adjacent to each sidewall will be loose items. The three tubes at each sidewall shall have bends per Detail "LA" in Combustion Engineering drawing no. F-604-592.

ii. All membrane bar materials will be 1/4" thick carbon steel material and stop 1" from each end. The outside tubes on each panel will be bare, no half width membrane.

iii. The membrane bar will be cut 6" long with 1/4" Dia. Drilled hole at the end of the slot at both ends to aid fit-up of the tube pressure welds.

iv. The panels shall include the cable openings in the same locations.

v. Include 180 linear feet of fin bar 1/4" thick x 1/2" wide, carbon steel material will be shipped loose to be used during the site assembly.

vi. Include 30 linear feet of 1/2″ round stock, carbon steel material shipped loose for use during site assembly.

vii. Include 10 linear feet of fin bar 1/4″ thick x 1″ wide, carbon steel material shipped loose for use during site assembly.

viii. Include 50 feet of scallop bar 1/4″ thick x 2 1/2″ wide, carbon steel material shipped loose for use during site assembly.

ix. Tube field weld ends will be cut and beveled to length

3. Waterwall Tube Panels (B-004B)

A. GeneraPR will provide the Waterwall panels at site.

B. Remove existing Waterwall Panels.

a. Parts removed shall be trim to fit into a 20' x 5' recycling dumpster.

C. Prepare and install new Waterwall panels.

a. Provide and install any required fixture to restrain and protect the elements from excessive overload during lift and installation.

b. Element description (supply by GeneraPR):

i. Each Waterwall panel comprising (30) tubes, 2-1/2" OD, 0.200" MWT, SA210-A1 material. Tubes spaced on 3"centers. The panel will extend from elevation 46' to elevation 56' in two (2) sub-panels comprising (30) tubes per panel.

ii. The panels will be fabricated and shipped in two (2) sub-panels comprising (30) tubes per panel.

iii. All membrane bar materials will be 1/4" thick carbon steel material and stop 1" from each end. The outside tubes on each panel will be bare, no half width membrane.

iv. The membrane bar will be cut 6" long with 1/4" Dia. Drilled hole at the end of the slot at both ends to aid fit-up of the tube pressure welds.

v. Include 60 linear feet of fin bar 1/4" thick x 1/2" wide, carbon steel material will be shipped loose to be used during the site assembly.

vi. Include 25 feet of scallop bar, 1/4″ thick x 2 1/2″ wide, carbon steel material.

vii. Tube field weld ends will be cut and beveled to length.

viii. Pressure Parts Arrangements-Side Elevation DWG F-604-592.

ix. General Arrangements-Sectional Side DWG F-604-596.

4. Air Preheater Rehabilitation

A. Complete set of T-Bar replacement and calibration.

B. Curve Angle inspection and maintenance.

C. Radial and Axial Sector Plates inspection and maintenance.

D. Inspection and repair of the Radial and Axial Statics Seals.

E. Inspection and maintenance of the Radial and Axial Sector Plates Adjusters.

F. Inspection and maintenance of the Rotor Pin Rack. Including liquid penetrant test to welds.

G. Rotor diaphragms and baskets holder's inspection and maintenance.

H. Center Section Inspection and repair.

I. Inspection and repair of Sector Plate cold and hot liners.

J. Guide Bearing internal inspection, cleaning, locking cap bolts inspection, clearance between the adapter sleeve and housing sleeve verification, clearance between outer race and roller verification, new cover assembly gasket removal and installation, replacement of housing packing, oil and filter change.

K. Support Bearing internal inspection, cleaning, visual inspection to the lubrication piping, pump coupling and guide shoe bolts. Housing cover gasket replacement. Visual inspection of housing packing area, replace if necessary. Replace oil and filters.

L.Rotor Drive unit's visual inspection. Multi point lubrication, coupling grid member inspection and lubrication, oil replacement. Replacement of air motor, overrunning clutch and coupling. Repair of casing between rotor drive and low speed gear.

M. Air preheater soot blowers lance inspection. Repair lance cracks and wear nozzles. Reconditioning of lance support structure and rollers.

N. Washing device piping and nozzles maintenance. Inspection of the main insolation valve and check valve, replace if needed.

O. Inspection of the gas and air hot end stainless steel expansion joints, replace if needed.

P. Diaphragms End Plates inspection and repair.

Q. Air Preheaters Outer Casing inspection and repairs.

R. Structural elements and stiffeners inspection and maintenance.

S. Hot and cold connecting plate assembly inspection and repair.

T. Inspection and maintenance of structure in air preheater hanger's connections.

5. Induced Draft Fans Expansion Joint

A. Removal of expansion joints from induce draft fans 3-1 and 3-2.

B. Inspection and repair of flange of expansion joint.

C. Installation of new Glass Reinforced EPDM Belt .25" Thick, 172" X 46"_ 12 (12) V 2", mounting hardware and wide backing bars.

6. Air Preheaters Support Bearing Trunnions Replacement

A. The Contractor needs to remove the Support Beam to replace the cold end trunnions, consider the approximate weight of 275,000# (225,000# the baskets and 50,000# the preheater) and take measurements to return it to the correct location.

B. If the Contractor needs to remove the Air Preheater baskets to complete the Scope of Work, he shall be responsible for keeping the baskets stored in a safe way to reuse after the trunnion replacement. Otherwise, if the Contractor decides to replace the cold end trunnion without removing the baskets, he shall submit to PREPA's representative the structural support design to hold the Air Preheater in place, approved by a Structural Professional Engineer.

C. The Contractor shall perform the Scope of Work without damaging the seals and the Air Preheater components. If the Contractor damages any seal, threads, bolts, gaskets, or any part from the Air Preheaters during

the replacement process, it shall replace the parts without cost to GeneraPR.

D. The Contractor shall perform the Scope of Work in such a way that could reuse all the bearings parts components.

E. If during the trunnion replacement activity, the Contractor needs to cut, arc gauge, or weld to the Air Preheater, the Contractor shall ground the parts to avoid damage to the bearings. Also, the Contractor shall use qualified welders on any weld performed and a Welds QC log to azure they meet the GeneraPR and AWS requirements.

F. After the reassembly, the Contractor shall verify the Support Beam and Air Preheater alignment and trunnion eccentricity concerning the Kingsbury bearing housing.

G. The final report shall include a description of the scope of work performed, photos, and a letter of completion, according to equipment specifications, from the OEM technical advisor.

7. Inspect and Repair Air Preheaters Outer Casing, Ducts and Expansion Joints

A. 250 feet length of expansion joints.

B. 1,500 square feet of repairs for ducts.

8. Technical Advisor Service

A. The contractor shall be responsible for providing Technical Advisor services from the manufacturing company Arvos (Air Preheater Company), which shall be present on-site during part of the installation to have expert installation supervision, establish guidelines and commission the scope of work.

B. The price for the technical advisor service shall be included in the bid price as part of the lump sum price.

C. A letter of acceptable completion of the scope of work from the Technical Advisor shall be included in the final report.

9. Air Preheaters Baskets Replacement (B-003B)

A. GeneraPR will provide all new Air Preheater baskets.

B. Scope is for all basket of the unit, hot and cool sides for both ducts (384 Total).

C. Remove necessary insulation.

D. Remove all existing baskets and transfer to recycling dumpster.

E. Install all new Air Preheater baskets.

F. Replace insulation.

VI. Estimate Cost:

Estimated cost for Project

To be Determined

VII. Environmental & Historic Preservation ("EHP") Requirements

A. Other than design, planning and non-destructive due diligence studies, no construction work will commence prior to the issuance of specific expressed

written FEMA approval for the specific scope of work. FEMA required EHP compliance review will precede the execution of each proposed scope of work submitted by PREPA through its agent Genera PR to FEMA. PREPA through its agent Genera PR is aware of its responsibility for coordinating, notifying, obtaining permits, and complying with applicable federal, state, and local laws, regulations, and executive orders and understands that failure to comply with EHP requirements will jeopardize FEMA funding.

B. See the following for general methods of repair and list of equipment to be used:

a. Dismantle & Salvage
- Complete testing for any containments or hazardous waste.
- All contaminated materials will be delivered to the approved waste disposal as per Disposal Management Plan.
- If equipment is to be salvaged, it will be loaded and removed from the site.
- All debris will be taken to the approved waste disposal facility as per the Waste Management Plan.

C. List of Equipment to be used but it is not limited to the following:
- Crawler Crane
- Semi-truck with low-bed trailer
- Man lift

D. Removal of vegetation
- N/A.

E. List the type of debris:
- Metal scrap, domestic waste, wood.
- The debris will be separated and taken to an approved waste disposal facility. Location permits and supporting documentation will be provided at closeout.

F. Description of Staging Area:

- N/A – only minor equipment staging near the existing equipment to be dismantled and installed.

G. Hazardous Material:

a. Describe the activity and the hazardous material involved. Calculate the quantity to be generated or disposed and include the management and disposal plan.

- The identified hazardous materials that can be found in the Generation Plant are asbestos, PCBs, Lead, SF6 gas, oil from the transformer & breakers. These hazardous materials, will be handled, and disposed of as per Federal and State Laws.
- GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations
- These products and their residues will be stored in special covered areas for disposal by an authorized company and provided with temporary spill controls until collected. All paint containers and curing compounds will be tightly sealed and stored when in use. Excess paint will not be discharged to the storm system, but properly disposed of, according to the manufacturer's instructions.
- Material amounts will be provided by a certified management contractor performing a site evaluation calculation for asbestos and lead paint.
- Prior to the start of any equipment dismantling activities, inspections for the presence of asbestos will be conducted by a trained and certified contractor.
- All asbestos waste found at the Generation Plant will be disposed of at an approved landfill designated by the Department of Environmental Health & Safety. All asbestos waste generated will be bagged and transported in accordance with all applicable State and Federal regulations. There will be no exceptions.

- Any asbestos spills will be cleaned up immediately to prevent the dispersal of fibers. Prudence will be exercised to avoid contamination of laboratory facilities or exposure of personnel to asbestos. Asbestos spills will be cleaned up with wet methods and/or a High-Efficiency Particulate-Air (HEPA) filtered vacuum.

b. If the project includes building demolition with asbestos, provide a copy of the EQB approved plan or evidence of plan submission.

- Not Applicable.

c. If the project includes disposal of damaged transformers or wood poles with creosote, include the management and disposal plan. The plan must include the final disposition site.

- Transformers and pole disposal will be handled as per the Waste Disposal Management Plan. GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
- The removal of the transformer will require testing of the existing oil for PCB's levels, drain oil, and delivery to the approved waste disposal site as per Environmental Regulations.
- Removal of wood poles with creosote treatment will be handled according to the Federal and State Laws.

H. Water Crossings:

a. Specify if the project will affect a waterway or body of water.

- Not Applicable

b. Modification of a body of water or wetland: Does the project require dredging, excavation, disposal of material, adding fill material that might result in any modification of a body of water or wetland designated as "waters of the U.S."?

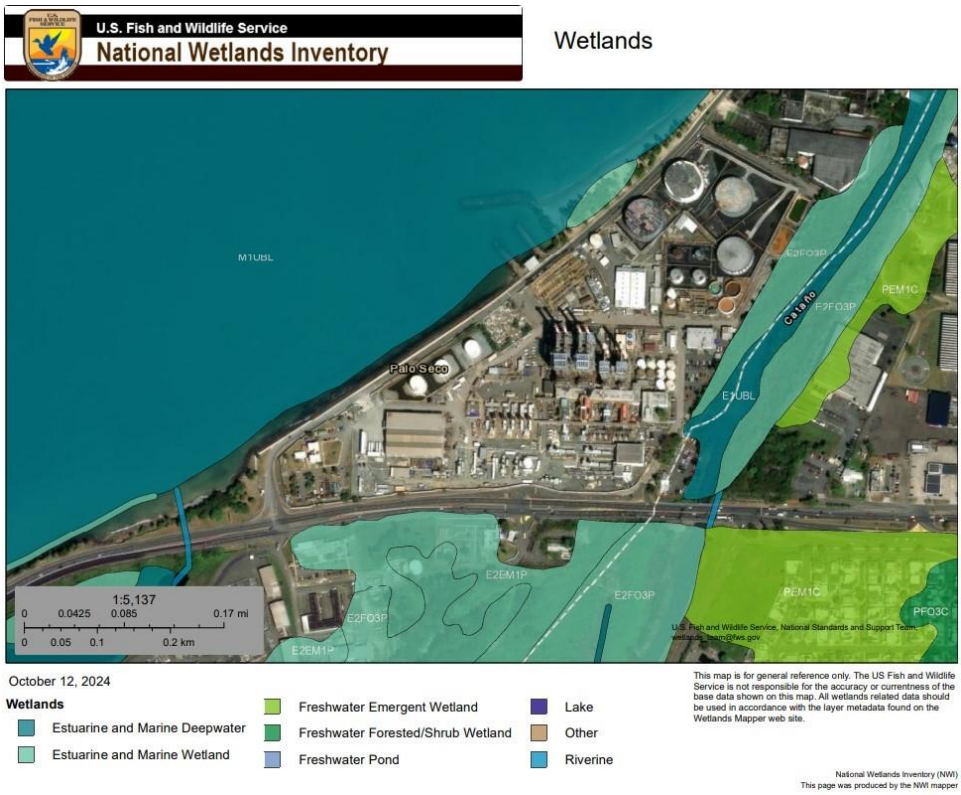
- Not Applicable

c. Does the project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?

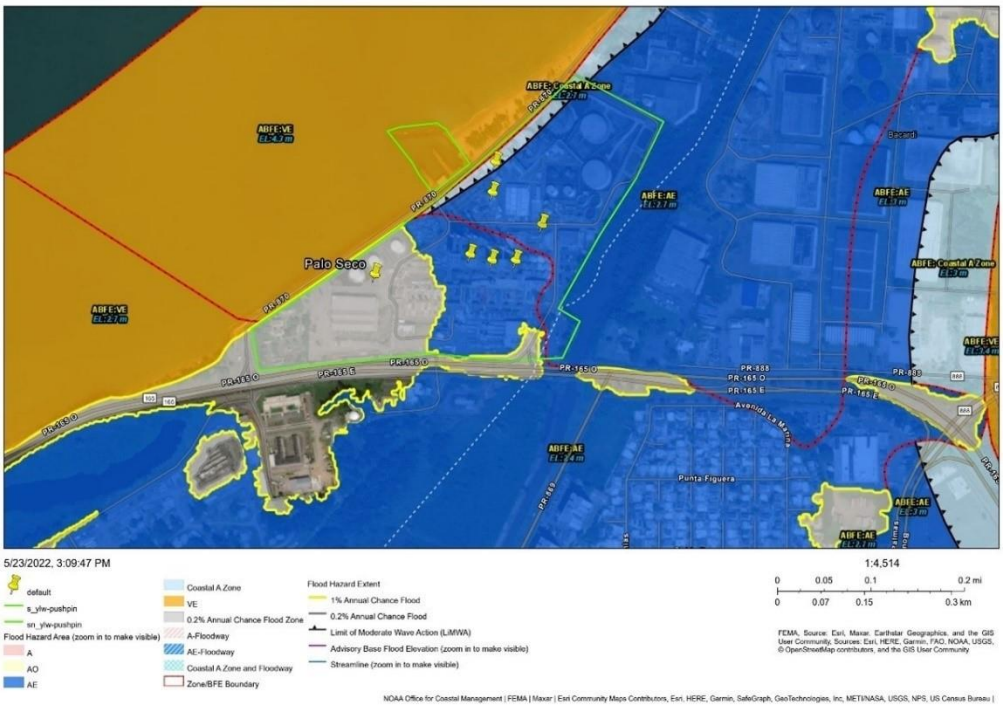
- Not Applicable

d. Flood zone: Is the project located in a flood zone, floodway or will it have a negative impact on the flood zone?

- The Generation Plant is in Flood Zone A (SFHA per ABFE). Equipment replacement only. No negative impact.
- In accordance with the updated version of FEMA Region II Memorandum, dated October 10, 2017, Guidance for the use of Available Flood Hazard Information for the Government of Puerto Rico in complying with FEMA Policy 104-008-2, 44 CFR Part 9, and Executive Order 11988 (Floodplain Management). All hazard mitigation proposals under alternative procedures must be designed using the best available flood hazard data and in compliance with applicable regulations and policy.



Floodplains



I. Structure Age:
   a. Provide the construction date of any buildings or structures within the project. Include those near the project.
      - Not Applicable.

b. Provide date and information of any prior repairs, remodeling and/or rehabilitation of the property. Include current and previous use of building or structure.
   - Not Applicable.

c. If a building includes both older and newer sections, confirm which section of the building the work is being done.
   - Not Applicable

d. Include plans, drawings, blueprints, any architectural documentation available for new construction or substantial improvements regardless of the age of the building or structure.

- Not Applicable

e. Provide at least five color pictures of every structure or building, showing the four facades and the contextual view. Include additional pictures of architectural details. Also provide pictures of buildings (45 years old or older) on the proximities.
   - Not Applicable.

f. Provide an aerial photo map with the GPS coordinates of each structure.
   - Not Applicable.

J. Ground Disturbance

a. Provide a description of the new ground disturbance by giving the dimensions (area, depth, volume, etc.), if any. Include an aerial photo map showing the extent of the disturbance with coordinates.
   - Not Applicable.

b. The project SOW will not affect water or sewer utility services.

c. Indicate the prior/current use of the area to be impacted.
   - Not Applicable. Area is an existing Generation Plant. 100% of the work to be completed will be within the existing and already impacted Generation Plant perimeter.

d. Explain how materials will be stockpiled and disposed of.
   - Not Applicable.
   - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.

e. Specify final disposition site.
   - The disposal of materials will be handled as per the Waste Management Plan.

K. Soil Stabilization measures:

a. Does the project involve any soil stabilization measures?
   - No

I. Overview

Project Name:	DR4339 663383-Repair of Diesel Tank No. 2 Cambalache Power Plant
Project Type:	428 Detailed Scope of Works
Project Location :	Carretera 681 Cambalache Arecibo, PR 00612
Latitude/Longitude :	18.47101, -66.69963
Version : 0	

II. Introduction

PREPA is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns the power plants for electric generation, transmission, and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 3.4 million people. Genera-PR is the operator authorized under a Public-Private Partnership agreement of the thermal generation facilities of Puerto Rico. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair and improvement. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements.

On September 17, Hurricane Maria tore through the island of Puerto Rico as a Category 5 storm. Subjected to 150+ mph winds and more than 25 inches of rain, 3.4 million residents lost power and a great deal of

infrastructure, including critical facilities, was damaged. In particular, the electrical infrastructure suffered catastrophic impacts. In the aftermath, diligent recovery and reconstruction have been going on, not only to restore the electrical infrastructure to pre-storm function and capacity, but to take this opportunity to bring it in line with current standards and technology. With the recovery funding available, "*Everyone can be sure that we are working responsibly to achieve efficiencies, reduce costs, decommission inefficient and polluting plants, and continue to transform our electrical system for the benefit of our economy and our people*" as Governor Pedro Pierluisi said, this being an opportunity to not just to rebuild the system but to transform it into a smarter, more resilient, and cleaner one. Puerto Rico's generation system must meet customer demand and have adequate additional capacity to comply with the reserve required by the standard operating procedures of the T&D system operator (LUMA). In terms of service continuity, the system must be reliable so that service interruptions are within the margins established in the electrical industry standards.

Unfortunately, the generation system presents critical performance metrics with a deficiency in capacity to meet the energy demand and the minimum reserve requirements. The forced outage percentage of the units is increasing while the generation capacity decreases. This combination of factors puts the continuity of the service at high risk, adversely affecting the quality of life of those who live in PR.

Genera is responsible for operating and maintaining PREPA's legacy asset generation fleet pursuant to the Generation O&M Agreement. The current fleet condition presents poor performance due to the impact of hurricanes María and Fiona. Generation capacity has been reduced to 46% of installed capacity. In addition, of the generation units in operation,

about 32% or 640 MW, are disconnected monthly, causing thousands of customers to suffer interruptions in their service.

The Puerto Rico Electric Power Authority (“PREPA”) is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns and operates electric generation, transmission and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 1.5 million customers. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair and improvements. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements. On January 2023, PREPA and the Puerto Rico Public-Private Partnership Authority (“P3 Authority”) selected Genera PR, LLC (“Genera”) to operate, maintain and modernize the Generation system of PREPA for ten years through a public-private partnership.

To improve the system's reliability, Genera proposes submitting for approval the Detailed Scope of Work (SOW) to COR3 and FEMA for Diesel Tank No. 2 under DR-4339-PR 428 Public Assistance. The document provides a description of the project including scope, schedule, and cost estimates as well as Environmental & Historical Preservation ("EHP") requirements.

The project location can be seen in Figure 1.

Figure 1: Project Location

III. Project Description

PREPA's Generation System Rehabilitation Program was developed and is being executed using the industry standards, following the equipment's manufacturer recommendations and PREPA policies. Periodical inspections and tests are performed to identify critical component repairs/replacement in equipment such as boilers, turbines, generators, power transformers, circuit breakers, protection and control relays, grounding mats, and auxiliary equipment.

Genera PR proposes to perform necessary repair and/or replacement of critical generation components pursuant to the Generation O&M Agreement between PREPA, P3A, and Genera PR.

A detailed SOW version will be submitted to FEMA per facility.

Cambalache Power Plant is in the northern part of Puerto Rico in the Arecibo municipality and is owned and operated by PREPA and location is 21.2 acres. The Plant consists of three simple-cycle Alstom (now General Electric [GE] Power) gas turbines (GT), each with a nameplate capacity of 82.5 MW; it began operation between 1997 and 1998.

Cambalache Power Plant is arranged in parallel simple cycle units. Each turbine is coupled to a dedicated generator and is rated at 82.5 MW when firing low sulfur distillate oil No. 2. The units were commissioned in 1997–1998 to improve the quality and reliability of PREPA's electrical system and can operate base loaded or with up to 60% rapid spinning reserve. The GT equipment and facilities are dedicated to support the operation of the simple-cycle plant with redundancy and unit-specific systems for independent operation as required.

Genera PR, on behalf of Puerto Rico Power Authority respectfully requests COR3 and FEMA a project for the rehabilitation of the Diesel Tank No. 2.

IV. Codes and Standards

The following will be referenced when applying specific codes, specifications, and standards to the project design:

- Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR, February 2020.

- Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
- FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
- Rus 1730B - The referenced standards, as defined and as per their requirements, state every system is required to have an Emergency Restoration Plan (ERP) in the event of a major failure or storm event.
- LUMA Operation Reserve Standard - LUMA, as the T&D System Operator, is responsible for ensuring that the system has enough generation resources to function properly. This is also known as resource adequacy. To fulfill this responsibility, LUMA has set a standard for Operational Reserve Capacity. The formula used to determine this capacity is detailed below, with Genera's input in the second column. LUMA may choose to modify the formula or inputs used, such as averages, without input from Genera.

V. Scope of Work

All the proposed work will be conducted within the mentioned plot area, which is demarcated in the provided site Map. Cambalache Power Plant is surrounded by a dike. This doesn't allow storm water to flow to a natural body of water. The ground works that will be conducted at this facility include clearing and grubbing, demolition, excavation, cleaning, and disposition of the surplus material among others. Actual excavation depths will be defined further in the design process, however, by current standard and codes, the typical depth range shall vary between 1 to 5 FT depending on the groundwork to be performed.

The type of work designation is considered initial and is based on currently available information. The type of work designation may be revised based on design drawings and technical specifications progress.

The scope of works covers the rehabilitation work of the Diesel Fuel Tank D-2 at the Cambalache Generation Plant. The scope includes but is not limited to the (D=122'; H=50') tank's interior and exterior mechanical works, interior and exterior surface preparation and coating application, rehabilitation of tank's dike HDPE Liner, and final technical report.

Project includes the tank's interior and exterior surface preparation and anticorrosive coating system application on the entire exterior and part of the interior of the tank. The interior application includes columns, rafters, shells, tank bottom and roof. The exterior application includes shells, roofs, manholes, stairs, nozzles, wind-girders, piping and piping supports.

The lead inspection shall be conducted prior to any activities taking place. If necessary, lead abatement of existing surfaces will be performed.

Gases removal before construction activities ie. Welding, cleaning, painting, will be performed.

1. Perform 14 SY. of DEMOLITION of 12 IN DIA Pipe supports
   Location: Start 18.470884, -66.700406 End 18.470804, -66.700498
   Material: Reinforced concrete
   Ground Area: 4 ea. x 10 FT long x 2 FT wide = 80 SF (0.001836 acres)
   Waste volume: 4 ea. x 3 FT high x 2 FT wide x 10 FT long = 240 cubic feet = 9 CM
2. Repair of 190 LF connection welds inside the 12 IN DIA pipes

Existing Tank Specs:
Location Coordinates: 18.470800, -66.700892
Tank Material: Steel Metal
Tank Dimensions: 122 FT DIA x 50 FT (H)

Tank Exterior

3. Remove and replace 1 EA of 24 IN DIA manhole flange 1/4" in thick C.S ASTM A36. **See included drawing from the company CBI (24 Dia. API 650 / ROOF MANHOLE) DWG. No.25, for specific details. The connections will be made by welding.**
4. Remove and replace 2 EA. of Fire Arresters Flanges See included drawing of the company CBI (10 Day ROOF NOZZLE) DWG. No.26, for specific details. The connections will be made by welding.
5. Remove and replace 1 EA of Spotlights system
6. Repair of 384 LF of connection welds between the roof and the circumferential stop angle of the tank envelope and between the overlapping roof plates
7. Install 384 LF of polyurethane seal between the tank bottom chine and the concrete base
8. Remove and replace 384 LF of railings
9. Remove and replace 6 EA of railings supports connection plates
10. Remove and replace 384 LF of handrails
11. Remove and replace 384 LF of safety platform
12. Remove and replace 384 LF of FRP polymer gratings
13. Remove and replace 25 LF of 4 IN DIA Sch 40 riser pipe (screws, nuts and/or studs)
14. Remove and replace 1 EA Flange 150#
15. Installation 24 IN of 8 IN DIA Sch. 40 tube wind girder casings

16. Install 3 EA of 20 IN wide x 36 IN long Lap-welded patch plates in the Wind-Girder area
17. Remove and replace 10 EA of 18 In wide x 12 FT long x ¼ IN thick lap-welded patch plates in the wind girder area
18. Remove and replace a section of 60 LF x 3 IN wide of the wind girder
19. Remove and replace 12 EA of wind girder brackets
20. Remove and replace 10 EA of wind girder back up bars
21. Remove and replace 10 EA of welded patch plates 8 IN wide x 3/16 IN thick
22. Install 3 EA of 20 IN x 36 IN x 1/4 IN thick lap-welded patch plates in the wind girder area
23. Install 760 SF of ¼ IN thick lap-welded patch plates in the roof area. All connections will be by welding
24. Install 1 EA. of 12 IN x 48 IN lap-welded patch plates.
25. Install 1 EA. of 12 IN x 32 IN lap-welded patch plates.
26. Install 1 EA. of 12 IN x 96 IN lap-welded patch plates.
27. Install 2 EA. of 12 IN x 48 IN lap-welded patch plates.
28. Prepare/Paint 50 LF of Fire Suppression Piping. 12 in Diameter with SIKAFlex-1a / White color coating
29. Prepare/Paint 19,163 SF of Tank Shell with SIKAFlex-1a / White color coating
30. Prepare/Paint 4,000 SF of Accessories (Manholes, Nozzles, Stairs, Vents, Valves)
31. Install 4 EA. of lettering

Tank Interior

32. Repair 150 LF of 5/16 IN fillet weld in the overlapping floor plates, connection between floor and walls, and in the annular plates
33. Repair 4 EA clip bars at the base of the central column
34. Install 5 EA of 24 IN long x 12 IN wide x ¼ IN thick patch plates in the interior floor
35. Install 33 EA of 12 IN long x 12 IN wide x ¼ IN thick patch plates in the interior floor

36. Repair 35 LF of welding in the tank floor pitted area
37. Repair 75 IN of welding in the 24 IN DIA manhole
38. Install 30 EA of 6 IN DIA and ¼ IN thick lap-welded patch plates in the ceiling area. All connections will be by welding
39. Install 5 EA. of 12 IN x 12 IN lap-welded patch plates in the ceiling area. All connections will be by welding
40. Remove and replace the level system See included drawing of the company CBI (TANK LEVEL GAUGE)
41. Prepare/Paint 11,689 SF of Tank Bottom
42. Prepare/Paint 3,833 SF of Tank Interior Walls
43. Prepare/Paint 11,689 SF of Tank Ceiling
44. Prepare/Paint 4,270 SF of Tank Ceiling Rafters
45. Prepare/Paint 33.2 SF of Column
46. Perform 1 EA of non-destructive testing in compliance with API-653 for the tank repair

Project Cost Estimate: $ 2,000,000.00

VI. Environmental & Historic Preservation ("EHP") Requirements

A. Other than design, planning and non-destructive due diligence studies, no construction work will commence prior to the issuance of specific expressed written FEMA approval for the specific scope of work. FEMA requested EHP compliance review will precede the execution of each proposed scope of work submitted by PREPA through its agent Genera PR to FEMA. PREPA through its agent Genera PR is aware of its responsibility for coordinating, notifying, obtaining permits, and complying with applicable federal, state, and local laws, regulations, and

executive orders and understands that failure to comply with EHP requirements will jeopardize FEMA funding.

B. See the following for general methods of repair and list of equipment to be used:

a. Dismantle & Salvage

- Complete testing for any containments or hazardous waste.
- All contaminated materials will be delivered at the approved waste disposal as per the Disposal Management Plan.
- If the equipment is to be salvaged, it will be loaded and removed from the site.
- All debris will be taken to the approved waste disposal facility as per the Waste Management Plan.

C. List of Equipment to be used but it is not limited to the following:

- Crawler Crane
- Semi-truck with low-bed trailer
- Man lift

D. Removal of vegetation

- Construction will be done on the same pre-existing tank location

E. List the type of debris:

- Metal scrap, domestic waste, wood, concrete
- The debris will be separated and taken to an approved waste disposal facility. Location permits and support documentation will be provided close-out.

F. Description of Staging Area:

- The staging area will be located near the existing equipment to be dismantled and installed.

G. Hazardous Material:

a. Describe the activity and the hazardous material involved. Calculate the quantity to be generated or disposed and include the management and disposal plan.

- The identified hazardous materials that can be found in the Generation Plant are asbestos, PCBs, Lead, SF6 gas, oil from the transformer & breakers. These hazardous materials will be handled and disposed of as per Federal and State Laws.
- GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations
- These products and their residues will be stored in special covered areas for disposal by an authorized company and provided with temporary spill controls until collected. All paint containers and curing compounds will be tightly sealed and stored when in use. Excess paint will not be discharged to the storm system, but properly disposed of, according to the manufacturer's instructions.
- Material amounts will be provided by a certified management contractor performing a site evaluation calculation for asbestos and lead paint.

- Prior to the start of any equipment dismantling activities, inspections for the presence of asbestos will be conducted by a trained and certified contractor.
- All asbestos waste found at the Generation Plant will be disposed of at an approved landfill designated by the Department of Environmental Health & Safety. All asbestos waste generated will be bagged and transported in accordance with all applicable State and Federal regulations. There will be no exceptions.
- Any asbestos spills will be cleaned up immediately to prevent the dispersal of fibers. Prudence will be exercised to avoid contamination of laboratory facilities or exposure of personnel to asbestos. Asbestos spills will be cleaned up with wet methods and/or a High-Efficiency Particulate-Air (HEPA) filtered vacuum.

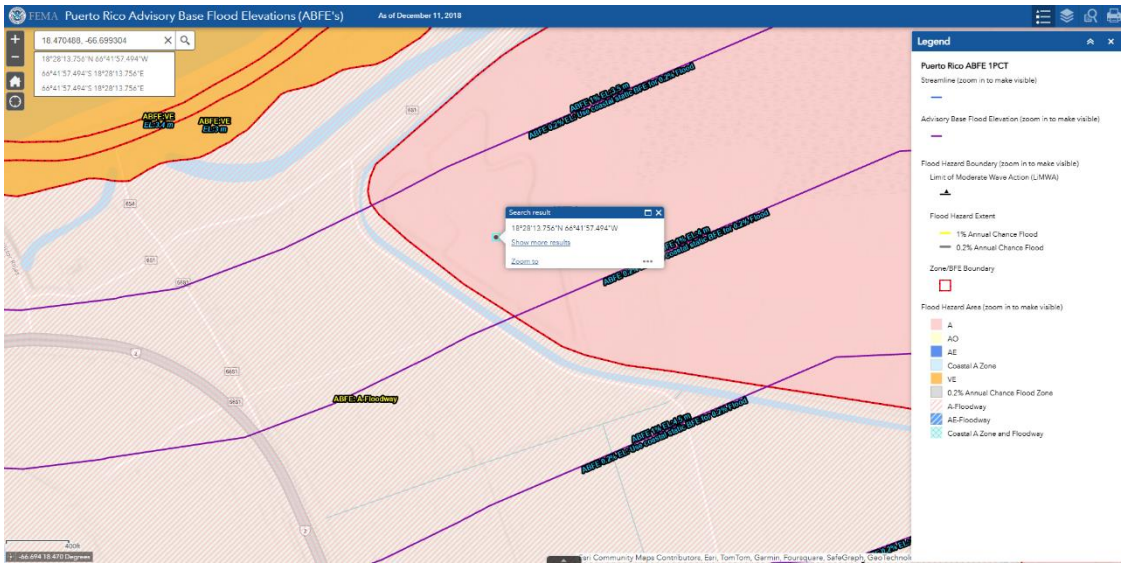
b. If the project includes building demolition with asbestos, provide a copy of the EQB approved plan or evidence of plan submission.
    - To be provided. If applies
c. If the project includes disposal of damaged transformers or wood poles with creosote, include the management and disposal plan. The plan must include the final disposition site.
    - Transformers and pole disposal will be handled as per the Waste Disposal Management Plan. GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
    - The removal of the transformer will require testing of the existing oil for PCB's levels, drain oil, and delivery to

the approved waste disposal site as per Environmental Regulations.

- Removal of wood poles with creosote treatment will be handled according to the Federal and State Laws.

H. Water Crossings:
   a. Specify if the project will affect a waterway or body of water.
      - Generation Plant site is surrounded by an existing dike. PLAN CES will be provided
   b. Modification of a body of water or wetland: Does the project require dredging, excavation, disposal of material, adding fill material that might result in any modification of a body of water or wetland designated as "waters of the U.S."?
      - Generation Plant site is surrounded by an existing dike. PLAN CES will be provided
   c. Does the project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?
      - Generation Plant site is surrounded by an existing dike. PLAN CES will be provided
   d. Flood zone: Is the project located in a flood zone, floodway or will it have a negative impact on the flood zone?
      - The Generation Plant is in Flood Zone A (SFHA per ABFE). No negative impact.
      - In accordance with the updated version of FEMA Region II Memorandum, dated October 10, 2017, Guidance for the use of Available Flood Hazard Information for the Government of Puerto Rico in complying with FEMA Policy 104-008-2, 44 CFR Part 9, and Executive Order 11988 (Floodplain Management). All hazard mitigation proposals under alternative procedures must be

designed using the best available flood hazard data and in compliance with applicable regulations and policy.



American International Plaza
250 Av. Luis Muñoz Rivera, Suite 1200
San Juan, PR 00918

I. Structure Age:
   a. Provide the construction date of any buildings or structures within the project. Include those near the project.
      - Not Applicable.
   b. Provide date and information of any prior repairs, remodeling and/or rehabilitation of the property. Include current and previous use of building or structure.
      - Not Applicable.
   c. If a building includes both older and newer sections, confirm which section of the building the work is being done.
      - Not Applicable
   d. Include plans, drawings, blueprints, any architectural documentation available for new construction or substantial improvements regardless of the age of the building or structure.
      - To be provided
   e. Provide at least five color pictures of every structure or building, showing the four facades and the contextual view. Include additional pictures of architectural details. Also provide pictures of buildings (45 years old or older) in proximity.
      - Not Applicable.
   f. Provide an aerial photo map with the GPS coordinates of each structure.
      - Provided in Figure 1

J. Ground Disturbance
   a. Provide a description of the new ground disturbance by giving the dimensions (area, depth, volume), if any. Include an aerial photo map showing the extent of the disturbance with coordinates.
      - Provided in the Scope of Work

   b. The project SOW will not affect water or sewer utility services.

c. Indicate the prior/current use of the area to be impacted.
    - The area is an existing Generation Plant. 100% of the work to be completed will be within the existing and already impacted Generation Plant perimeter.

d. Explain how materials will be stockpiled and disposed of.
    - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.

e. Specify final disposition site.
    - The disposal of materials will be handled as per the Waste Management Plan.

K. Soil Stabilization measures:

a. Does the project involve any soil stabilization measures?
    - No

L. Required Permits

List of the permits needed for Camabalache Site: Permits may include but are not limited to:

- Environmental Compliance Determination in Oficina de Gerencia de Permisos (OGPe)
- General Consolidate Permit – OGPe
- Genera Will provided proof of all permits as a Condition of FEMA Record of Environmental Considerations (REC).

I. Overview

Project Name:	1.HOT INSPECTION 4A, 2.Repair & Replacement Combustor Components Unit 2B, 3. Repair & Replacement Combustor Components Unit 3A
Project Type:	428 Detailed Initial Scope of Works
Project Location :	Carretera #2 interior 3341 Bo. Mani Mayagüez PR 00682
Latitude/Longitude :	18.219464, -67.160675
Version : 0	

II. Introduction

PREPA is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns the power plants for electric generation, transmission, and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 3.4 million people. Genera-PR is the operator authorized under a Public-Private Partnership agreement of the thermal generation facilities of Puerto Rico. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas

of repair and improvement. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements.

On September 17, Hurricane Maria tore through the island of Puerto Rico as a Category 5 storm. Subjected to 150+ mph winds and more than 25 inches of rain, 3.4 million residents lost power and a great deal of infrastructure, including critical facilities, was damaged. In particular, the electrical infrastructure suffered catastrophic impacts. In the aftermath, diligent recovery and reconstruction have been going on, not only to restore the electrical infrastructure to pre-storm function and capacity, but to take this opportunity to bring it in line with current standards and technology. With the recovery funding available, "*Everyone can be sure that we are working responsibly to achieve efficiencies, reduce costs, decommission inefficient and polluting plants, and continue to transform our electrical system for the benefit of our economy and our people*" as Governor Pedro Pierluisi said, this being an opportunity to not just to rebuild the system but to transform it into a smarter, more resilient, and cleaner one. Puerto Rico's generation system must meet customer demand and have adequate additional capacity to comply with the reserve required by the standard operating procedures of the T&D system operator (LUMA). In terms of service continuity, the system must be reliable so that service interruptions are within the margins established in the electrical industry standards.

Unfortunately, the generation system presents critical performance metrics with a deficiency in capacity to meet the energy demand and the minimum reserve requirements. The forced outage percentage of the units is increasing while the generation capacity decreases. This combination of factors puts the continuity of the service at high risk, adversely affecting the quality of life of those who live in PR.

Genera is responsible for operating and maintaining PREPA's legacy asset generation fleet pursuant to the Generation O&M Agreement. The current fleet condition presents poor performance due to the impact of hurricanes María and Fiona. Generation capacity has been reduced to 46% of installed capacity. In addition, of the generation units in operation, about 32% or 640 MW, are disconnected monthly, causing thousands of customers to suffer interruptions in their service.

The Puerto Rico Electric Power Authority (“PREPA”) is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns and operates electric generation, transmission and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 1.5 million customers. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair and improvements. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements. On January 2023, PREPA and the Puerto Rico Public-Private Partnership Authority (“P3 Authority”) selected Genera PR, LLC (“Genera”) to operate, maintain and modernize the Generation system of PREPA for ten years through a public-private partnership.

To improve the system's reliability, Genera proposes submitting for approval the Detailed Scope of Work (SOW) to COR3 and FEMA for the Inspection and Reparation of 4 Generator Mayaguez Generation Plant under DR-4339-PR 428 Public Assistance. The document provides a description of the project including scope, schedule, and cost estimates as well as Environmental & Historical Preservation ("EHP") requirements.

The project location can be seen in Figure 1.

Figure 1: Project Location

III. Project Description

PREPA's Generation System Program was developed and is being executed using the industry standards, following the equipment's manufacturer recommendations and PREPA policies. Periodical inspections, tests are performed to identify critical component repairs/replacement in equipment such as boilers, turbines, generators, power transformers, circuit breakers, protection and control relays, grounding mats, and auxiliary equipment.

Genera PR proposes to perform necessary repair and/or replacement of critical generation components pursuant to the Generation O&M Agreement between PREPA, P3A, and Genera PR.

A detailed SOW version will be submitted to FEMA per facility.

Mayagüez is located in the El Seco section, Mayagüez, on the western coast of Puerto Rico. At Mayagüez, eight Pratt & Whitney® (P&W) FT8-3 aero-derivative simple-cycle gas turbines went into service between 2008 and 2009 (in Fiscal Year 2009). The gas turbines (GTs) are configured in sets of two driving electrical generator unit. The four electrical generating units in total have a nameplate capacity of 220 MW. As of April 25, 2021, Units 1A and 1B were out of service and in a forced outage. Additionally, Unit 4A was out of service due to cracks in the combustor area. Their return to service date was pending. The aeroderivative turbines at Mayagüez are part of PREPA's Central Hidro Gas organization.

Genera PR on behalf of Puerto Rico Power Authority respectfully requests COR3 and FEMA a project for the Inspection and Reparation of 4 Generator Mayaguez Generation Plant

IV. Codes and Standards

The following will be referenced when applying specific codes, specifications, and standards to the project design:

- Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR, February 2020.
- Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
- FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
- Rus 1730B - The referenced standards, as defined and as per their requirements, state every system is required to have an Emergency Restoration Plan (ERP) in the event of a major failure or storm event.
- LUMA Operation Reserve Standard - LUMA, as the T&D System Operator, is responsible for ensuring that the system has enough generation resources to function properly. This is also known as resource adequacy. To fulfill this responsibility, LUMA has set a standard for Operational Reserve Capacity. The formula used to determine this capacity is detailed below, with Genera's input in the second column. LUMA may choose to modify the formula or inputs used, such as averages, without input from Genera.

V. Initial Scope of Work

HOT INSPECTION 4A

The work includes providing labor, supervision, materials, equipment, inspection and all necessary required to perform a hot section inspection. The scope of work includes but not limited to examining the condition of a number of key engine parts, including turbine blades, the combustion chamber, the stators, the vane rings, the

compressor turbine disk and the segments. Including the repair or replacement of necessary parts and the performance necessary services.

- Transportation to and from the Mitsubishi Power Aero Repair Depot located at 1460 Blue Hills Ave, Bloomfield, CT 06002.
- Service – Induction and disassembly of GG 743103 (**GG means Gas Generator**)
    - a) Once the GG has been inducted and disassembled, Buyer will be advised of the status

of the disassembly process and can review the intended scope of work for repair.

    - b) Upon completion of disassembly and inspection process, a Gate 2 Estimate will be

provided to Buyer with the estimated price to complete the repair.

    - c) If Buyer wishes for ARG Precision to proceed with the proposed work scope, a purchase

order supplement will be required at that time.

    - d) If PO supplement is not received within 10 days, ARG Precision reserves the right to

move the unit off the production line and as needed into storage. Storage fees will apply.

    - e) If a PO matching the Gate 2 Estimate is received, manufacturer will commence the work

and provide an estimated schedule for completion.

    - f) If fallout exceeds what was estimated in the Gate 2 Estimate, Buyer will receive a Gate

3 Estimate with updated pricing. If this occurs, an additional supplemental PO will be

required.

    - g) At the completion of the work, a final Gate 4 Estimate will be generated reflecting all

of the actual parts, repairs and labor performed. If required, a purchase order matching

the final Gate 4 Estimate will be necessary prior to Mitsubishi Power delivering the unit
in accordance with the Terms and Conditions.

- h) If Purchaser fails to nominate a carrier or furnish written shipping plans at least ten (10)

days prior to the expected delivery date for the goods, Seller may, at any time thereafter,
do either of the following for the account and at the expense and risk of Purchaser:
arrange for shipment of the goods by a carrier of its own selection to Purchaser's place of
business or other destination reasonably believed to be suitable, or warehouse the goods

Repair & Replacement Combustor Components Unit 2B

This project involves the replacement of gas turbine Unit 2B 743067 components as described in Table 1 below at the Mayagüez Power Plant. The work includes the purchase, delivery, removal of existing components, and installation of new ones, following the Manufacturer's recommended procedures and Genera PR's instructions. The Contractors will adhere to Genera PR safety Provisions and regulations.

Objectives:

- Ensure the seamless replacement of Unit 2B 743067 components.
- Minimize downtime and ensure the plant's operational efficiency.
- Comply with all safety and environmental regulations.

Work to be Completed:

1. Remove existing components from Unit 2B 743067 (See components description and quantities in Table 1 below)

a. Transport removed components to the designated storage area within the plant
b. Dispose of existing components in accordance with local and federal environmental regulations

2. Install and connect new components following the Manufacturer's recommended procedures and practices. (See components description and quantities in Table 1 below)
3. Perform start-up and set up to ensure successful service of Unit 2B 743067

Table 1: Components Description

PART No.	DECSRIPTION	QTY.
VQ668803	TUBE-CC INTERCONNECTOR	9
VQ1083620	WASHER-KEY, DOUBLE, .1975X.625X.031	9
VQAS3303-06	(U) BOLT PART SUBS LIST IT	6
VQST5074-09	(C) NUT OPTION (IC)	6
VQ1081992	(U) PIN-COMBUSTION CHAMBER	9
VQ1083619	(U) WASHER-KEY, DOUBLE, .3225X.660X.031	9
VQST1883-11	(U) BOLT-MACHINE, .3125X24X.938, HEX	6
VQ1081905-01	(U) GUIDE-COMBUSTION CHAMBER, ASSY	9
VQMS9081-08	(C) BOLT-MA, DH EWSH DR,.250-28X.625	6
VQAS3214-02	WIRE SAFETY, .031	1
VQST1508-14	BOLT-MACHINE, .250-28X1.000, HEX	38
VQ1086183	SPACER-SLEEVE, .254X.355X.530, FLANGED	38
VQ1082270	SPRING-COMPRESSION, .550X.015X6 COIL	38
VQ1082272	WASHER-FLAT, .386X.625X.143	38
VQ1083903-01CL1	SEAL ASSY OF-C	2
VQ1082275	SPACER-PLATE, CC DUCT SUPPORT	5
VQ1082276	SPACER-PLATE, CC DUCT SUPPORT	1
VQM9557-19	BOLT-MA, DH EXT WASHER HEAD	2
VQ776441	NUT OPTION (IC)	2
VQ1083902-01CL1	SEAL ASSY OF-C	2
VQ4023466	NUT OPTION (IC)	38
VQST1087-030	BOLT MACHINE, .250-28, SLAB	2
VQ4023466	NUT OPTION (IC)	2

VQ1084826	SPACER-SLEEVE, .2535X.355X.312, FLGD	38
VQ1082270	SPRING-COMPRESSION, .550X.015X6 COIL	38
VQ51K208CL5	SPACER-PLATE, C	2
VQ51K208CL6	SPACER-PLATE, C	2
VQ51K208CL7	SPACER-PLATE, C	2
VQ51K208CL8	SPACER-PLATE, C	2
VQ51K208CL9	SPACER-PLATE, C	2
VQ51K208CL10	SPACER-PLATE, C	2
VQMS9697-13	BOLT, MACH-DBL HEX, EXT WASH, CORR/HT RES	38
VQ1082272	WASHER-FLAT, .386X.625X.043	38
VQ1086180	SPACER-PLATE, COMB CHAMBER DUCT SUPPORT	5
VQ1088181	SPACER-PLATE, COMB CHAMBER DUCT SUPPORT	1
VQ1082274	WASHER-KEY, DOUBLE, .281IDX2.462	19
VQ1088171	VANE ASSY OF HIGH PRESSURE TURB, 1STAG	10
VQ1080993-01	SEAL-HPT VANE, 1STG, ASSY OF	34
VQ1063602-01	SEAL AASYOF-HPT VANE, 1STAGE	34
VQ648762	BOLT-MACHINE, .250-28X1.000, DH	4
VQ702703	BOLT-MACHINE, .190-32X1.000, DOUBLE HEX	1
VQ1088150	BOLT-MECHINE, .250-32X.625, HEX	38
VQ1088153	WASHER-KEY, DOUBLE, .281IDX1.688	19
VQST1142-069	(U) GASKET OPTION (IC)	2
VQST1141-41	(U) GASKET OPTION (IC)	4
VQST1141-25	(U) GASKET OPTION (IC)	4
VQMS9586-10	(C) BOLT-MACHINE DBL HEX EXT WASHER HEAD	6
VQST1748-18	(U) BOLT-MACHINE, .375-24X1.500, DRILLEDDBL	5
VQST1258-12	(C) NUT OPTION (IC)	5
VQ786376	(C) NUT OPTION (IC)	5
VQ182888	GASKET-.945X1.185X.0505	4
VQCT117088-1	WASHER, (PARTS GG8 INIT. LEADS)	2

Repair & Replacement Combustor Components Unit 3A

Initial SCOPE OF WORK

The work includes providing labor, supervision, materials, equipment, inspection and all necessary required to perform a hot section inspection. The scope of work includes but not limited to examining the condition of a number of key engine parts, including turbine blades, the combustion chamber, the stators, the vane rings, the compressor turbine disk and the segments. Including the repair or replacement of necessary parts and the performance necessary services.

VI. Cost Estimate

Item	Description	Cost
1	Hot Inspection 4A	$9,000,000.00
2	In-Field Replacement of UNIT 2B 743067 and NGV Replacement	$550,000.00
3	Combustor Repair and Replacement Unit 3A	$675,000.00
	Total	$10,225,000.00

VII. Environmental & Historic Preservation ("EHP") Requirements

A. Other than design, planning and non-destructive due diligence studies, no construction work will commence prior to the issuance of specific expressed written FEMA approval for the specific scope of work. FEMA requested EHP compliance review will precede the execution of each proposed scope of work submitted by PREPA through its agent Genera PR to FEMA. PREPA through its agent Genera PR is aware of its responsibility for coordinating, notifying, obtaining permits, and complying with applicable federal, state, and local laws, regulations, and executive

orders and understands that failure to comply with EHP requirements will jeopardize FEMA funding.

B. See the following for general methods of repair and list of equipment to be used:

   a. Dismantle & Salvage
      - Complete testing for any containments or hazardous waste.
      - All contaminated materials will be delivered at the approved waste disposal as per the Disposal Management Plan.
      - If the equipment is to be salvaged, it will be loaded and removed from the site.
      - All debris will be taken to the approved waste disposal facility as per the Waste Management Plan.

C. List of Equipment to be used but it is not limited to the following:
   - Crawler Crane
   - Semi-truck with low-bed trailer
   - Man lift

D. Removal of vegetation
   - N/A

E. List the type of debris:
   - Metal scrap, domestic waste, wood.
   - The debris will be separated and taken to an approved waste disposal facility. Location permits and support documentation will be provided close-out.

F. Description of Staging Area:
    - Staging area will be provided. A Plan CES will be implemented.

G. Hazardous Material:
    a. Describe the activity and the hazardous material involved. Calculate the quantity to be generated or disposed and include the management and disposal plan.
        - The identified hazardous materials that can be found in the Generation Plant are asbestos, PCBs, Lead, SF6 gas, oil from the transformer & breakers. These hazardous materials will be handled and disposed of as per Federal and State Laws.
        - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations
        - These products and their residues will be stored in special covered areas for disposal by an authorized company and provided with temporary spill controls until collected. All paint containers and curing compounds will be tightly sealed and stored when in use. Excess paint will not be discharged to the storm system, but properly disposed of, according to the manufacturer's instructions.
        - Material amounts will be provided by a certified management contractor performing a site evaluation calculation for asbestos and lead paint.
        - Prior to the start of any equipment dismantling activities, inspections for the presence of asbestos will be conducted by a trained and certified contractor.

- All asbestos waste found at the Generation Plant will be disposed of at an approved landfill designated by the Department of Environmental Health & Safety. All asbestos waste generated will be bagged and transported in accordance with all applicable State and Federal regulations. There will be no exceptions.
- Any asbestos spills will be cleaned up immediately to prevent the dispersal of fibers. Prudence will be exercised to avoid contamination of laboratory facilities or exposure of personnel to asbestos. Asbestos spills will be cleaned up with wet methods and/or a High-Efficiency Particulate-Air (HEPA) filtered vacuum.

b. If the project includes building demolition with asbestos, provide a copy of the EQB approved plan or evidence of plan submission.
    - Not Applicable.

c. If the project includes disposal of damaged transformers or wood poles with creosote, include the management and disposal plan. The plan must include the final disposition site.
    - Transformers and pole disposal will be handled as per the Waste Disposal Management Plan. GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
    - The removal of the transformer will require testing of the existing oil for PCB's levels, drain oil, and delivery to the approved waste disposal site as per Environmental Regulations.
    - Removal of wood poles with creosote treatment will be handled according to the Federal and State Laws.

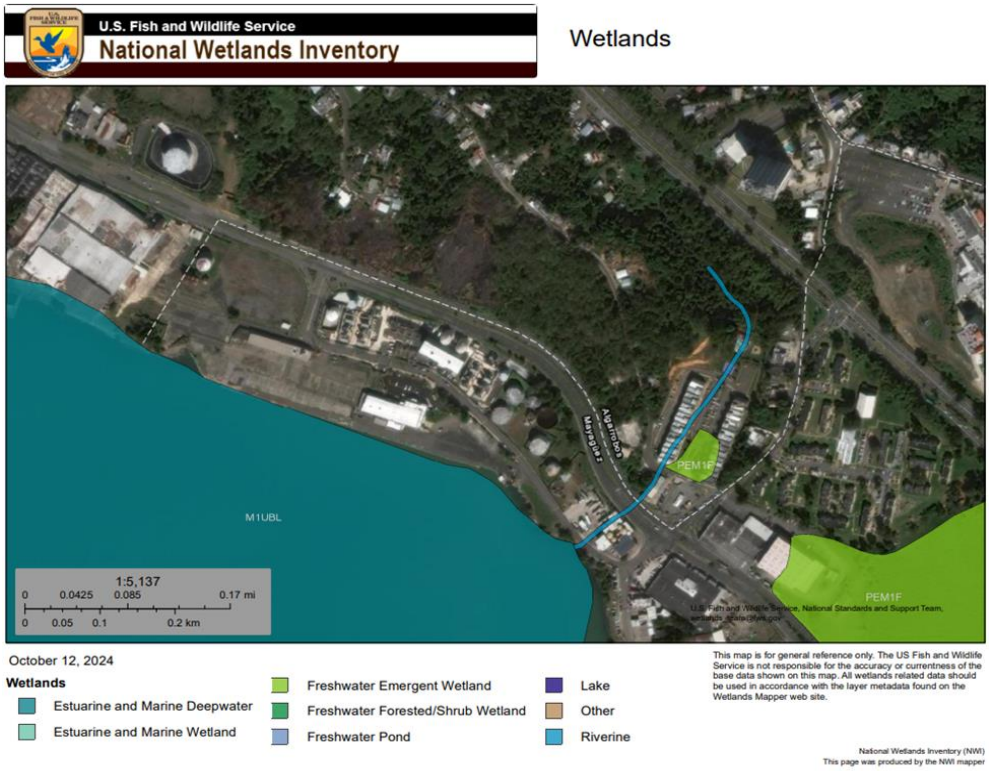
H. Water Crossings:

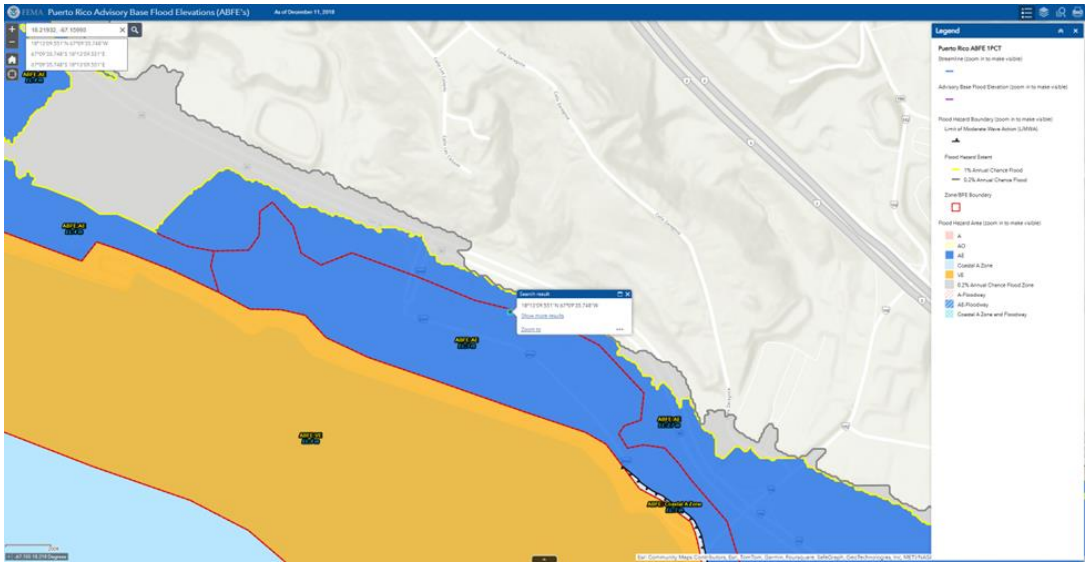
a. Specify if the project will affect a waterway or body of water.
    - Generation plant is delimited by an existing dike.

b. Modification of a body of water or wetland: Does the project require dredging, excavation, disposal of material, adding fill material that might result in any modification of a body of water or wetland designated as "waters of the U.S."?
    - Not Applicable

c. Does the project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?
    - Not Applicable

d. Flood zone: Is the project located in a flood zone, floodway or will it have a negative impact on the flood zone?
    - The Generation Plant is in Flood Zone A (SFHA per ABFE). The proposed inspection and repairs will not have a negative impact.
    - In accordance with the updated version of FEMA Region II Memorandum, dated October 10, 2017, Guidance for the use of Available Flood Hazard Information for the Government of Puerto Rico in complying with FEMA Policy 104-008-2, 44 CFR Part 9, and Executive Order 11988 (Floodplain Management). All hazard mitigation proposals under alternative procedures must be designed using the best available flood hazard data and in compliance with applicable regulations and policy.





I. Structure Age:

a. Provide the construction date of any buildings or structures within the project. Include those near the project.
    - Not Applicable.
b. Provide date and information of any prior repairs, remodeling and/or rehabilitation of the property. Include current and previous use of building or structure.
    - Not Applicable.
c. If a building includes both older and newer sections, confirm which section of the building the work is being done.
    - Not Applicable
d. Include plans, drawings, blueprints, any architectural documentation available for new construction or substantial improvements regardless of the age of the building or structure.
    - Not Applicable
e. Provide at least five color pictures of every structure or building, showing the four facades and the contextual view. Include additional pictures of architectural details. Also provide pictures of buildings (45 years old or older) on the proximity.
    - Not Applicable.
f. Provide an aerial photo map with the GPS coordinates of each structure.
    - Not Applicable.

J. Ground Disturbance
    a. Provide a description of the new ground disturbance by giving the dimensions (area, depth, volume, etc.), if any. Include an aerial photo map showing the extent of the disturbance with coordinates.
        - Refer to Scope of Work

b. The project SOW will not affect water or sewer utility services.
c. Indicate the prior/current use of the area to be impacted.
    - The area is an existing Generation Plant. 100% of the work to be completed will be within the existing and already impacted Generation Plant perimeter.
d. Explain how materials will be stockpiled and disposed of.
    - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
e. Specify final disposition site.
    - The disposal of materials will be handled as per the Waste Management Plan.

K. Soil Stabilization measures:
a. Does the project involve any soil stabilization measures?
    - Not Applicable

L. Required Permits

List of the permits needed for Mayaguez Generation Site:

- Environmental Compliance Determination in Oficina de Gerencia de Permisos (OGPe)
- General Consolidate Permit – OGPe
- Genera will provide proof of all permits as a Condition of FEMA Record of Environmental Considerations

I. Overview

Project Name: 1. HP/IP/LP Spare Turbine Rotor Repair Aguirre Steam Plant Units 1 & 2

2. Generator Spare Rotor Rewind

Project Type: 428 Initial SOW

Project Location : Central Aguirre, Puerto Rico 00704

Latitude/Longitude : 17.95111, -66.23554

Version : 0

II. Introduction

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On September 6, 2017, Puerto Rico's northern coastline was struck by Hurricane Irma, a Category 4 storm. Two weeks later, on September 17, Hurricane Maria tore through the island of Puerto Rico as a Category 5 storm. Subjected to 150+

mph winds and more than 25 inches of rain, 3.4 million residents lost power and a great deal of infrastructure, including critical facilities, was damaged. In particular, the electrical infrastructure suffered catastrophic impacts. In the aftermath, diligent recovery and reconstruction have been going on, not only to restore the electrical infrastructure to pre-storm function and capacity, but to take this opportunity to bring it in line with current standards and technology. With the recovery funding available, "*Everyone can be sure that we are working responsibly to achieve efficiencies, reduce costs, decommission inefficient and polluting plants, and continue to transform our electrical system for the benefit of our economy and our people*" as Governor Pedro Pierluisi said, this being an opportunity to not just to rebuild the system but to transform it into a smarter, more resilient, and cleaner one. Puerto Rico's generation system must meet customer demand and have adequate additional capacity to comply with the reserve required by the standard operating procedures of the T&D system operator (LUMA). In terms of service continuity, the system must be reliable so that service interruptions are within the margins established in the electrical industry standards.

In 2020 the situation became more complicated when earthquakes events 4473DR-PR provoked more damages to Costa Sur Power Plant. Later, in September 2022, Hurricane Fiona 4671DR-PR also impacted Puerto Rico, destroying even more the already fragile generation assets. Unfortunately, the generation system presents critical performance metrics with a deficiency in capacity to meet the energy demand and the minimum reserve requirements. The forced outage percentage of the units is increasing while the generation capacity decreases. This combination of factors puts the continuity of the service at high risk, adversely affecting the quality of life of those who live in PR.

Genera is responsible for operating and maintaining PREPA's legacy asset generation fleet pursuant to the Generation O&M Agreement. The current fleet condition presents poor performance due to the impact of hurricanes María and Fiona. Generation capacity has been reduced to 46% of installed capacity. In addition, of the generation units in operation, about 32% or 640 MW, are

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To enhance the system's reliability, Genera proposes to submit for approval the Detailed Scope of Work (SOW) to COR3 and FEMA for the project 669498 under DR-4339-PR Public Assistance. The document provides a description of the project including scope, schedule, and cost estimates as well as Environmental & Historical Preservation ("EHP") requirements.

III. Facility Description

PREPA's Generation System Program was developed and is being executed using the industry standards, following the equipment's manufacturer recommendations and PREPA policies. Periodical inspections, tests are performed to identify critical component repairs/replacement in equipment such as boilers, turbines, generators, power transformers, circuit breakers, protection and control relays, grounding mats, and auxiliary equipment.

Genera PR proposes to perform necessary repair and/or replacement of critical generation components pursuant to the Generation O&M Agreement between PREPA, the P3 Authority, and Genera PR.

Aguirre is located on the south coast of Puerto Rico in the Salinas municipality and is owned and operated by PREPA. The Plant has two 450-MW thermal steam power generation units, two 296-MW combined cycle (CC) power generation units that can also operate in simple-cycle mode, and two 21-MW black-start capable gas turbines (GTs). The nameplate capacity of the Plant is 1534 MW (gross), including the units that are currently out of service for repairs

The two 450-MW thermal units, referred to as Units 1 and 2, were commissioned in 1971 and 1972, respectively. A 1991 upgrade to 500 MW on their General Electric (GE) (formerly ABB) steam turbines (STs) is based on 3430-kilopound/hour main steam flow at 2400 psig and 1000°F and hot reheat conditions of 594 psig and 1000°F. Boiler restrictions on steam flow have limited the units to their original 450 MW. The boilers burn heavy fuel oil (HFO) and are tangentially fired models by Combustion Engineering, now GE Power.

Figure 1: Facility Location

IV. Codes and Standards

The following will be referenced when applying specific codes, specifications, and standards to the project design:

- Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR, February 2020.
- Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
- FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
- Rus 1730B - The referenced standards, as defined and as per their requirements, state every system is required to have an Emergency Restoration Plan (ERP) in the event of a major failure or storm event.

V. Project Description – HP/IP/LP Spare Turbine Rotor Repair Aguirre Steam Plant Units 1 & 2

This project consists in the repair of the existing steam turbine spare rotor for units 1 & 2, located at Aguirre Power Complex.

Initial Scope of Work

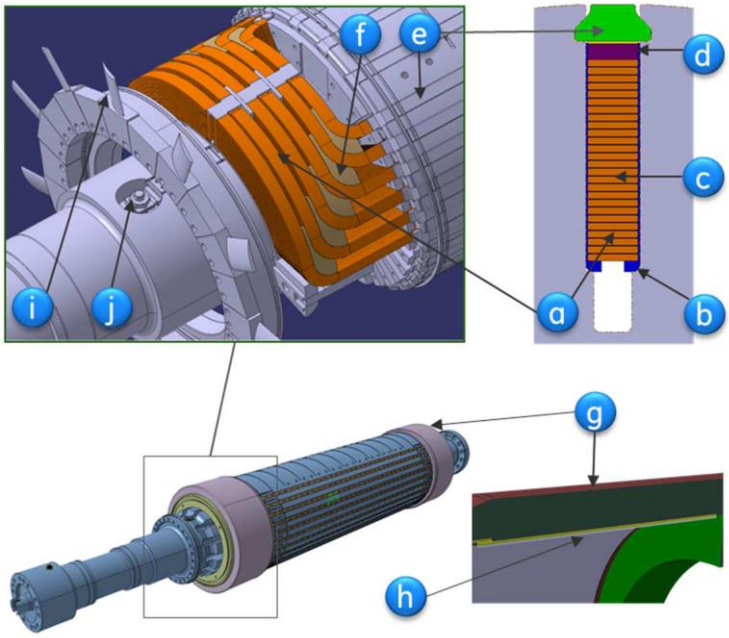
Contractor shall furnish and provide all work, labor, materials, tools, equipment, enclosures, transportation, inspection, tests, supervision, all necessary services, job administration and superintendence, required for the turn-key project of disassembly, inspection, testing, repair and refurbishment of the entire steam turbine rotor, to be ready for installation as needed to sustain power generation to Puerto Rico's electrical grid.

Generator Spare Rotor Rewind

Initial Scope of work

The following represents a typical scope of supply and work scope for rotor re-wind.

- Slot wall insulation
- Coils (options)
- Top of slot creep strip
- Retaining Ring Insulation
- Flexible lead
- Pole to pole connection
- Balance weights



a) Rotor Winding
b) Retaining ring
c) Retaining ring insulation
d) Fan
e) Radial stalk/flexible lead
f) End winding insulation blocking
   - Slot wall insulation
g) Interturn insulation
h) Top of slot creep strip (Top Packer)
i) Slot Closing wedge

The following components will be thoroughly cleaned and inspected prior to be re-used during the rotor rewind:

- Rotor shaft
- Retaining rings (18/18)
- Slot closing wedges
- Fans
- Central connection
- Radial stalks
- Copper Coils (option)

Those components are expected to be suitable for operation and condition of the existing brazed joints in the rotor winding as-well. After disassembly and before re-wind operation start, a detailed inspection will be performed. Any repair required to the above components will be considered as extra-work. Although provision is made within the rewind kit of parts to effect minor repairs, more serious issues identified at this stage may increase program duration and incur additional costs.

If necessary ,the rewind will be done with new coils.

Project shall include transportation from Aguirre Steam Plant by ground and air to the Contractor's Workshop in the United States and return.

VI. Cost Estimate

Item	Description	Cost
	HP/IP/LP Spare Turbine Rotor Repair Aguirre Steam Plant Units 1 & 2	$5,016,000.00
	Generator Spare Rotor Rewind	$3,275,000.00

VII. Environmental & Historic Preservation ("EHP") Requirements

A. Other than design, planning and non-destructive due diligence studies, no construction work will commence prior to the issuance of specific expressed written FEMA approval for the specific scope of work. FEMA required EHP compliance review will precede the execution of each proposed scope of work submitted by PREPA through its agent Genera PR to FEMA. PREPA through its agent Genera PR is aware of its responsibility for coordinating, notifying, obtaining permits, and complying with applicable federal, state, and local laws, regulations, and executive orders and understands that failure to comply with EHP requirements will jeopardize FEMA funding.

B. See the following for general methods of repair and list of equipment to be used:

a. Dismantle & Salvage
- Complete testing for any containments or hazardous waste.
- All contaminated materials will be delivered to the approved waste disposal as per Disposal Management Plan.
- If equipment is to be salvaged, it will be loaded and removed from the site.
- All debris will be taken to the approved waste disposal facility as per the Waste Management Plan.

C. List of Equipment to be used but it is not limited to the following:
- Crawler Crane
- Semi-truck with low-bed trailer
- Man lift

D. Removal of vegetation
- N/A.

E. List the type of debris:
- Metal scrap, domestic waste, wood.

- The debris will be separated and taken to an approved waste disposal facility. Location permits and supporting documentation will be provided at closeout.

F. Description of Staging Area:
    - N/A – only minor equipment staging near the existing equipment to be dismantled and installed.

G. Hazardous Material:

a. Describe the activity and the hazardous material involved. Calculate the quantity to be generated or disposed and include the management and disposal plan.

- The identified hazardous materials that can be found in the Generation Plant are asbestos, PCBs, Lead, SF6 gas, oil from the transformer & breakers. These hazardous materials, will be handled, and disposed of as per Federal and State Laws.
- GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations
- These products and their residues will be stored in special covered areas for disposal by an authorized company and provided with temporary spill controls until collected. All paint containers and curing compounds will be tightly sealed and stored when in use. Excess paint will not be discharged to the storm system, but properly disposed of, according to the manufacturer's instructions.
- Material amounts will be provided by a certified management contractor performing a site evaluation calculation for asbestos and lead paint.
- Prior to the start of any equipment dismantling activities, inspections for the presence of asbestos will be conducted by a trained and certified contractor.

- All asbestos waste found at the Generation Plant will be disposed of at an approved landfill designated by the Department of Environmental Health & Safety. All asbestos waste generated will be bagged and transported in accordance with all applicable State and Federal regulations. There will be no exceptions.
- Any asbestos spills will be cleaned up immediately to prevent the dispersal of fibers. Prudence will be exercised to avoid contamination of laboratory facilities or exposure of personnel to asbestos. Asbestos spills will be cleaned up with wet methods and/or a High-Efficiency Particulate-Air (HEPA) filtered vacuum.

b. If the project includes building demolition with asbestos, provide a copy of the EQB approved plan or evidence of plan submission.

- Not Applicable.

c. If the project includes disposal of damaged transformers or wood poles with creosote, include the management and disposal plan. The plan must include the final disposition site.

- Transformers and pole disposal will be handled as per the Waste Disposal Management Plan. GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
- The removal of the transformer will require testing of the existing oil for PCB's levels, drain oil, and delivery to the approved waste disposal site as per Environmental Regulations.
- Removal of wood poles with creosote treatment will be handled according to the Federal and State Laws.

H. Water Crossings:

a. Specify if the project will affect a waterway or body of water.

- Not Applicable

b. Modification of a body of water or wetland: Does the project require dredging, excavation, disposal of material, adding fill material that might result in any modification of a body of water or wetland designated as "waters of the U.S."?

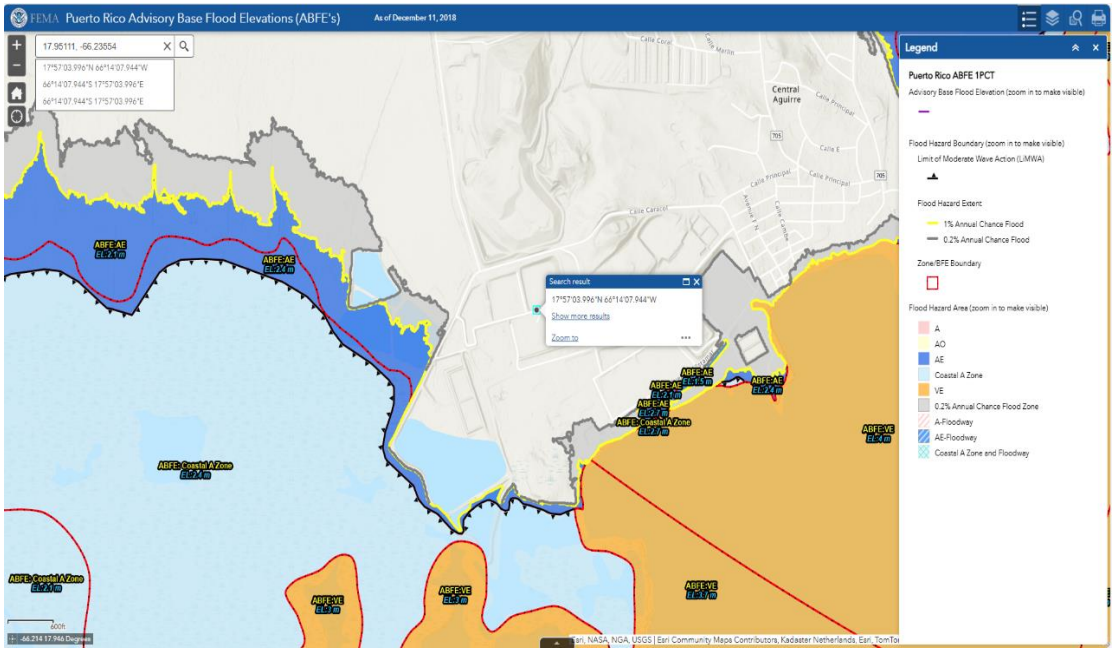
- Not Applicable

c. Does the project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?

- Not Applicable

d. Flood zone: Is the project located in a flood zone, floodway or will it have a negative impact on the flood zone?

- The Generation Plant is in Flood Zone A (SFHA per ABFE). Equipment replacement only. No negative impact.
- In accordance with the updated version of FEMA Region II Memorandum, dated October 10, 2017, Guidance for the use of Available Flood Hazard Information for the Government of Puerto Rico in complying with FEMA Policy 104-008-2, 44 CFR Part 9, and Executive Order 11988 (Floodplain Management). All hazard mitigation proposals under alternative procedures must be designed using the best available flood hazard data and in compliance with applicable regulations and policy.



I. Structure Age:
   a. Provide the construction date of any buildings or structures within the project. Include those near the project.
      - Not Applicable.

b. Provide date and information of any prior repairs, remodeling and/or re-habilitation of the property. Include current and previous use of building or structure.
   - Not Applicable.

c. If a building includes both older and newer sections, confirm which section of the building the work is being done.
   - Not Applicable

d. Include plans, drawings, blueprints, any architectural documentation available for new construction or substantial improvements regardless of the age of the building or structure.
   - Not Applicable

e. Provide at least five color pictures of every structure or building, showing the four facades and the contextual view. Include additional pictures of architectural details. Also provide pictures of buildings (45 years old or older) on the proximities.

- Not Applicable.

J. Ground Disturbance
   a. Provide a description of the new ground disturbance by giving the dimensions (area, depth, volume, etc.), if any. Include an aerial photo map showing the extent of the disturbance with coordinates.
      - Not Applicable.

   b. The project SOW will not affect water or sewer utility services.
   c. Indicate the prior/current use of the area to be impacted.
      - Not Applicable. Area is an existing Generation Plant. 100% of the work to be completed will be within the existing and already impacted Generation Plant perimeter.

   d. Explain how materials will be stockpiled and disposed of.
      - Not Applicable.
      - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
   e. Specify final disposition site.
      - The disposal of materials will be handled as per the Waste Management Plan.

K. Soil Stabilization measures:
   a. Does the project involve any soil stabilization measures?
      - No

L. Required Permits

List of the permits needed for Costa Sur Site:

- Environmental Compliance Determination in Oficina de Gerencia de Permisos
- General Consolidate Permit – OGPe
- Genera Will provided proof of all permits as a Condition of FEMA Record of Environmental Considerations (REC).

Version 0

In Re: 4339 DR-PR Initial Scope of Work
Project # 669498

I. Overview

Project Name: 1. ASP Nautilus Rehabilitation Project

2. Manufacture and Delivery BFWP 5,000 HP Motor

3. Improvements to the Pier and Replacement of Sections of Fuel Oil Pipelines

Project Type: 428 Detailed SOW

Project Location : Central Aguirre, Puerto Rico 00704

Latitude/Longitude : 17.95111, -66.23554

Version : 2

II. Introduction

PREPA is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns the power plants for electric generation, transmission, and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 3.4 million people. Genera-PR is the operator authorized under a Public-Private Partnership agreement of the thermal generation facilities of Puerto Rico. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair and improvement. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements.

On September 6, 2017, Puerto Rico's northern coastline was struck by Hurricane Irma, a Category 4 storm. Two weeks later, on September 17, Hurricane Maria tore through the island of Puerto Rico as a Category 5 storm. Subjected to 150+ mph winds and

more than 25 inches of rain, 3.4 million residents lost power and a great deal of infrastructure, including critical facilities, was damaged. In particular, the electrical infrastructure suffered catastrophic impacts. In the aftermath, diligent recovery and reconstruction have been going on, not only to restore the electrical infrastructure to pre-storm function and capacity, but to take this opportunity to bring it in line with current standards and technology. With the recovery funding available, "*Everyone can be sure that we are working responsibly to achieve efficiencies, reduce costs, decommission inefficient and polluting plants, and continue to transform our electrical system for the benefit of our economy and our people*" as Governor Pedro Pierluisi said, this being an opportunity to not just to rebuild the system but to transform it into a smarter, more resilient, and cleaner one. Puerto Rico's generation system must meet customer demand and have adequate additional capacity to comply with the reserve required by the standard operating procedures of the T&D system operator (LUMA). In terms of service continuity, the system must be reliable so that service interruptions are within the margins established in the electrical industry standards.

In 2020 the situation became more complicated when earthquakes events 4473DR-PR provoked more damages to Costa Sur Power Plant. Later, in September 2022, Hurricane Fiona 4671DR-PR also impacted Puerto Rico, destroying even more the already fragile generation assets. Unfortunately, the generation system presents critical performance metrics with a deficiency in capacity to meet the energy demand and the minimum reserve requirements. The forced outage percentage of the units is increasing while the generation capacity decreases. This combination of factors puts the continuity of the service at high risk, adversely affecting the quality of life of those who live in PR.

Genera is responsible for operating and maintaining PREPA's legacy asset generation fleet pursuant to the Generation O&M Agreement. The current fleet condition presents poor performance due to the impact of hurricanes María and Fiona. Generation capacity has been reduced to 46% of installed capacity. In addition, of the generation units in operation, about 32% or 640 MW, are disconnected monthly, causing thousands of customers to suffer interruptions in their service.

The Puerto Rico Electric Power Authority ("PREPA") is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns and operates electric generation, transmission and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 1.5 million customers. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair and improvements. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements. On January 2023, PREPA and the Puerto Rico Public-Private Partnership Authority ("P3 Authority") selected Genera PR, LLC ("Genera") to operate, maintain and modernize the Generation system of PREPA for ten years through a public-private partnership.

To enhance the system's reliability, Genera proposes to submit for approval the Detailed Scope of Work (SOW) to COR3 and FEMA for the project 669498 under DR-4339-PR Public Assistance. The document provides a description of the project including scope, schedule, and cost estimates as well as Environmental & Historical Preservation ("EHP") requirements.

III. Facility Description

PREPA's Generation System Maintenance Program was developed and is being executed using the industry standards, following the equipment's manufacturer maintenance recommendations and PREPA policies. Periodical inspections, tests are performed to identify critical component repairs/replacement in equipment such as boilers, turbines, generators, power transformers, circuit breakers, protection and control relays, grounding mats, and auxiliary equipment.

Genera PR proposes to perform necessary repair and/or replacement of critical generation components pursuant to the Generation O&M Agreement between PREPA, the P3 Authority, and Genera PR.

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Figure 1: Facility Location

IV. Codes and Standards

The following will be referenced when applying specific codes, specifications, and standards to the project design:

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V. Project Description - ASP Nautilus Rehabilitation Project

This project aims to ensure the structural integrity and operational efficiency of the Nautilus Tanks through comprehensive rehabilitation and protective measures. Tanks are located in 17.949504, -66.227227. 3 tanks are going to be rehabilitated with approximate dimensions of 48 FT diameter, 19.89 FT high and 3,000 SF of interior wall surface.

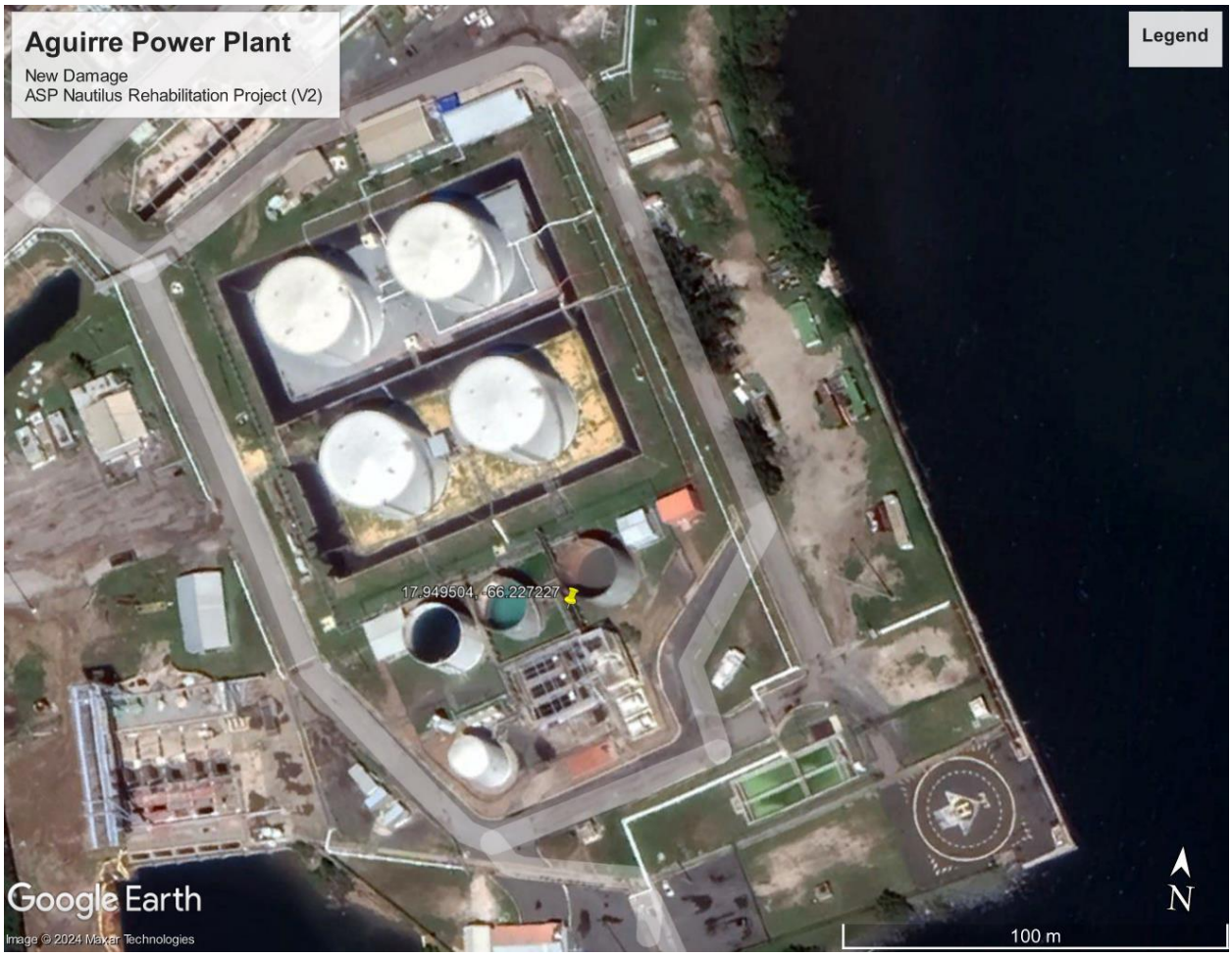


Figure 2: Nautilus Tanks Location

Initial Scope of Work

The work includes providing labor, supervision, materials, equipment, inspection and everything necessary for the installation and acceptance by Genera PR of a Coating-Ceramic Reinforced Lining system throughout the interior and anti-corrosion protection in the external part of the Nautilus Tanks that is located in the facilities of the Aguirre Power Plant, Salinas PR. Part of the work will be mechanical repair with welded steel plates to repair walls, channels and floor of tanks where the loss of thickness exceeds 50% of the original thickness. The scope of work will

also include removing and reinstalling all the existing mechanical equipment that is part of the operation of the tank, i.e., mixers, motor-transmission, sprocket and chain for the flocculation wheels, transmission of the syphon car with chain mechanism and honeycombs.

It will be the responsibility of the contractor to mechanically dismantle the tank systems in order to have adequate access to the interior of the tank and to be able to carry out the repair work by welding and interior coating. You shall store and identify the parts, equipment, and mechanical attachments of the tank operating mechanism in a safe and protected area to prevent damage. After the completion of the rehabilitation work, he will be in charge of assembling all the parts and equipment and will leave the tank mechanism operable. Any hardware required for the reinstallation of the equipment again will be the responsibility of the contractor, it is allowed to reuse the existing hardware that is in good condition and not corroded. The contractor should consider that during the re-installation of the equipment, any incidental damage to the interior cladding must be repaired at its own cost and following the manufacturer's recommendations for repair.

A. Installation of Coating-Ceramic Reinforced Lining System
    1. Apply Coating-Ceramic Reinforced Lining system throughout the interior of the Nautilus Tanks.
        a. Interior Surface Area: 3,000 sq. ft.
        b. Additional Coating Area: 250 sq. ft.
        c. Top Area Coating: 500 sq. ft.
        d. Remove new and existing weld spatter debris prior to preparation and coating application.
    2. Apply anti-corrosion protection to the external parts of the tanks.
        a. This includes the additional 250 sq. ft. area specified for anti-corrosion coating.
B. Mechanical Repairs
    1. Repair of Tank Walls, Channels, and Floor
        a. Welded Steel Plates: Repair areas where the loss of thickness exceeds 50% of the original thickness.

2. Removal and Reinstallation of Mechanical Equipment
    a. Mixers: Dismantle, store, and reinstall.
    b. Motor-Transmission: Dismantle, store, and reinstall.
    c. Sprocket and Chain for Flocculation Wheels: Dismantle, store, and reinstall.
    d. Transmission of the Syphon Car: Dismantle, store, and reinstall.
    e. Honeycombs: Remove, pressure wash (1,800 psi), store, and reinstall.

C. Dismantling and Reassembly
    1. Mechanically dismantle the tank systems to provide adequate access for interior repairs.
    2. Store and identify all parts, equipment, and mechanical attachments safely to prevent damage.
    3. Reassemble all parts and equipment post-rehabilitation, ensuring the tank mechanism is operable.

D. Hardware and Incidental Repairs
    1. Supply any necessary hardware for reinstallation, reusing existing hardware that is in good condition and not corroded.
    2. Repair any incidental damage to the interior cladding during reinstallation at the contractor's cost, following the manufacturer's repair recommendations.

E. Structural Repairs
    1. Catwalk Railings
        a. Reinforcement: Check for damage and modify to meet OSHA codes. Strengthen the railings in areas identified as unsafe. This may involve adding additional support structures or reinforcing existing ones.
    2. Control Panel Structure
        a. Frame Dimensions: The new frame for the control panels will be constructed using 4-inch channels, matching the original dimensions.
        b. Roof Plates: The coated with anti-corrosion roof plates will be installed as part of the structure matching the existing structure to ensure proper fit and coverage.

Special Considerations to be Addressed Under this Scope of Work

A. Lead Inspection Test shall be performed prior any activities takes place.
    1. If necessary, Lead abatement of existing surfaces will be performed.
B. All repairs of weld patches on the tank wall and floor must be tested with a Penile Dye Non-Destructive Test (NDT Penetrant Tints-PT).
C. All welds shall be made in such a manner as to ensure complete fusion with the base metal, within the limits specified for each joint and strictly following the Qualified Procedure.
D. Welders must be qualified for the type of work to be performed.
E. Only procedures qualified by the company will be accepted to carry out the welding work.
F. Removal and installation of existing transmission and installation of flocculation wheels, including chain supply in non-metallic chain UHMW material. The contractor shall render the equipment operable.
G. Included is the removal, 1,800psi pressure washing, and installation of the clarifier honeycombs once the interior tank rehabilitation work is completed. The contractor will be responsible for installing them and all the materials necessary for their installation will be reused from the existing ones. Red cedar woods will also be reused, and it will be the contractor's responsibility for cleaning and safe storage during the course of the project.
H. The catwalk railings around the tanks will be reinforced, as they are unsafe on some sides and require repair. The contractor will check the guardrails for damage and modify them to meet OSHA codes.
I. The replacement of the protective structure of the control panel is contemplated, the contractor will install the new frame of the structure of the control panels of each tank, includes the installation of roof plates, the frame will be in a 4" channel as the original and of the same dimensions. It shall be coated with the anti-corrosion system specified for the outside of the tank.
J. The entire surface and all components inside and an additional area of (250pc) of the exterior shall be part of the anti-corrosion coating and preparation of the surface to the grade of NACE No.1 White Metal Blast Cleaning, this includes but

is not limited to (manholes, nozzles, chime, walls(shell), internal divider walls, buffer area of all UV-exposed walls- non-immersion areas, butt gutters and their components, flanges, saddles, reinforcing plates, anchor bolts, MH covers, stairs, props, pipes, overflow, pipe supports, angles, angles, brackets of fiberglass panels, valves, posts, angles, Unistrut's, stiffener , etc.).

1. The interior surface area for preparation to NACE No.1 grade and application of Ceramic Lining is approximately 3,000(pc) three thousand square feet. The contractor will be responsible for making its own area calculations for the coating material estimate.

K. The scope of work inside the tank included NACE No.1surface preparation and application of a system equal or with better performance than Chesterton ARC S2-Epoxy Ceramic Reinforced Lining to the entire floor, all internal walls, supports, channels, non-submerged wall stops, and all interior components to NACE No.1 / White Metal Blast Cleaning.

L. The scope of work inside the tank includes surface preparation and application of a system equal or with better performance than Chesterton ARC 858-Epoxy Ceramic Reinforced Filler Lining to an additional area of (250pcs) to the grade of NACE No.1/White Metal Blast Cleaning. Adry weight of 1/16" in: (62.0mils) DFT for the calculation of the required material. This material will be applied in areas and zones that have been lost due to corrosion not exceeding 50% of the original thickness of the steel member.

M. The scope of work inside the tank includes the application of a system equal or with better performance than PPG PSX-700 siloxane epoxy coating to the stop and top area of all tank walls and channels. This coating will be applied over the Chesterton ARC S2 product and will have a width of (3') feet. The approximate coating area shall be approximately: 500 (pc) sq. ft. The dry thickness for the PPG PSX-700 will be: 4.0 mils (dft).

N. Maintenance will be performed on the outside of the tank where sandblasting will be performed to NACE No. 2 SSPC-SP10 Near White Metal for areas with corrosion until an anchor profile of 3 @ 5 mils is reached to apply a system equal or with better performance than ARC 858 filler material [(performance for 858 (50pc)] followed by a layer of a system equal or with better performance than Amercoat 240 product epoxy in thickness of 5 mils. For the tank area to be removed, it should be done in combination of the surface preparations to the grade SSP C-SP1, SSPC-SP2 & SSPC-SP3, and then apply 2 coats of a system

equal or with better performance than the PSX700 topcoat in thickness of 5 mils. In the areas or zones where the base metal is exposed a system equal or with better performance than Amercoat 240 epoxy must be applied first at 5 mils DFT prior to the application of the topcoat. The contractor is responsible for performing the exterior area calculations for the estimation of materials and labor for this item.

O. This includes sealing on the outside of the perimeter of the tank between the steel floor plate of the tank and the concrete floor to prevent moisture from entering through the bottom of the floor plate. A groove must be made in the tie of the concrete floor and the steel tola to apply the Sika Flex 1A product. The thickness of the system will be in accordance with the manufacturer's technical data.

P. The contractor and/or sub-contractor must have no less than 5 years of experience in tank rehabilitation and must include evidence of at least three references of similar complexity work with their proposal. Proposals that do not meet this requirement will not be accepted.

Initial Scope of work

Manufacture and Delivery BFWP 5,000 HP Motor

A. Scope

These Technical Specifications are prepared for the purchase of two new horizontal solid shaft induction motor to drive Aguirre Steam Plant Unit 1 or 2 Boiler Feed Water Pumps. The new motor shall be interchangeable with the existing ones in use at the plant.

New motor, in the future, will be connected in series to the existing Boiler Feed Water Pump (tandem connection). The front end of motor 1 will be connected to the pump and the rear end will be connected to motor 2.

The motor shall be delivered within 300 consecutive days after Notice to Proceed. Two motors shall be delivered to the Aguirre Steam Plant.

B. Kind of Service

The new motor shall be used as a substitute to existing equipment of the same capacity (5,000 hp), shall be designed to fit in the existing bases **without modifications to existing facilities**, and shall be capable to drive the existing horizontal pumps.

Available technical data for the driven equipment to be mechanically coupled to the motor to be purchased is provided as follows:

General Type	Boiler Feed Water Pump Elect Utility Pump
Manufacturer	De Laval Turbine, Inc
Type	Barrel Type BFP 9BB3I310 Shaft Driven Pump
Stages	9 stages twin suction, double case
RPM	3,570-3,600
Rotation	Clockwise (looking toward pump)
GPM	4,500
BHP	9,000
Pump Rated Capacity	2,000,000 lbs/hrs
Suction Press	168 psi
Discharge Press	3,018 psi
Discharge Head	7,835 Ft
Curves	See drawings attached

C. Ambient operational conditions

The motor will be installed at sea level and will operate in a tropical climate zone, at an ambient temperature of 40 C. Motor will be operated continuously at full load during a natural year (8,760 hours). This equipment

will be operated at an area subject to severe dust and mild salt spray due to prevailing winds. Hurricane winds of 150 miles per hour (50 lb/ft^2) may be originated at the area where the motor will be installed, and it shall be capable of withstanding these winds without damage or negative effects on its operational characteristics.

D. Capacity and performance

The new motor shall be of general-purpose characteristics, with heavy-duty design and construction. The new induction motor shall be squirrel cage type, horizontal, solid shaft and shall replace the existing 5000 horsepower motors in operation. The characteristics of the new motor shall be identical to existing (original) motors characteristics but with modern design and construction, high operational efficiency and the specified horsepower rating (5000 HP).

E. Type of equipment to be acquired

1. Standard manufacturing

Unless inconsistent with this specification, the contractor shall supply equipment of standard construction as per industry manufacturing standards and policies for the construction of electrical motors.

2. Standards and applicable codes

Unless otherwise specified herein, the latest applicable standards of the American National Standards Institute (ANSI), Institute of Electronic and Electrical Engineers (IEEE), National Electrical Manufacturers Association (NEMA), Electrical Apparatus Service Association (EASA), and all other applicable standards or codes of other organizations related to electrical motors design, construction or operation, shall govern.

3. Construction

The equipment shall be manufactured to operate within appropriate safety standards, taking in consideration not only the equipment, but also the operating personnel. It shall operate in a proper way within the operational requirements described or implied in this specification without undue strain, wear, heating, vibration, corrosion, or other operational troubles.

4. Materials used in motor construction

   The equipment and all its components and parts shall be capable of operating at high temperatures or other severe conditions, and they shall be manufactured with the best available materials adequate for the required service. Toxic or other hazardous materials, parts or paints shall not be used. GENERA PR may require, at any moment, the Material Safety Data Sheet of any product used in the manufacture of this equipment.

5. Replacement parts

   Parts subject to wear, corrosion or other deterioration, or requiring adjustment, inspection, or repair caused by normal use shall be accessible and capable of reasonable and convenient removal when required. Diagrams and/or instruction manuals for the replacement of such parts shall be provided with the motor.

6. Threads of bolts, nuts, stud and screws

   Bolts, nuts, studs and screws shall have threads conforming to ANSI Standards, preferably in integer unit measurement (whole numbers) in the English System. In the event that the equipment and its threaded components are constructed using the metric system, this fact shall be indicated in the "Exceptions" of the Proposal and in the quotation submitted to Genera PR. Only hexagonal nuts shall be used.

7. Lifting points

   Threaded holes to attach eye bolts of standard size in the English

System and of common use, shall be provided on the external frame of the motors to allow the lifting of the equipment in a safe manner including the heaviest components.

8. Support points

Support points provided by the manufacturer shall be designed for reasonable convenient connection to the foundations or supports at the installation site.

9. Electrical insulation materials

Insulating materials used in motor construction shall be of the best quality available and shall comply with the latest ANSI, NEMA, IEEE Standards, and the Electric Apparatus Service Association (EASA). The use of asbestos material is totally prohibited.

10. Conflicts or discrepancies

In case of conflict between standards, the more stringent requirements will apply.

F. Proposal required information

Bidders shall include the following information in their proposals. Bid proposals not including the required information will be rejected and considered not responsive.

1. Compliance with latest standards and organizations:

Bidders shall certify that the proposed motor complies in its design, construction and materials used, with the latest applicable standards and regulations from the following organizations:

a. American National Standard Institute (ANSI)
b. National Electrical Manufacturers Association (NEMA)

c. Institute of Electrical and Electronics Engineers (IEEE)
d. National Electric Code (NEC)

2. Technical information required

Contractor shall provide technical information related to motor performance and manufacture. This shall include drawings showing all the dimensions and technical specifications of the proposed motor.

Motor operational characteristics recommended and maximum limits of electrical and mechanical parameters like current, voltage, efficiency, power, temperature, vibrations, etc., shall be included also. See Article III.F of the Special Conditions: "Required Information with Bidders Proposal and Evaluation Factors" for detailed requirements.

3. Electric insulation

Details of insulation class and treatment given to stator coils of motor shall be included with the Proposal support documentation.

G. New motor electrical specifications

The following information defines PREPA requirements for the new motor to be supplied by means of this specification. These requirements are based on existing motors nameplate data, and the operational experience with existing equipment. Requirements in this section may be stricter than original requirements to correct existing problems with old equipment.

1. Design requirements

The new induction motor shall be squirrel cage type as per the following specifications:

New Motor Electrical, Physical and Operational Specifications	
Generic Design and Motor Type	Horizontal Squirrel Cage Induction Motor
Horsepower Capacity	5,000 HP

New Motor Electrical, Physical and Operational Specifications	
Stator Winding Configuration	Wye
Nominal/Rated Voltage	4,000 VAC
Locked Rotor Amps	3524 (data from existing motor)
Phases	3
Frequency	60 Hz
Differential Protection Current Transformer Ratio Type	800/5 (Existing GE Type JKM-3)
Type od Squirrel Cage Motor and Electrical Characteristic	Normal starting torque characteristic and normal starting equivalent to NEMA design B motors
Rotation	Bidirectional
Insulation	Class F
Temperature Rise @ 1.15 SF	90⊠ C
Service Factor	1.15
Enclosure	Weather Protected WPII
Duty	Continuous
Full load Current	632 A (Data from existing motors)
Stator RTD's	10 Ohm Copper 25°C
Bearing Thermocouples	Copper Constantan Dual Element, Type T
Rotor and Stator	Copper
RPM	3,570
Frame	8512Z
Motor Heater Rating	120 V, 800 W, 1 PH

2. Other requirements

a. Rotation and axial play

The shaft rotation shall be bi-directional, with an appropriate motor endplay, adequate to the specific characteristics and specific application of the motor as per NEMA MG 1-2021.

b. Service Factor

The motor shall be capable to be loaded up to 1.15 times its nominal capacity of 5000 HP and its load equivalent in amperes at nominal voltage, frequency and temperature, without exceeding the 90°C temperature rise.

c. Frame and foundations

The frame of the new motor shall be of similar physical characteristics and dimensions of existing motor frames, in order for the new motor to be installed **directly and without modifications** to the existing installations or bases at the plant.

The supplier is sole responsible to check and verify in place the actual dimensions in order that new motor shall be installed directly and without modifications to the existing bases and/or facilities. On indicated required field verification visit, supplier shall also thoroughly inspect existing motors foundations sole plate or grouting as applicable, to determine the possible need to perform repair/re-construction work on this part of existing installation. The contractor is responsible to expressly notify PREPA on its bid proposal of any and all identified work required or recommended to be performed on foundations before new proposed equipment installation.

d. Winding insulation temperature measurement

e. This temperature shall be measured by a minimum of six-10 ohms RTD's, factory embedded and equally distributed around stator winding (360 degrees). The temperature rise specified shall never be exceeded by any part of the operating equipment, nevertheless that the motor be operated continuously at its maximum electrical and mechanical power, including its additional capacity provided by the service factor specified above its nominal capacity.

f. Bearing thermocouples and thermometers

Each motor bearing shall be provided with **dual element, type T thermocouples (copper-constantan)** provided with its wiring and independent connection box. See Section H.13.d.

Each bearing shall also be provided with one dial thermometer, helix type bimetal element, 3-inch diameter head (minimum), 0.5 inch NPT male connection nut, rugged 304 SS construction, 0°F to 240°F dial range, 2° divisions, back connection and an appropriate stem length for the application.

g. Thermal resistors

The motor shall be provided with thermal heating resistors (space heaters) of the adequate capacity to operate at 120 volts, one phase, 60 Hertz. Space heaters shall be cartridge type. The space heaters shall never be in contact with stator windings. The motor shall include an independent connection box of appropriate size with the provisions to connect the heaters to the existing facilities. The thermal resistor will be installed to transfer the heat to the core instead of the winding, keeping at least 10□C over the environment (ambient) temperature (approximately 40□C), ensuring that no internal water vapor condensation occurs inside the new proposed equipment.

h. New motor base

The new motor shall include eight holes equally spaced around the base, to provide flexibility and facilitate the installation of the motor in the existing motor-pump bases.

i. Lighting Arrestors and Three Phase Protection Capacitors

The new motor shall be supplied with NON-PCB surge protection three phase capacitor and internal discharge resistor. The new capacitors shall have adequate capacity in order to minimize starting motor power surge.
The surge protection capacitors and the discharge resistor shall be provided and installed as part of the external motor connection box and shall be used to complete the physical connection of the incoming feeder lines and power leads.

3. Electrical insulation technical requirements

a. General characteristics

The motor shall be provided with class F (non-hygroscopic) insulation with design and operational characteristics adequate to be operated in an ambient and conditions usually found in power plants. The motors are located in a tropical zone near sea level. The insulation shall have anti-fungi properties. The insulation shall have integrity and shall be sealed and made with materials capable of protecting against the detrimental effects of high (100%) relative humidity, oil and chemicals.

b. Insulation methods

Insulation method required for the conductors, coils and material in motor windings shall be **vacuum pressure impregnated ("VPI")** or solventless B-stage Epoxy-resin rich tapes. Whenever VPI is not utilized, after coils are completed, the stator assembly shall be completely flooded by immersion with the best available dirt resistant insulating

varnish, drained and baked, producing a sealed, dry and smooth external winding surface. Conventional winding insulation methods not expressly indicated in this section will be rejected. Any insulating method used on motor fabrication shall improve coil performance and motor life in severe environments and eliminate all corona-generating points on the windings.

c. Windings and end turns

The windings and end turns shall be firmly braced and firmly secured to avoid vibrations. The contractor, supplier or manufacturer shall verify that end turns do not interfere with the installation and removal of the motor rotor, with its normal operation and with the future assembly and disassembly.

4. Starting and operating requirements

To being able to evaluate Bidder's proposal, the following information, expressly confirming requirements fulfillment as specified or differences as applicable, shall be provided on bid proposal.

a. Rotation

Motor electrical and mechanical characteristics shall allow the motor rotation and cooling system to be bidirectional.

b. Starting characteristics

The new motor minimum starting torque requirements shall be 100% of the load. The breakdown torque shall be equal or greater than 250% of the full load torque. The motor shall be capable of across the line starting, and accelerating with 100% mechanical coupled load, up to rated (nominal, nameplate) speed including the service factor required.

The motor shall be capable of two consecutive starts, additional starts should be according to starting restrictions of induction motor, as per NEMA MG 1-2021. A separate starting information plate should be supplied on the motor.

c. Operational voltage limits

The motor shall be designed to be capable of across the line starting with ninety percent (90%) nominal voltage on its power leads and accelerating with 110% mechanical coupled load, up to rated (nominal, nameplate) speed including the service factor required.

Also, the motor shall be capable of continuous operation at full load with ninety percent (90%) nominal voltage on its power leads, satisfying the starting requirements in a range between 90% to 110% of nameplate's nominal operation voltage (NEMA MG 1-2021).

d. Operational currents limits

Full load current when operating within ten percent (10%) of rated voltage shall not exceed by more than fifteen percent (15%) rated full load current (1.15 times) including the power factor.

e. Operational time and starting current limits

1) The real starting current of the motor shall not exceed the established limits of KVA per horsepower.

2) The locked rotor time interval shall be equal or greater than the maximum acceleration period when the equipment is started with maximum load, including the service factor, at minimum voltage limit (80% of the nominal voltage), without any detrimental effect to the operating equipment.

f. Winding temperature increment

Winding real temperature increment, when operating the equipment continuously at its nominal full load and mechanical capacity, including the specified service factor, shall not exceed the temperature rise limits as specified and required.

g. Grounding connections

Motor shall have provisions for grounding according to the latest NEMA MG 2-2014 revision, National Electric Code and all other applicable standards. The motor shall have two (2) suitable grounding pads, one located on main conduit lead box side of motor, and the other in opposite side, both on or near the frame base, capable of accepting #4/0 AWG copper conductors for this purpose.

5. Rotor specifications

a. General

Motor rotor bars and rings of the squirrel cage type shall be constructed using copper or copper alloys approved for this kind of equipment with appropriate structural reinforcements for adequate operation and failure prevention. **Proposals offering motors with aluminum conductors/bars will be rejected**.

The number of rotor flutes shall not be equal to the number of poles of the motor to permit the use of predictive equipments without electrical interference or distortion.

b. Mechanical balance of the rotor

The rotor shall be statically and dynamically balanced (at its nominal load and speed) in accordance with the requirement of the standard MG-1-2021 and its latest recommendations and revisions. When a new mechanical coupling is requested to be included with the motor, the balance shall be done with the whole coupling installed on the motor.

c. Vibrations

The vibrations of the motor, at its maximum load and nominal speed, shall be tested, measured and not exceed the maximum amplitude recommended as per IEEE Standard 7-16-1969 as revised 9-15-1982, NEMA MG1-1998, API 541 or its most recent revisions. In relation to the equipment characteristics referred to the horizontal, vertical and axial vibrations, the supplier shall submit for any equipment supplied to the Authority, the following:

- Estimated horizontal, vertical and axial vibrations as expected for the equipment.
- Tolerable limits of vibration in normal operation and recommended limit for shut down.
- Vibration and current spectrum of the equipment manufactured for PREPA.

Note: The manufacturer may supply these data in his preferred measurement units, but it shall include at least one set of data in inches/second.

d. Design, materials and construction

New motor design, materials and construction shall secure the most reliable service; the best operation characteristics, oscillation elimination and the lower possible noise measured as per IEEE Standard 85 and its latest revision.

H. Mechanical specifications

1. Motor bearings

Heavy-duty sleeve bearings are required by PREPA, preferably of the outboard type. They shall be of easy removal, bi-directional, split housing, and lubricated by means of a self-lubrication system. The bearings shall be constructed as per NEMA and any other applicable standards for the design, for the materials to be used and for the construction of motor bearings for the specific application of the reference motor. Bearings shall be appropriate to operate under the conditions established for the motor operation. They shall be sealed against leaks and vapors of the lubricant to the interior of the motor. They shall also be sealed externally against the incoming moisture, dirt and dust.

The bearing housing shall provide, for each bearing, in an adequate location, drain plugs that could be easily removed when necessary. Lines with adequate valves shall be provided to allow for oil sampling for each bearing and/or for the main tank(s) of the lubricant. These lines for oil sampling shall not be taken directly from the bottom of the bearing or tank reservoirs where sludge precipitates (to avoid sediment in the samples). Facilities to add and remove oil easily shall be provided. Ball bearings will not be accepted as an alternative to the main proposal. Proposals of motors with ball bearings will be rejected.

Proponents shall quote for two spare sets of bearings as an option to be evaluated at GENERA PR, LLC discretion, one for each motor. Each set will include a front-end bearing assembly and one rear end assembly. Each assembly must include the following: housing, bearing liners, bearing seals and lubrication rings. If the assemblies are identical, two shall be provided.

2. Lubrication system

The motor shall be provided with two (2) split sleeve bearings, as described on Item H.2 below, designed to operate by means of a self-lubrication system, presently in service with the existing motor. The lubricant or oil shall be supplied to the bearing or equipment during its start up, operation and shut down by means of the

required lubrication system.

3. Bearing electric insulation

One of the motor bearings shall be electrically insulated to eliminate the possibility of circulating eddy currents through the shaft and journal with their detrimental effects. One and only one of the bearings shall be designed and constructed to drain or allow the current flow to ground without any detrimental effects to the equipment.

4. Mechanical coupling

The new motor shall use existing couplings without any required modification. Bidders are responsible for the verification of the coupling type and its dimensions at the existing equipment. If the new motor needs a different coupling, then it shall be included with the motor without additional cost to GENERA PR. The load side of the coupling shall be supplied without perforation (blind).

5. Frame

The new motor frame shall be similar to the existing motors physical characteristics and shall be designed for its direct installation without any modifications to the existing bases and power connection facilities, as specified in Articles B.1 and G.2.c.

Any repairable difference or discrepancy between the offered or supplied equipment and the existing installation or equipment shall be explicitly indicated in the Exceptions section of the Proposal.

No matter the provided information and drawings of these motors, the supplier is sole responsible to check and verify in place the actual dimensions of the frame, in order to design and provide a new

motor that can be installed directly and without modifications in all the existing bases and/or facilities.

6. Minimum information required in the nameplate

The nameplate of the new motor shall provide all the information required by the standards ANSI C50.41, NEMA MG 1-2021 and its later revisions. Also, the following additional information is required:

a. Rotation, specifying whether fan blade changes are needed or not.

b. Displacement limits of the magnetic center of the motor at full speed and load and location of marks for its verification.

c. Number and frequency of allowable start-ups and their restrictions.

d. Electrical configuration of the winding (wye, delta, etc.) and designation or name of the connecting terminals.

e. The identification of each bearing shall be done in accordance with the Anti Friction Bearings Manufacturers Association (AFBMA) and the bearing manufacturer.

f. Type and characteristics of the lubricant or recommended lubricants.

g. Mechanical rotation in relation with the phase sequence of the incoming line.

h. Space heaters operating parameters: capacity, voltage, watt, current, etc.

i. Type and characteristics of all the temperature detectors required and installed in the motor.

j. Serial number unique and specific for the equipment.

k. Name and location of the factory which manufactured the equipment.

l. Total weight of the motor and individual weight of the rotor and the stator.

m. Material(s), design, capacity, construction characteristics and number of bars of the rotor. This information is necessary to set the vibrations monitor equipment and its program.

The identification plates shall be constructed in stainless steel and fixed permanently to the motor located where it can have any easy access and reading. The information shall be printed off set or stamped on the surface of the plate.

8. Inspection Peepholes

Motors with sleeve bearings shall have inspection peepholes to visually inspect lubricant flow and ring sight gauges to see the oil level and condition. They shall be constructed using clear glass. The sight gauge shall be provided with drain plug for easy removal for each one of the bearings.

9. Allowable axial displacements

The maximum axial displacement allowed to the shaft, motor end-play, shall be as required in the Article G.2.a. This should be measured from both ends of displacement up to the magnetic center of the rotor at maximum load and nominal speed. The magnetic center and its allowable limits shall be clearly indicated and identified on the journal housing and/or on the motor frame.

10. Frame characteristics

The motor frame shall be designed so that it can be easily cleaned without the necessity of dismantling the equipment for this purpose. Cooling vents shall be provided with stainless steel protectors or screens and reusable air filters with their filter housing. Filters shall be provided. **The required external housing is Weather**

Protected Type II (WPII).

11. Connection boxes characteristics

The connection boxes for the power leads, RTD's, thermocouples, lighting arrestors, capacitors and heaters shall be of appropriate dimensions and with enough space to allow the connection and disconnection easily. The connection boxes shall be located in accordance with the existing motor boxes location or as per supplied diagram by GENERA PR if a written requirement is made by the bidder or supplier.

12. External protective paint

All the external components exposed to the ambient or subject to heating being fabricated from cast iron, iron, steel or carbon steel shall be painted in factory with at least two layers of the best quality paint in the market and shall be heat, oil and dirt resistant. They shall resist ambient effects as they apply in accordance with the best industry practices on the equipment manufacturer.

All the other components and parts made in iron, steel or steel alloys, not exposed to the ambient or subject to high temperatures, shall be finished in factory with at least one priming coat plus a second external coat in order to obtain minimum thickens of 4.5 mils. The primer should be a red iron oxide zinc chromat alkyd of 0.75 to 1 mil adequate to protect equipment against corrosion in the conditions and location of the equipment in a tropical zone. The outer paint layers shall be as per manufacturer standard color or as per instructions supplied by GENERA PR through its representative. Motor external frame and parts shall be completely painted. No lead-based paints shall be used.

13. Personnel qualifications and labor development requirements

All work shall be performed and completed in a thorough workmanlike manner and shall follow the best modern practice in the manufacture of materials and apparatus of the type covered by this specification, without any omission from the specification or drawings. All parts shall be made accurately and to standard gauge, where possible, so as to facilitate replacement and repairs.

14. Requirements to adapt the motor to existing facilities

a. Power leads

Stator leads shall extend at least **36 inches** beyond the frame. The power conductors shall be constructed of super stranded copper conductor or approved copper alloys of the appropriate gauge for this particular application. The conductor insulation shall be super flexible with the required voltage capacity. The holes in the stator frame through which the leads extend shall be equipped with insulated bushings or substantial non-degradable material, designed to protect leads from chafing due to bending or friction. They shall be of ample dimension to permit them to be securely fastened to the frame. Motor leads shall have sufficient ampacity that total temperature of the conductor will not exceed the temperature according to ANSI/NEMA C50.41-2012.

b. Space heater cables

The space heater cables shall be provided with weatherproof electrical terminals and shall be brought out to a separated weatherproof connection box, which shall be used exclusively for this application.

c. RTD and thermocouples cables

The stator temperature detectors and bearing thermocouples cables shall be brought out to a separate terminal weatherproof box on the motor frame for convenient connection. The leads and conductors shall be appropriate for this application.

d. Bearings thermocouples and thermometers

Motor bearings shall be equipped with dual element, type "T" thermocouples (copper-constantan), to be used to obtain temperature readings in the lubricated area. Thermocouple leads shall be brought out to terminals located on an appropriate connection box at head assembly (see Item H.14.c). Insulated holders shall be used as required to prevent static pick-up. The head assemblies shall be arranged for convenient connection to GENERA PR existing conduits. The leads and conductors should be designed and constructed for this application.

Bearings shall also be equipped with one dial thermometer, helix type bimetal element, 3-inch diameter head (minimum), 0.5 inch NPT male connection nut, rugged 304 SS construction, 0°F to 240°F dial range, 2° divisions, back connection and an appropriate stem length for the application.

e. Noise contamination

The no load overall sound power level (dBA reference, 10^{-12} watts) of this motor shall be less than 85 decibels when measured in accordance with IEEE Standard 85;

and ANSI/NEMA C50.41-2012 or latest revisions.

f. Winding temperature detectors

Stator winding temperature shall be measured by six (factory embedded) resistance temperature detectors (RTD's) 10 ohms at 25□C. (two RTD's per phase configuration). They shall be located and equally distributed around the 360 degrees of the winding. The leads and conductors shall be designed and constructed for this particular application.

g. Inspection windows

Two inspection windows (if applicable) shall be provided, one on each side of the housing. These windows shall have handles and gaskets to protect them from the ambient. They shall be of the appropriate dimensions to allow cleaning and inspection of the motor.

15. Range of Preferred Weight

New motor total weight shall not exceed existing motor weight of 17,300 lbs. However, GENERA PR reserves the right to approve and accept new equipments proposed with additional weight up to 15% above existing motor weight.

I. Tests

1. General

The manufacturer shall make all necessary tests to ensure his material and workmanship are of the required degree of excellence and that the equipment furnished by him shall perform as specified and guaranteed. All tests shall be conducted in accordance with the latest applicable tests codes for this type of equipment from the National Electrical Manufacturers Association, the American National Standard Institute, the Institute of Electrical and Electronics Engineers and other related organizations.

The manufacturer shall provide GENERA PR all data obtained from the equipment tests as required. The obtained values shall be tabulated in each and every one of the tests and written certified including the graphs and curves obtained. Any test failure due to inability to meet appropriate parameters as required by GENERA PR and as proposed and guaranteed by the contractor, shall be considered sufficient cause for motor rejection.

2. Factory/Shop acceptance tests

Factory acceptance tests are required by PREPA.

The following minimum tests shall be made on the motor during factory acceptance tests:

a. Measurement of winding resistance

b. Magnetic center determination

c. Air gap measurement

d. Bearing temperature rise at running speed

e. No-load readings of current, voltage, power and nominal speed at rated voltage and frequency

f. Mechanical vibration

g. Direction of rotation versus phase sequence

h. Insulation resistance

i. High-potential test

j. Determination of locked-rotor (zero-speed) torque and current

k. Determination of speed-torque curve

l. Determination of speed-current curve

m. Temperature tests

n. Sound measurement as per IEEE 85

o. Shaft voltage test as per IEEE 112.9.4

p. Determination of efficiency and power factor at 100% load

The results of the tests shall be sent to PREPA within five (10) days after their completion and before equipment shipment to PREPA.

3. Motor efficiency tests

Motor efficiency shall be determined using IEEE 112 test method F. The results of the efficiency tests shall be used to determine motors compliance with the efficiencies offered and guaranteed by the contractor in his proposal. Failure to meet guaranteed efficiency shall be considered sufficient cause for motor rejection.

4. Alternative or simulated Tests

When operational factory acceptance tests at nominal voltage, current and/or speed can not be accomplished at manufacturer facilities due to sound and valid reasons including under capacity to operate the motor, then alternative tests as simulated tests at lower than nominal capacities can be utilized. Alternative tests shall be authorized by PREPA in written, depending on the validity of the reasons to satisfaction. The obtained values shall be tabulated in each and every one of the tests and written certified including the graphs and curves obtained. The results shall be sent to the PREPA within five (5) days after the tests completion and before the equipment shipment to PREPA.

5. Additional tests

PREPA reserves its right to perform all necessary electrical tests to the motor or additional tests using its personnel or third-party contractors before or after the final acceptance and installation at PREPA discretion.

J. Motor Drawings and Instruction Manuals

Supplier shall supply in addition to the final AS BUILT set of drawings, a digital copy of motor drawings and operational curves compatible with. Motor instruction manuals shall be included also in Adobe Acrobat Reader (.pdf) format. Two sets in original of the motor instruction manuals shall also be provided.

Initial Scope of Work

Improvements to the Pier and Replacement of Sections of Fuel Oil Pipelines

The work includes providing labor, supervision, materials, equipment, inspection and everything necessary for Improvements to the Pier and Replacement of Sections of Fuel Oil Pipelines at. Aguirre Power Plant, located in Salinas PR

The Contractor will inspect and address everything necessary for the rehabilitation and replacement of 12- and 8-inches diameter Bunker-C and Diesel pipeline sections including multiple of the supports and structural components of this operational infrastructure facility. The scope of work includes the rehabilitation, by repair, replace and coating system on the entire exterior surface of the pipeline and related structural support elements. The utilities impacted under this scope were used for the fuel oil supply needs in Aguirre Steam Plant Units 1 & 2 respectively.

In addition, the rehabilitation of the existing pile support type foundation at the Fuel Oil Receiving Dock is required to be rehabilitated using a *Pile Encapsulation*

System designed to address these issues attained to marine and industrial environment and applications. Such System shall be in accordance with technical specifications an applicable codes described on *Special Considerations to be Addressed Under this Scope of Work* described below.

Whereas necessary it will be the responsibility of the contractor to store and identify the parts, equipment, and mechanical attachments of the utility under repair in a safe and protected area to prevent damage. After the completion of the rehabilitation work, he will be in charge of assembling all the parts and equipment and will leave the mechanism operable. Any hardware required for the reinstallation of the equipment again will be the responsibility of the contractor, it is allowed to reuse the existing hardware that is in good condition and not corroded. The contractor should consider that during the re-installation of the equipment, any incidental damage to the interior cladding must be repaired at its own cost and following the manufacturer's recommendations for repair.

Special Considerations to be Addressed Under this Scope of Work

1. All existing coating must be removed from the entire area of the pipe to be rehabilitated, modified and/or repaired. Then, the surface preparation and application of the coating system will be carried out according to the technical specifications and special conditions. The location of the pipe sections and elements related will be identified and selected by Genera-PR in a previous NDT Inspection to be supplied as part of the contract specifications.
2. The scope of work includes the preparation of the surface with abrasive media to the grade of NACE No.2 or "Near White Wet Abrasive Blast Cleaning / SSPC-SP 10 (WAB)/NACE WAB-2" with a Flash-Rust grade no greater than NACE WAB-2 L (Light) and application of anti-corrosion coating to the entire area of the pipe impacted by the rehabilitation work, beams, columns, structural supports, saddle plates, U-bolts, all installed

components, steel areas exposed to the environment, and all impacted areas.

3. All existing coating (paint) must be removed from the entire area of the pipe to be rehabilitated, modified and/or repaired.
4. Lead Inspection Test shall be performed prior any activities takes place.
    a. If necessary, Lead abatement of existing surfaces will be performed.

5. All repairs of weld patches must be tested with a Penile Dye Non-Destructive Test (*NDT Penetrant Tints-PT).*
6. All welds shall be made in such a manner as to ensure complete fusion with the base metal, within the limits specified for each joint and strictly following the Qualified Procedure.
7. Welders must be qualified for the type of work to be performed. The contractor shall submit to the project manager on behalf of Genera PR the qualification of the welder and the substance of his qualification. Only procedures qualified by the company will be accepted to carry out the welding work.
8. Whereas necessary Handling, cutting, fabrication, beveling, removal coating will be performed by the contractor.
9. Radiographic (RT) X-Rays tests shall be included at 100% of the welds in the pipe sections which will be replaced, according to ASME code B31.3 (ASME Code for Pressure Piping, B31) and B16.5 (Pipe Flanges and Flanged Fittings)**.** Include ASNT inspectors and perform NDT – PT Penetrant Liquid tests on all welds in the pipe, according to ASME code B31.3 Latest edition Including Inspection (VT) and Final Report of all welding work performed on the project by a CWI@ASME-AWS certified welding inspector.
10. Whereas necessary the works includes the cutting and installation of steel plates on the concrete bases:
11. All repairs in pipelines, supports and related components shall comply with current building codes (ACI-318, ASTM, ASME, AISC, ICRI, UBC-IBC)

and others that apply according to their latest editions. The design and details must be submitted to Genera-PR for evaluation.

12. Whereas necessary Pipelines/Utilities Lettering will be supplied by Contractor.
13. All work described shall be performed by experienced personnel and in accordance with the best practices of:
    a. NACE "National Association of Corrosion Engineers"
    b. SSPC "The Society of Protective Coatings"
    c. ISO *"International Organization for Standardization"*
    d. EPA
    e. OSHA
    f. API "American Petroleum Institute"
    g. ASME "American Society of Mechanical Engineers"
    h. ASNT "The American Society for Nondestructive Testing"
    i. ASTM "American Society for Testing Materials"
    j. Agencias locales y estatales con jurisdicción
    k. ACI "American Concrete Institute"
    l. ICRI "International Concrete Repair Institute"
    m. AISC "American Institute of Steel Construction"
    n. UBC-IBC "Uniform Building Code-International Building Code"
    o. All others that apply

VI. Cost Estimate

Item	Description	Cost
	ASP Nautilus Rehabilitation Project (3 tanks)	$1,550,000.00
	Improvements to the Pier and Replacement of Sections of Fuel Oil Pipelines	$3,250,000.00
		$4,800,000.00

VII. Environmental & Historic Preservation ("EHP") Requirements

A. Other than design, planning and non-destructive due diligence studies, no construction work will commence prior to the issuance of specific expressed written FEMA approval for the specific scope of work. FEMA required EHP compliance review will precede the execution of each proposed scope of work submitted by PREPA through its agent Genera PR to FEMA. PREPA through its agent Genera PR is aware of its responsibility for coordinating, notifying, obtaining permits, and complying with applicable federal, state, and local laws, regulations, and executive orders and understands that failure to comply with EHP requirements will jeopardize FEMA funding.

B. See the following for general methods of repair and list of equipment to be used:

a. Dismantle & Salvage
- Complete testing for any containments or hazardous waste.
- All contaminated materials will be delivered to the approved waste disposal as per Disposal Management Plan.
- If equipment is to be salvaged, it will be loaded and removed from the site.
- All debris will be taken to the approved waste disposal facility as per the Waste Management Plan.

C. List of Equipment to be used but it is not limited to the following:
   - Crawler Crane
   - Semi-truck with low-bed trailer
   - Man lift

D. Removal of vegetation
   - N/A.

E. List the type of debris:
   - Metal scrap, domestic waste, wood.
   - The debris will be separated and taken to an approved waste disposal facility. Location permits and supporting documentation will be provided at closeout.

F. Description of Staging Area:
   - N/A – only minor equipment staging near the existing equipment to be dismantled and installed.

G. Hazardous Material:

a. Describe the activity and the hazardous material involved. Calculate the quantity to be generated or disposed and include the management and disposal plan.
   - The identified hazardous materials that can be found in the Generation Plant are asbestos, PCBs, Lead, SF6 gas, oil from the transformer & breakers. These hazardous materials, will be handled, and disposed of as per Federal and State Laws.
   - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations
   - These products and their residues will be stored in special covered areas for disposal by an authorized company and provided with temporary spill controls until collected. All paint

containers and curing compounds will be tightly sealed and stored when in use. Excess paint will not be discharged to the storm system, but properly disposed of, according to the manufacturer's instructions.

- Material amounts will be provided by a certified management contractor performing a site evaluation calculation for asbestos and lead paint.
- Prior to the start of any equipment dismantling activities, inspections for the presence of asbestos will be conducted by a trained and certified contractor.
- All asbestos waste found at the Generation Plant will be disposed of at an approved landfill designated by the Department of Environmental Health & Safety. All asbestos waste generated will be bagged and transported in accordance with all applicable State and Federal regulations. There will be no exceptions.
- Any asbestos spills will be cleaned up immediately to prevent the dispersal of fibers. Prudence will be exercised to avoid contamination of laboratory facilities or exposure of personnel to asbestos. Asbestos spills will be cleaned up with wet methods and/or a High-Efficiency Particulate-Air (HEPA) filtered vacuum.

b. If the project includes building demolition with asbestos, provide a copy of the EQB approved plan or evidence of plan submission.

- Not Applicable.

c. If the project includes disposal of damaged transformers or wood poles with creosote, include the management and disposal plan. The plan must include the final disposition site.

- Transformers and pole disposal will be handled as per the Waste Disposal Management Plan. GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
- The removal of the transformer will require testing of the existing oil for PCB's levels, drain oil, and delivery to the approved waste disposal site as per Environmental Regulations.

- Removal of wood poles with creosote treatment will be handled according to the Federal and State Laws.

H. Water Crossings:

a. Specify if the project will affect a waterway or body of water.

- Not Applicable

b. Modification of a body of water or wetland: Does the project require dredging, excavation, disposal of material, adding fill material that might result in any modification of a body of water or wetland designated as "waters of the U.S."?

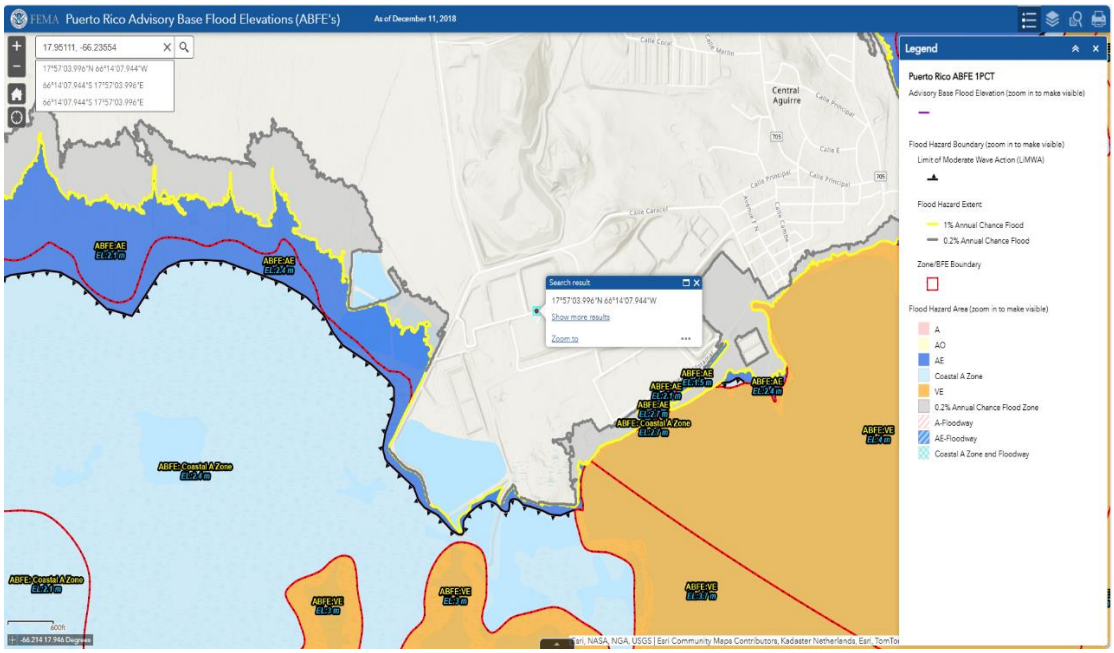
- Not Applicable

c. Does the project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?

- Not Applicable

d. Flood zone: Is the project located in a flood zone, floodway or will it have a negative impact on the flood zone?

- The Generation Plant is in Flood Zone A (SFHA per ABFE). Equipment replacement only. No negative impact.
- In accordance with the updated version of FEMA Region II Memorandum, dated October 10, 2017, Guidance for the use of Available Flood Hazard Information for the Government of Puerto Rico in complying with FEMA Policy 104-008-2, 44 CFR Part 9, and Executive Order 11988 (Floodplain Management). All hazard mitigation proposals under alternative procedures must be designed using the best available flood hazard data and in compliance with applicable regulations and policy.



I. Structure Age:

a. Provide the construction date of any buildings or structures within the project. Include those near the project.

- Not Applicable.

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San Juan, PR 00918

b. Provide date and information of any prior repairs, remodeling and/or rehabilitation of the property. Include current and previous use of building or structure.
    - Not Applicable.
c. If a building includes both older and newer sections, confirm which section of the building the work is being done.
    - Not Applicable
d. Include plans, drawings, blueprints, any architectural documentation available for new construction or substantial improvements regardless of the age of the building or structure.
    - Not Applicable
e. Provide at least five color pictures of every structure or building, showing the four facades and the contextual view. Include additional pictures of architectural details. Also provide pictures of buildings (45 years old or older) on the proximities.
    - Not Applicable.

J. Ground Disturbance
a. Provide a description of the new ground disturbance by giving the dimensions (area, depth, volume, etc.), if any. Include an aerial photo map showing the extent of the disturbance with coordinates.
    - Not Applicable.

b. The project SOW will not affect water or sewer utility services.
c. Indicate the prior/current use of the area to be impacted.
    - Not Applicable. Area is an existing Generation Plant. 100% of the work to be completed will be within the existing and already impacted Generation Plant perimeter.

d. Explain how materials will be stockpiled and disposed of.
    - Not Applicable.
    - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
e. Specify final disposition site.

- The disposal of materials will be handled as per the Waste Management Plan.

K. Soil Stabilization measures:
   a. Does the project involve any soil stabilization measures?
      - No

L. Required Permits

List of the permits needed for Costa Sur Site:

- Environmental Compliance Determination in Oficina de Gerencia de Permisos
- General Consolidate Permit – OGPe
- Genera Will provided proof of all permits as a Condition of FEMA Record of Environmental Considerations (REC).

I. Overview

Project Name:	1. Hot Gas Path Inspection Unit 1-4 2. Gas Turbine 2-3 Major Repair ACC 3. Gas Turbine Rotor Inspection & Repair 4. ASP CC Condensate Tank 2 - LELM
Project Type:	428 ISOW
Project Location:	Central Aguirre, Puerto Rico 00704
Latitude/Longitude :	17.95111, -66.23554
Version : 0	

II. Introduction

PREPA is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns the power plants for electric generation, transmission, and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 3.4 million people. Genera-PR is the operator authorized under a Public-Private Partnership agreement of the thermal generation facilities of Puerto Rico. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair and improvement. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements.

On September 6, 2017, Puerto Rico's northern coastline was struck by Hurricane Irma, a Category 4 storm. Two weeks later, on September 17, Hurricane Maria tore through the island of Puerto Rico as a Category 5 storm. Subjected to 150+ mph winds and more than 25 inches of rain, 3.4 million residents lost power and a great deal of infrastructure, including critical facilities, was damaged. In particular, the electrical infrastructure suffered catastrophic impacts. In the aftermath, diligent recovery and reconstruction have been going on, not only to restore the electrical infrastructure to pre-storm function and capacity, but to take this opportunity to bring it in line with current standards and technology. With the recovery funding available, "*Everyone can be sure that we are working responsibly to achieve efficiencies, reduce costs, decommission inefficient and polluting plants, and continue to transform our electrical system for the benefit of our economy and our people*" as Governor Pedro Pierluisi said, this being an opportunity to not just to rebuild the system but to transform it into a smarter, more resilient, and cleaner one. Puerto Rico's generation system must meet customer demand and have adequate additional capacity to comply with the reserve required by the standard operating procedures of the T&D system operator (LUMA). In terms of service continuity, the system must be reliable so that service interruptions are within the margins established in the electrical industry standards.

In 2020 the situation became more complicated when earthquakes events 4473DR-PR provoked more damages to Costa Sur Power Plant. Later, in September 2022, Hurricane Fiona 4671DR-PR also impacted Puerto Rico, destroying even more the already fragile generation assets. Unfortunately, the generation system presents critical performance metrics with a deficiency in capacity to meet the energy demand and the minimum reserve requirements. The forced outage percentage of the units is increasing while the generation capacity decreases. This

combination of factors puts the continuity of the service at high risk, adversely affecting the quality of life of those who live in PR.

Genera is responsible for operating and maintaining PREPA's legacy asset generation fleet pursuant to the Generation O&M Agreement. The current fleet condition presents poor performance due to the impact of hurricanes María and Fiona. Generation capacity has been reduced to 46% of installed capacity. In addition, of the generation units in operation, about 32% or 640 MW, are disconnected monthly, causing thousands of customers to suffer interruptions in their service.

The Puerto Rico Electric Power Authority (“PREPA”) is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns and operates electric generation, transmission and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 1.5 million customers. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair and improvements. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements. On January 2023, PREPA and the Puerto Rico Public-Private Partnership Authority (“P3 Authority”) selected Genera PR, LLC (“Genera”) to operate, maintain and modernize the Generation system of PREPA for ten years through a public-private partnership.

To improve the system's reliability, Genera proposes to submit for approval the Detailed Scope of Work (SOW) to COR3 and FEMA for the project 669815 under DR-4339-PR Public Assistance. The document provides a description of the project including scope, schedule, and cost estimates as well as Environmental & Historical Preservation ("EHP") requirements.

The project location can be seen in Figure 1.

Figure 1: Project Location

III. Project Description

PREPA's Generation System Program was developed and is being executed using the industry standards, following the equipment's manufacturer recommendations and PREPA policies. Periodical inspections, tests are performed to identify critical component repairs/replacement in equipment such as boilers, turbines, generators, power transformers, circuit breakers, protection and control relays, grounding mats, and auxiliary equipment.

Genera PR proposes to perform necessary repair and/or replacement of critical generation components pursuant to the Generation O&M Agreement between PREPA, the P3A, and Genera PR.

A detailed SOW version will be submitted to FEMA per facility.

Aguirre is located on the south coast of Puerto Rico in the Salinas municipality and is owned and operated by PREPA. The Plant has two 450-MW thermal steam power generation units, two 296-MW combined cycle (CC) power generation units that can also operate in simple-cycle mode, and two 21-MW black-start capable gas turbines (GTs). The nameplate capacity of the Plant is 1534 MW (gross), including the units that are currently out of service for repairs

The two 450-MW thermal units, referred to as Units 1 and 2, were commissioned in 1971 and 1972, respectively. A 1991 upgrade to 500 MW on their General Electric (GE) (formerly ABB) steam turbines (STs) is based on 3430-kilopound/hour main steam flow at 2400 psig and 1000°F and hot reheat conditions of 594 psig and 1000°F. Boiler restrictions on steam flow have limited the units to their original 450 MW. The boilers burn heavy fuel oil (HFO) and are tangentially fired models by Combustion Engineering, now GE Power.

IV. Codes and Standards

The following will be referenced when applying specific codes, specifications, and standards to the project design:

- Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR, February 2020.
- Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
- FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
- Rus 1730B - The referenced standards, as defined and as per their requirements, state every system is required to have an Emergency Restoration Plan (ERP) in the event of a major failure or storm event.
- LUMA Operation Reserve Standard - LUMA, as the T&D System Operator, is responsible for ensuring that the system has enough generation resources to function properly. This is also known as resource adequacy. To fulfill this responsibility, LUMA has set a standard for Operational Reserve Capacity. The formula used to determine this capacity is detailed below, with Genera's input in the second column. LUMA may choose to modify the formula or inputs used, such as averages, without input from Genera.

V. Initial Scope of Work (work to be complete and/or % work completed)

A) Hot Gas Path Inspection Unit 1-4

The purpose of the project is to complete the Hot Gas Path Inspection (HGPI) and Generator Rotor Installation for the Unit GT 1-4, performing various inspections and repair works and reassembling the generator's rotor.

The HGPI includes the removal of the complete combustion system and a detailed inspection of the turbine nozzles and turbine buckets. To perform the HGPI, Contractor shall supply the TA, supervision and resources to lift up the upper half of the Turbine Casing and the Stage 1 Turbine Nozzle. The nozzles, shrouds and rotor buckets will be inspected visually by the TA while still in place in the unit. In no mayor concerns are detected in the visual inspection, Contractor shall reassemble the unit, including the replacement of major components.

GAS TURBINE - Work to be completed:

- General Electric, 50MW capacity. Output voltage 13.8KV.
- OEM: GE Energy Power
- Model: MS7001B modified to EA by GE Power
- SN: 238023
- Fired hours: 21,080 on Distillate #2 fuel

Mechanical Works

1. Perform disassembly of 1ea gas turbine, including generator rotor for repair, inspection, clearances work.
2. Perform assembly of 1ea gas turbine and generator rotor.
3. Perform final report on all the specific work performed, including tests reports, submittals, progress reports.

B) Gas Turbine 2-3 Major Repair ACC

This project consists of a repair and Inspection of the Frame 7000 Combustion Turbine Unit 2-3, located at Aguirre Combined Cycle power plant.

TURBINE GENERATOR - Work to be completed:

Mechanical Works

1. Perform disassembly of 1ea turbine rotor for repair, inspection, and re-furbishment work.
2. Perform assembly of 1ea turbine rotor.
3. Perform final report on all the specific work performed, including tests reports, submittals, progress reports.

C) Gas Turbine Rotor Inspection & Repair

This project consists of repair and Inspection to Gas turbine rotor.

TURBINE ROTOR - Work to be completed:

Mechanical Works

1. Perform disassembly of 1ea turbine rotor for repair, inspection, balance and refurbishment work, as per OEM specifications.
2. Perform assembly of 1ea turbine rotor.
3. Perform final report on all the specific works performed, including tests reports, submittals, progress reports.

D) ASP CC Condensate Tank 2

Tank #2 at Aguirre Combined Cycle Plant, this scope includes, but is not limited to, the remotion of the existing tank, design and build of a new tank, new valves, and tank concrete base rehabilitation. The dimensions of the new tank shall be D=26 ft. H=32 ft., with a nominal capacity of 127,092. The

new tank shall be fitted with a spiral stairway, self-supported umbrella roof, top platform (6 ft. x 6 ft.), level indication, level transmitter, grounding, tank identification, stainless steel isolation valves, etc. Tank design shall be based on the latest revision of API-650 and ASCE 7-16 code. A complete internal and external coating system shall be applied as per specifications. The contractor shall be responsible for all required rigging, safety, permits and the appropriate store of the coatings, grit blast material, and equipment.

All pipes, valves, and pumps adjacent and related to the New Condensate Tank #2 at Aguirre Combined Cycle Plant shall be replaced due to unreliable conditions caused by an aggressive corrosion. Condensate Make-Up Pumps (2) and Deaerator Emergency Make-Up Pumps (2) shall be replaced. Partial demolition and reconstruction of pumps concrete bases shall also be included. All piping headers shall be replaced.

SITE: Work to be completed

1. Remove and replace 3ea of luminaries Eaton Champ FMVA FMVA20L

CONDENSATE TANK #2: Work to be completed

Existing Condensate Tank

1. Remove and properly dispose 1ea existing steel tank
   - Fabricated in place 1ea new 26ft[dia.] x 32ft[height]steel tank. Capacity 127,092 gals
   - As per codes API-650 & ASCE 7-16
2. Perform demolition 1ea concrete pad
3. Perform construction for 1ea reinforced concrete pad

GeneraPR

Piping System:

1. Remove and replace 10 dia. sch 40 seamless carbon steel pipe deaerator dump headers, including insulation.
2. Remove and replace 12 dia. sch 40 seamless carbon steel pipe deaerator emergency make-up pumps suction header, including insulation.
3. Remove and replace 8 dia. sch 40 seamless carbon steel pipe deaerator emergency make-up pumps discharge header, including insulation.
4. Remove and replace 4 dia. sch 40 seamless carbon steel pipe deaerator emergency make-up pumps recirculation, including" insulation.
5. Remove and replace 4 dia. sch 40 seamless carbon steel pipe condenser make-up pumps suction header, including insulation.
6. Remove and replace 6 dia. sch 40 seamless carbon steel pipe condenser make-up pumps suction header, including insulation.
7. Remove and replace 4 dia. sch 40 seamless carbon steel pipe condenser make-up pumps discharge header, including insulation.
8. Remove and replace 1-1/2 dia. sch 40 seamless carbon steel pipe condenser make-up pumps recirculation, including insulation.
9. Remove and replace 2 dia. sch 40 seamless carbon steel pipe condensate return, including insulation.
10. Remove and replace 3ea of 12 dia. Carbon steel 150psi flanged gate valves.
11. Remove and replace 2ea of 8 dia. Carbon steel 150psi flanged gate valves.
12. Remove and replace 3ea of 6 dia. Carbon steel 150psi flanged gate valves.
13. Remove and replace 7ea of 4 dia. Carbon steel 150psi flanged gate valves.
14. Remove and replace 2ea of 8 dia. Carbon steel 150psi flanged swing check valves.
15. Remove and replace 4ea of 4 dia. Carbon steel 150psi flanged swing check valves.
16. Remove and replace 2ea of 1-1/2 dia. Carbon steel 150psi flanged swing check valves.

17. Remove and replace 2ea of 4 dia. Carbon steel 150psi flanged globe valves.
18. Remove and replace 2ea of 1-1/2 dia. Carbon steel 150psi flanged globe valves.
19. Remove and replace 12ea of 1 dia. Carbon steel 150psi ball valves.

Pumps:

20. Remove and replace 2ea of condensate pumps.
21. Perform demolition 2ea concrete pad for condensate pumps.
22. Perform construction for 2ea concrete pad for condensate pumps
23. Remove and replace 2ea of deaerator emergency pumps.
24. Perform demolition 2ea concrete pad for deaerator emergency pumps.
25. Perform construction for 2ea concrete pad for condensate pumps

VI. Estimate Cost:

A) Hot Gas Path Inspection (HGPI) and Generator Rotor Installation for the Unit GT 1-4: $ 2,200,000.00

B) Major Inspection Aguirre Combined Cycle Unit 2-3: $ 9,500,000.00

C) Gas Turbine Rotor Inspection & Repair: $ 2,100,000.00

D) ASP CC Condensate Tank 2: Cost $2,000,000.00

Estimated cost for Project: $ 15,800,000.00

VII. Environmental & Historic Preservation ("EHP") Requirements

A. Other than design, planning and non-destructive due diligence studies, no construction work will commence prior to the issuance of specific expressed written FEMA approval for the specific scope of work. FEMA required EHP compliance review will precede the execution of each proposed scope of work submitted by PREPA through its agent Genera PR to FEMA. PREPA through its agent Genera PR is aware of its responsibility for coordinating, notifying, obtaining permits, and complying with applicable federal, state, and local laws, regulations, and executive orders and understands that failure to comply with EHP requirements will jeopardize FEMA funding.

B. See the following for general methods of repair and list of equipment to be used:

a. Dismantle & Salvage
   - Complete testing for any containments or hazardous waste.
   - All contaminated materials will be delivered to the approved waste disposal as per Disposal Management Plan.
   - If equipment is to be salvaged, it will be loaded and removed from the site.
   - All debris will be taken to the approved waste disposal facility as per the Waste Management Plan.

C. List of Equipment to be used but it is not limited to the following:
   - Crawler Crane
   - Semi-truck with low-bed trailer
   - Man lift
   - Forklift

D. Removal of vegetation
   - N/A.

E. List the type of debris:
- Metal scrap, domestic waste, wood.
- The debris will be separated and taken to an approved waste disposal facility. Location permits and supporting documentation will be provided at closeout.

F. Description of Staging Area:
- N/A – only minor equipment staging near the existing equipment to be dismantled and installed.

G. Hazardous Material:

a. Describe the activity and the hazardous material involved. Calculate the quantity to be generated or disposed and include the management and disposal plan.
- The identified hazardous materials that can be found in the Generation Plant are asbestos, PCBs, Lead, SF6 gas, oil from the transformer & breakers. These hazardous materials will be handled, and disposed of as per Federal and State Laws.
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- Material amounts will be provided by a certified management contractor performing a site evaluation calculation for asbestos and lead paint.
- Prior to the start of any equipment dismantling activities, inspections for the presence of asbestos will be conducted by a trained and certified contractor.
- All asbestos waste found at the Generation Plant will be disposed of at an approved landfill designated by the Department of Environmental Health & Safety. All asbestos waste generated will be bagged and transported in accordance with all applicable State and Federal regulations. There will be no exceptions.
- Any asbestos spills will be cleaned up immediately to prevent the dispersal of fibers. Prudence will be exercised to avoid contamination of laboratory facilities or exposure of personnel to asbestos. Asbestos spills will be cleaned up with wet methods and/or a High-Efficiency Particulate-Air (HEPA) filtered vacuum.

b. If the project includes building demolition with asbestos, provide a copy of the EQB approved plan or evidence of plan submission.

- Not Applicable.

c. If the project includes disposal of damaged transformers or wood poles with creosote, include the management and disposal plan. The plan must include the final disposition site.

- Transformers and pole disposal will be handled as per the Waste Disposal Management Plan. GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
- The removal of the transformer will require testing of the existing oil for PCB's levels, drain oil, and delivery to the

approved waste disposal site as per Environmental Regulations.

- Removal of wood poles with creosote treatment will be handled according to the Federal and State Laws.

H. Water Crossings:

a. Specify if the project will affect a waterway or body of water.

- Not Applicable

b. Modification of a body of water or wetland: Does the project require dredging, excavation, disposal of material, adding fill material that might result in any modification of a body of water or wetland designated as "waters of the U.S."?

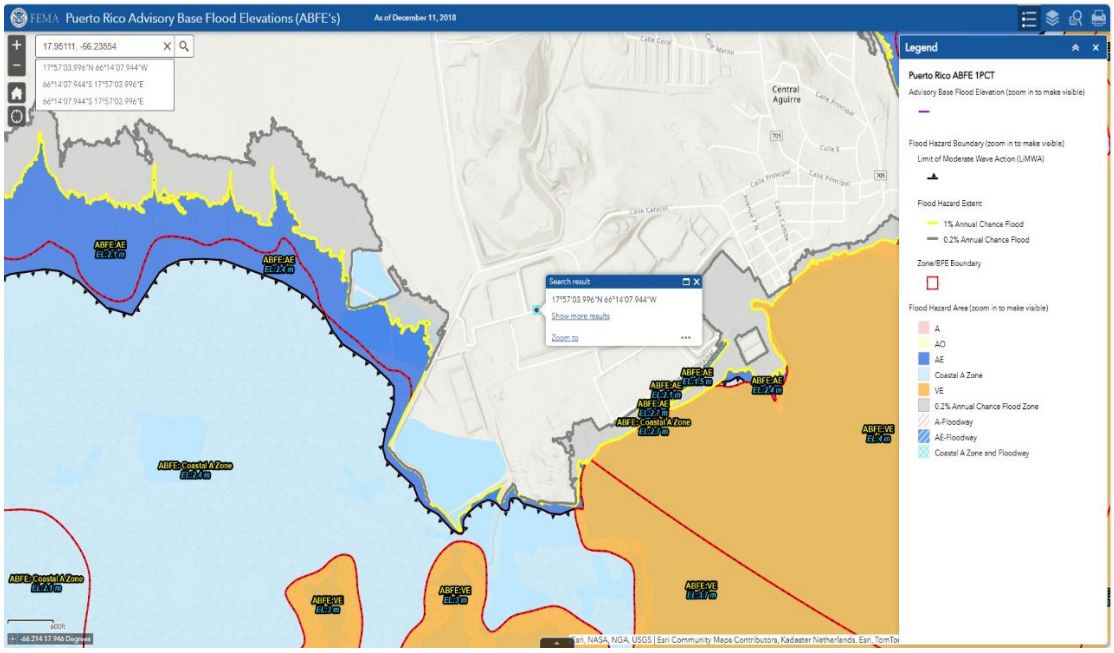
- Not Applicable

c. Does the project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?

- Not Applicable

d. Flood zone: Is the project located in a flood zone, floodway or will it have a negative impact on the flood zone?

- The Generation Plant is in Flood Zone A (SFHA per ABFE). Equipment replacement only. No negative impact.
- In accordance with the updated version of FEMA Region II Memorandum, dated October 10, 2017, Guidance for the use of Available Flood Hazard Information for the Government of Puerto Rico in complying with FEMA Policy 104-008-2, 44 CFR Part 9, and Executive Order 11988 (Floodplain Management). All hazard mitigation proposals under alternative procedures must be designed using the best available flood hazard data and in compliance with applicable regulations and policy.



I. Structure Age:

a. Provide the construction date of any buildings or structures within the project. Include those near the project.

- Not Applicable.

b. Provide date and information of any prior repairs, remodeling and/or rehabilitation of the property. Include current and previous use of building or structure.
    - Not Applicable.
c. If a building includes both older and newer sections, confirm which section of the building the work is being done.
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d. Include plans, drawings, blueprints, any architectural documentation available for new construction or substantial improvements regardless of the age of the building or structure.
    - Not Applicable
e. Provide at least five color pictures of every structure or building, showing the four facades and the contextual view. Include additional pictures of architectural details. Also provide pictures of buildings (45 years old or older) on the proximities.
    - Not Applicable.

f. Provide an aerial photo map with the GPS coordinates of each structure.
    - Refer to Figure 1

J. Ground Disturbance

a. Provide a description of the new ground disturbance by giving the dimensions (area, depth, volume, etc.), if any. Include an aerial photo map showing the extent of the disturbance with coordinates.
    - Not Applicable.

b. The project SOW will not affect water or sewer utility services.
c. Indicate the prior/current use of the area to be impacted.

- Not Applicable. Area is an existing Generation Plant. 100% of the work to be completed will be within the existing and already impacted Generation Plant perimeter.

d. Explain how materials will be stockpiled and disposed of.
   - Not Applicable.
   - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.

e. Specify final disposition site.
   - The disposal of materials will be handled as per the Waste Management Plan.

K. Soil Stabilization measures:

a. Does the project involve any soil stabilization measures?
   - No

L. Required Permits

List of the permits needed for Aguirre Site:

- Environmental Compliance Detremination in Oficina de Gerencia de Permisos (OGPe)
- General Consolidate Permit – OGPe
- Genera will provide proof of all permits as a Condition of FEMA Record of Environmental Considerations.

I. Overview

Project Name:	1. PSSP Demineralized Tank 2 2. PSSP WTP Multimedia Filters 3. WTP Acid & Soda Pumps Replacement
Project Type:	428 ISOW
Project Location :	Ruta del Encanto, Toa Baja, PR 00949
Latitude/Longitude :	18.219464, -67.160675
Version : 0	

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To improve the system's reliability, Genera proposes to submit for approval the Detailed Scope of Work (SOW) to COR3 and FEMA for the 662957 under DR-4339-PR Public Assistance. The document provides a description of the project including scope, schedule, and cost estimates as well as Environmental & Historical Preservation ("EHP") requirements.

The project location can be seen in Figure 1.

Figure 1: Project Location

III. Project Description

PREPA's Generation System Program was developed and is being executed using the industry standards, following the equipment's manufacturer recommendations and PREPA policies. Periodical inspections, tests are performed to identify critical component repairs/replacement in equipment such as boilers, turbines, generators, power transformers, circuit breakers, protection and control relays, grounding mats, and auxiliary equipment.

Genera PR proposes to perform necessary repair and/or replacement of critical generation components pursuant to the Generation O&M Agreement between PREPA, the P3A, and Genera PR.

A detailed SOW version will be submitted to FEMA per facility.

Palo Seco is located on the northern coast of Puerto Rico in the Cataño municipality near San Juan and a location with approx. 36 acres lot, and project is approx. 2.5 acres lot (131,912 ft²). The Plant consists of four thermal steam units, six Hitachi-GE gas turbines (GTs), and three Pratt & Whitney Power Systems (PWPS) FT8 MOBILEPAC GTs with a total nameplate capacity of 809 MW. Palo Seco has been a major generator in the PREPA fleet and continues to serve on a limited basis as current power distribution challenges face the island.

Palo Seco Steam Plant Units 1 and 2 are tangentially fired Combustion Engineering ("CE," now GE Power), heavy fuel oil-fired (HFO-fired) boilers with reheat and a nameplate capacity of 85 MW each. The units are rated 1450 psi, 1000°F, and the boilers are 857.7 MMBtu/h. Unit 1 began commercial operation in 1960, and Unit 2 began commercial operation in 1961.

Palo Seco Steam Plant Units 3 and 4 are tangentially fired CE HFO-fired boilers with a nameplate capacity of 216 MW each. The steam turbines are rated 1800 psi, and the boilers are 1971 MMBtu/h. Additional details about the boilers and turbines were not provided for review. The units began commercial operation between 1967 and 1968.

IV. Codes and Standards

The following will be referenced when applying specific codes, specifications, and standards to the project design:

- Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR, February 2020.
- Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
- FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
- Rus 1730B - The referenced standards, as defined and as per their requirements, state every system is required to have an Emergency Restoration Plan (ERP) in the event of a major failure or storm event.
- LUMA Operation Reserve Standard - LUMA, as the T&D System Operator, is responsible for ensuring that the system has enough generation resources to function properly. This is also known as resource adequacy. To fulfill this responsibility, LUMA has set a standard for Operational Reserve Capacity. The formula used to determine this capacity is detailed below, with Genera's input in the second column. LUMA may choose to modify the formula or inputs used, such as averages, without input from Genera.

V. General Initial Scope of Work

A) PSSP WTP Multimedia Filters

The required work will be based on the global cost of the project. This will be coordinated and integrated to obtain a uniform job stream. The work required the design, fabrication and installation of three (3) Multimedia Filters (MMF), including but not limited to pressure vessels, valves, pumps, pressure and flow transmitters, pressure gauges, piping and structural frames. These filters are located at the Southwest corner of the Wastewater Treatment Plant (WWTP). The scope will also include the removal of the existing MMF system. The new system operation shall be identical

to the existing one. The contractor shall provide a system with a similar arrangement of vessels, valves, instruments, pumps and piping. Nevertheless, PREPA has revised the material of fabrication to stainless steel 304L for all vessels. The system shall include three (3) vessels with a normal filtration capacity of 150 GPM (200 GPM intermittent) for each vessel. The total capacity of the system should be 450 GPM for normal service (600 GPM intermittent). The system shall include in the arrangement three semiautomatic bypasses: filter inlet to waste header, filter inlet to outlet header and filter backwash to waste header. The existing Foxboro DCS will control the system.

MULTIMEDIA FILTERS [MMF]: Work to be completed

Mechanical System:

Pumps:

1. Remove and replace 3ea of 72in [dia.] x 72in [high] Stainless steel 304L Pressure vessels, including filter media.
2. Remove and replace 2ea Backwash pumps, including accessories.
3. Remove and replace 2ea Surface wash pumps, including accessories.

Piping & Specialties:

1. Remove and replace 4 dia. sch 40 seamless carbon steel piping
2. Remove and replace 6 dia. sch 40 seamless carbon steel piping
3. Remove and replace 2 dia. sch 40 seamless carbon steel piping
4. Remove and replace 3ea of 4in [dia] Automatic Flow Control Ductile Iron Epoxy Coated 150# Lug Style Butterfly Valves.
5. Remove and replace 6ea of 6in [dia] Automatic On/Off Ductile Iron Epoxy Coated 150# Lug Style Butterfly Valves.
6. Remove and replace 9ea of 4in [dia] Automatic On/Off Ductile Iron Epoxy Coated 150# Lug Style Butterfly Valves.
7. Remove and replace 3ea of 6in [dia] Manual Ductile Iron Epoxy Coated 150# Lug Style Butterfly Valves.
8. Remove and replace 3ea of 2in [dia] Manual Stainless Steel FNTP Ball Valves.
9. Remove and replace 3ea of 1in [dia] Combination Air Valves.

10. Remove and replace 3ea of Differential Pressure Type Indicator Flow Transmitters for 4in [dia] piping.
11. Remove and replace 3ea of Differential Pressure Type Indicator Transmitters.
12.

Electrical System:

13. Remove and replace 1ea of NEMA 4X 316L Electrical Enclosure.
14. Remove and replace PVC Coated Rigid Electrical Conduits

B) PSSP Demineralized Tank 2

Build a New Demineralized Water Tank #2 at Palo Seco Steam Plant. The scope includes, but is not limited to, demolition of the existing base, demolition of the existing tank, design and build of new reinforced concrete base, design and build of new tank, replacements of valves and new tanks levels control manifolds. The dimension of the new tank shall be like the existing (D=35 ft. H=24 ft.). The new tank shall be fitted with a spiral stairway, self-supported umbrella roof, top platform (10 ft. x 6 ft.), level indication, level transmitter, grounding, tank identification, stainless steel isolation valves, etc. Tank design shall be based on the latest revision of API-650 and ASCE 7-16 code. A complete internal and external coating system shall be applied as per specifications. The contractor shall be responsible for all required rigging, safety, permits and the appropriate store of the coatings, grit blast material, and equipment. The scope includes the procurement, fabrication, and installation of three (3) tank level control valve manifolds for Demineralized Water Tank #2, Demineralized Water Tank #4, and Condensate Tank 1-2.

Work to be completed

SITE:

1. Remove and replace 3ea of luminaries Eaton Champ FMVA FMVA20L

TANK:

1. Remove and properly dispose 1ea of 35ft [dia] x 24ft [height] existing steel tank
2. Fabricate in place 1ea 35ft [dia] x 24ft [height] steel tank.

3. Perform demolition 1ea concrete pad
4. Perform construction for 1ea

Piping & Specialties:

1. Remove and replace 2ea of 12 dia. Isolation 316L Stainless steel gate valves.
2. Remove and replace 9ea of 6 dia. Isolation 316L Stainless steel gate valves.
3. Remove and replace 3ea of 6 dia. Bypass 316L Stainless steel gate valves.
4. Remove and replace 3ea of 6 dia. Level Control 316L Stainless steel ball valves.
5. Remove and replace 3ea of 4 dia. Isolation 316L Stainless steel gate valves.
6. Remove and replace 2ea of 12 dia. Isolation 316L Stainless steel gate valves.
7. Remove and replace 1ea of 8 dia. 316L Stainless steel valve at Demi Header #1 to Demi Header #2 Interconnection
8. Remove and replace 1ea of 4 dia. 316L Stainless steel valve at East Equalization Spool
9. Remove and replace 1ea of 4 dia. 316L Stainless steel valve at North Equalization Spool
10. Remove and replace 1ea of 4 dia. 316L Stainless steel valve at North Equalization Header

Controls Instrument:

Demi Water Tank #2

11. Remove and replace 1ea of 6 dia. Level Control Manifold 316L Stainless steel, including wiring.

Condensate Tank #2

12. Remove and replace 1ea of 6 dia. Level Control Manifold 316L Stainless steel, including wiring.

Condensate Tank 1-2

13. Remove and replace 1ea of 6 dia. Level Control Manifold 316L Stainless steel, including wiring.

c) WTP Acid & Soda Pumps Replacement

SCOPE OF WORK

The required work will be based on the global cost of the project. This will be coordinated and integrated to obtain a uniform job stream. The two types of chemicals are Sodium Hydroxide (NaOH @ 50% concentration, AKA Caustic Soda) and Sulfuric Acid (H2SO4 @98% concentration). Both chemicals are used for pH control at the Water Treatment Plant (WTP) Retention Tanks, the sulfuric acid is also utilized at the flocculation tanks outlet sump and the Sodium Hydroxide is also employed at the APH neutralization tank. The work required the procurement, fabrication and installation of three (3) Sodium Hydroxide Process Pumps, two (2) Sulfuric Acid Process Pumps and two (2) Sulfuric Acid Dosing Pumps. The scope will also include the demolition-removal of all existing pumps (8 Sodium Hydroxide pumps & 7 acid pumps), concrete pumps bases rehabilitation, concrete dikes rehabilitation, suction piping, isolation valves, power-instrumentation conduits and wiring. The new system operation shall be identical to the existing one. Contractor shall provide a system with a similar arrangement of pumps, valves, instruments, and piping.

EXPANDED TASKS LIST

1. Mobilization
2. System Design – Skid mounted pumps with integrated open sides shelter.
3. Existing system demolition-removal
    a. Eight (8) Sodium Hydroxide Pumps
    b. Seven (7) Sulfuric Acis Pumps
    c. No concrete demolition required (0 yd3)
4. Rehabilitation of concrete dikes including:
    a. Surface preparation for concrete repairs, includes removal of existing damaged coating.
        i. Sodium Hydroxide Dike: 24’ x 5’ = 120 ft2
        ii. Sulfuric Acid Dike: 20’ x 5’ = 100 ft2
    b. Concrete repair with epoxy putty and mortar.
    c. Surface preparation for epoxy lining.
        i. Sodium Hydroxide Dike: 24’ x 5’ = 120 ft2

ii. Sulfuric Acid Dike: 20' x 5' = 100 ft2

d. Surface coating with glass flake filled novolac vinyl ester epoxy (Ceilcote 222HT)

i. Sodium Hydroxide Dike: 24' x 5' = 120 ft2 @ 25 mils DFT

ii. Sulfuric Acid Dike: 20' x 5' = 100 ft2 @ 25 mils DFT

5. Skid mounted systems fabrication shall include roof cover with open sides, structural steel using carbon steel I-Beam elements, all steel shall be shop coated with Genera's Coating System #1

a.Skid #1: Three (3) Sodium Hydroxide Process Pumps.
Canned Motor Centrifugal Pump
Existing: ChempPump G Series GVHS-5L-1S
New Series: ChempPump G Series GVHS

b. Skid #2: Two (2) Sulfuric Acid Process Pumps
Plunger/Diaphragm Control Volume Pump
Reference: Milton Roy FR165B-48 SN 204336-1/2
New Series: mRoy XA/XB

c. Skid #3: Two (2) Sulfuric Acid Dosing Pumps
Plunger/Diaphragm Control Volume Pump
Reference: N/A
New Series: mRoy XA/XB

SECTION 09900

PAINT

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings of GeneraPR, general provisions and special conditions.

B. Whenever in these specifications there are listed specific brands and models of products, it will be understood as equal or approved equal to said products.

1.2 SUMMARY

A. This section includes the methods and requirements for surfaces

preparation and painting.

B. All exposed surfaces shall be painted, except for those specified. Surfaces that are not mentioned specifically will be painted equal to the adjacent surfaces that are similar. If the finished color has not been designated, the Engineer will select the standard color or available finished.

C. For tanks application the following areas of the interior shall be painted to a 100% of the surface: bottom, roof, columns, rafters, beams, shell, and columns support component. Tank exterior shall be coated entirely. This shall include manholes, manholes' flanged covers, reinforcing plates, anchors plates, anchors bolts, and pipe supports.

D. That equipment that will not be painted includes the parts that have movement, like the equipment that are mentioned ahead and the lights.

1. Valves
2. Fans and Axes of Motors
3. Sensors

E. Labels or Name Plates – All labels, name plates, UL and Factory Mutual labels or any kind of identification shall not be painted.

F. The contractor is responsible in providing all required equipment to make the work, including scaffolds, stairs, etc. The removal of this equipment is required once is finished the work. Contractor shall provide all required labor, supervision, materials, and quality control specialist.

1.3 DEFINITION

A. Paints: coating system (base, intermediate, finished), primers, sealants, enamels, epoxies.

1.4 REQUIRED DOCUMENTS

A. Product Literature: Manufacturer's technical data and instructions of paints to be used.

1. The paintings will be identified with the number and identification name of the manufacturer.

B. Samples for verification: Contractor shall provide samples with each color and material to be applied on representative samples of the present substratum. Each layer shall be defined. Representative colors shall be used when samples for revision are prepared.

C. The contractor shall submit the specific work plan for GeneraPR's approval before mobilization. This plan shall include the propose coating activities and schedule for delivery of products, equipment, and materials.

D. In case of using different products from those specified, the bidders will include in their proposal the technical information of the new product and its Material Data Sheets (MSDS, by its abbreviations in English) for evaluation and approval.

1.5 QUALITY ASSURANCE

A. Responsibility of a single source: To provide the layer for bases, intermediate and final coat, and mixing agents of the same manufacturer.

B. The Contractor's personnel shall be formally trained in the preparation, handling and application of the supplied products by the coating manufacturer. Written notification of such training shall be transmitted to GeneraPR's project manager.

C. Work Coordination: Revised other sections where the base layer is shop applied to guarantee system compatibility.

1. The Engineer shall be notified of any anticipated problems when using the specified materials.

D. Material Quality: Provide the manufacturer's best quality paint equal or like those specified.

1. Names used for colors or materials designated by the manufacturer, do not imply that other equivalent products of other manufacturers are excluded.

1.6 GENERAL REQUIREMENT

A. All work related with this specification shall be performed by experience personnel in accordance with the latest edition of the recommended practices by:

1. NACE
2. SSPC
3. EPA
4. OSHA
5. ASTM
6. ISO
7. Local and federal agencies

B. Contractor or sub-contractor shall be certified by the coating manufacturer as an applicator

C. Works with toxic materials shall be done following the actual applicable EPA and OSHA regulations.

D. The Contractor shall coordinate with the Engineer the use of electricity and water of the Power station, necessary to make the work. Any electrical devices or water to the working area is Contractor's responsibility.

E. The Contractor will provide and require to all his personnel the use of security equipment required by: OSHA, the Engineer or any other agency that have jurisdiction, when making the required works in this Specification.

F. All material or work done by the Contractor that differs from the drawings, specifications or contract can be rejected by the Engineer. Cost associated for replacement is at Contractor's responsibility.

G. It is Contractor's responsibility to certify that the documents for approval does not constitute deviation or changes to the specifications of the contract. Any deviation or change to the specifications of the contract, not certified in writing by the contractor, automatically disabled GeneraPR's seal of approval applied to any document related to this deviation or change.

H. All chemical products shall be approved or conditionally approved by GeneraPR.

I. Contractor shall be responsible for calculation of working area to determine products quantities.

1.7 DELIVERY, HANDLING AND STORAGE

A. All materials, parts and equipment shall be delivered at project site in its originals manufacturer's packaging, factory sealed and labeled with the following information:

1. Name of the product.
2. Description of the product (generic classification).
3. Number of the general specification, whenever apply.
4. Manufacturer's warehouse number and fabrication date.
5. Volume content.
6. Paints' mixing instructions.
7. Paints' application instructions.
8. Paints' number and color name.

9. MSDS

B. Contractor shall be responsible for the delivery, unpacking, storage, custody and manage of all materials and equipment for the job.

C. Instructions to follow:

1. Storage unused materials in its original package in a dry, closed, ventilated area, following manufacturer's storage recommendations.
2. Keep packages in use in optimal conditions, free from residuals and unrelated storage materials.
3. Keep storage area ordered and clean. Wastes removal shall be daily. The Contractor is responsible for the disposal in an adequate and authorized landfill.
4. Follow any necessary measure to assure the safety of workers and working areas against fire and health hazards, wrong handling during paint mixtures and applications.

D. The available source of electric energy for the Contractor at the project site is 120/208 VAC y 480 VAC, 3ø. It is bidder's responsibility to verify connection point during pre-bid meeting.

1.8 Working Conditions

A. To prevent quick drying, bulges, runny paint, and fast solvent evaporation, where is hazardous in a confined space, surfaces with a temperature over 100° F shall not be painted.

B. To ensure the preceding item, bidders shall visit the job site to verify the working conditions. Their proposals shall include an isolation system (plastic bubble) for exterior surfaces during surface preparation and coating application. For interior surfaces an air conditioning system shall be included in the proposal in case that required conditions (temperature and humidity) are not met during working hours (7:00 a.m. to 5:00 p.m.) or working days.

C. Painting in a rainy day is not permitted.

PART 2 PRODUCT

2.1 GENERAL

A. All products shall be approved by GeneraPR before entering the premises.

B. The volatile organic compound content of the products to be used shall be less than 3.5 lbs/gal (420 g/l).

C. Some of the products indicated in section 2.2 shall be re-evaluated in the " Oficina de Comunicación de Riesgos" if original evaluation was before 1998.

D. ONLY GeneraPR WILL DETERMINE IF THE ALTERNATE PRODUCT CAN BE CONSIDERED AS EQUAL OR APPROVED EQUAL.

E. Alternate product shall comply with the following conditions:

1. Same chemical and physical composition, including additives such as anticorrosive pigments, flakes, aluminum, etc.
2. Equal or greater solid content per volume.
3. Similar curing characteristics.
4. Equal or greater maximum dry temperature exposure.
5. Equal or greater maximum submerged temperature exposure.
6. Equal or lower functional cure time.
7. Equal or lower full cure time.
8. Equal or greater compressive strength under the same test conditions (ASTM D695).
9. Equal or greater flexural strength under the same test conditions (ASTM D790).
10. Equal or greater tensile strength under the same test conditions (ASTM D638).
11. Equal or greater elongation capacity under the same test conditions (ASTM D638).
12. Equal or greater adhesion capacity under the same test conditions (ASTM D4541).
13. Equal or greater Shore D Harness under the same test conditions.
14. Same system classification under ISO 12944 and NORSOK.
15. Equal or greater temperature range during application.

2.2 SYSTEMS

A. System 1: Coating system for steel surfaces on a severe environment.

1. Primer – Three component, polyamide epoxy, zinc-rich coating with a minimum of 70% solid content per volume. Approved product: *SHERWIN WILLIAMS ZINC CLAD III HS ORGANIC ZINC-RICH EPOXY PRIMER*.

Approved Alternate: *PPG AMERCOAT 68 HS*

2. Intermediate – a two component, low VOC, high build, self-priming, surface tolerant, lamellar aluminum flakes reinforced, polyamine bisphenol A epoxy with a minimum of 88% solid content per volume. Approved product: *SHERWIN WILLIAMS EPOXY MASTIC ALUMINUM II*.
Approved Alternate: *PPG AMERLOCK 400 AL*
3. Finish – Two component, high performance, low VOC, abrasion resistance, high gloss polysiloxane (epoxy siloxane hybrid) with a minimum of 90% solid content per volume. Approved product: *SHERWIN WILLIAMS SHER-LOXANE 800*.
Approved Alternate: *PPG PSX 700*

B. System 2: Coating system for steel surfaces on a severe environment where a limited to good surface preparation is required and medium temperature (max 302 °F) exposure.

1. Primer: Two components high build surface tolerant epoxy primer pigmented with aluminum and lamellar micaceous iron oxide and 80% solids by volume. Approved product: *INTERNATIONAL INTERPLUS 256*.
2. Intermediate: Two components high build surface tolerant epoxy maintenance coating pigmented with aluminum, NSF certification and 82% solids by volume. Approved product: *INTERNATIONAL INTERSEAL 670HS*.
3. Finish: Two components acrylic polyurethane with 68% solids by volume. Approved product: *INTERNATIONAL INTERTHANE 990HS*.

C. System 3: Lead removal system:

1. Approved product: *ENVIRO-PREP CHEMICAL STRIPPER 33073*

D. System 4: Coating system for fuel tank's interior.

1. Primer: Ultra high solids epoxy amine with 98% solid content per volume and ANSI/NSF 61 certified for portable water service. Approved product: *SHERWIN WILLIAMS DURA-PLATE UHS PRIMER*.
2. Finish: Ultra high solids, edge retentive epoxy with 98% solid content per volume and ANSI/NSF 61 certified for portable water service.

Approved product: *SHERWIN WILLIAMS DURA-PLATE UHS D*

E. System 5: Coating system for water tank's interior:

1. Primer: Ultra high solids epoxy amine with 98% solid content per volume and ANSI/NSF 61 certified for portable water service.
Approved product: *SHERWIN WILLIAMS DURA-PLATE UHS PRIMER*.

2. Finish: Ultra high solids, edge retentive epoxy with 98% solid content per volume and ANSI/NSF 61 certified for portable water service.
Approved product: *SHERWIN WILLIAMS DURA-PLATE UHS*.

F. System 6: Coating system for tank's interior where pH levels fluctuate (2-14 pH) with temperature up to 200°F:

1. Primer: Two component vinyl ester resin peroxide cured with 100% solid content per volume. Approved product: *KCC CORROSION CONTROL P3/P4 PRIMER*.

Alternate Approved Product: *CEILCOTE 370 HT*

2. Finish: Two component novolac vinyl ester resin, special flake filler, peroxide cured polymer system with 100% solid content per volume.
Approved product: *KCC CORROSION CONTROL VE 42*.
Alternate Approved Product: *CEILCOTE 222 HT*

G. System 7: Repair of Steel in Highly Erosive and Corrosive Submerge Service.

1. Filler and Base: Two component, bisphenol A resin with an aliphatic polyamine hardener, rebuilding putty reinforced with aluminum oxide and ceramics with a 100% solid content per volume. Approved product: *DUROMAR SAR CERAMIC PUTTY*.

2. Finish: Two component, bisphenol A resin with a modified aliphatic polyamine hardener, lining reinforced with aluminum oxide and ceramics with a 100% solid content per volume. Approved product: *DUROMAR EAC CERAMIC LINING*.

H. System 8: Repair of Steel in Highly Pitted and Deteriorated External Surfaces.

1. Filler and Base: Two component, bisphenol A resin with an aliphatic polyamine hardener, rebuilding putty reinforced with aluminum oxide and ceramics with a 100% solid content per volume. Approved

product: *DUROMAR SAR CERAMIC PUTTY*.

2. Intermediate: Two component, bisphenol A resin with a modified aliphatic polyamine hardener, lining reinforced with aluminum oxide and ceramics with a 100% solid content per volume. Approved product: *DUROMAR EAC CERAMIC LINING*.

3. Finish: UV stable polyaspartic coating system with an aliphatic isocyanate, zero VOC and 100% solid content per volume. Approved product: *DUROMAR 5610*.

I. System 9: Tanks bottom underside (shop applied):

1. Two component fast curing solvent based inorganic zinc rich ethyl silicate primer with a minimum 63% solid content per volume. Approved product: *INTERNATIONAL INTERZINC 22*.

J. System 10: Concrete Repair and Lining System for Concrete Surfaces with Exposure to Chemicals and Heavy Traffic.

1. Sealer: Multifunctional epoxy with modified cycloaliphatic amine hardener concrete sealer, 100% solid content per volume. Approved product: *DUROMAR HPL-1301*.

2. Rebuild Vertical and Horizontal Surfaces: Epoxy grout, 100% solid content per volume, mixed in a ratio of 60 lbs. of aggregate (30 lbs. of washed fine sand and 30 lbs. of ¼" pea gravel) per gallon of product for a concrete consistency. Only for heavy damaged areas and ultra-protection when specify. Approved product: *DUROMAR DUROFIL*.

3. Resurface Horizontal Surfaces: Two component epoxy novolac material, 100% solid content per volume, mixed in a ratio of 9.5 lbs. of sand per gallon of product. Approved product: *DUROMAR CHEMECRETE SUPER*.

4. Lining: Two component novolac epoxy with modified cycloaliphatic amine hardener, 100% solid content per volume. Approved product: *DUROMAR DF-4301*.

K. System 11: Concrete Repair and Lining System for Concrete Surfaces with Exposure to Chemicals.

1. Sealer: Multifunctional epoxy with modified cycloaliphatic amine hardener concrete sealer, 100% solid content per volume. Approved

product: *DUROMAR HPL-1301*.

2. Rebuild Vertical and Horizontal Surfaces: Epoxy grout, 100% solid content per volume, mixed in a ratio of 60 lbs. of aggregate (30 lbs. of washed fine sand and 30 lbs. of ¼" pea gravel) per gallon of product for a concrete consistency. Only for heavy damaged areas and ultra-protection when specify. Approved product: *DUROMAR DUROFIL*.

3. Lining: Two component multifunctional novolac epoxy with modified cycloaliphatic amine hardener and reinforced with flake glass, 100% solid content per volume. Approved product: *DUROMAR HPL-4310 FG*.

L. System 12: Internal Coating System for Condensate and Demineralized Water Tanks (100% field application). Contractor may choose any of the following options:

1. Base: Multi-functional novolac epoxy coating with a modified cycloaliphatic amine hardener and reinforced with glass flakes, 100% solids content per volume. A submerge maximum temperature of 300°F and a pH range from 0.5 to 14. Approved product: *DUROMAR HPL-4310 FG*.
Approved Alternate #1: *CHESTERTON-ARC S5*
Approved Alternate #2: *SHERWIN WILLIAMS NOVA-PLATE 325*

2. Finish: Multi-functional novolac epoxy coating with a modified cycloaliphatic amine hardener and reinforced with glass flakes, 100% solids content per volume. A submerge maximum temperature of 300°F and a pH range from 0.5 to 14. Approved product: *DUROMAR HPL-4310 FG*.
Approved Alternate #1: *CHESTERTON-ARC S5*
Approved Alternate #2: *SHERWIN WILLIAMS NOVA-PLATE 325*

M. System 13: Internal Coating System for Condensate and Demineralized Water Tanks (combination of shop and field application). GeneraPR will require and enforce a rigorous quality control and quality assurance for this system. Contractor shall submit a certification from the coating manufacturer establishing that all necessary repairs to the primer coat were

successfully completed after the tank fabrication. The base coat shall not be applied until GeneraPR formally received and approved such document. Contractor may choose any of the following options:

1. Shop Primer: Epoxy polyamine primer with fast drying and extended recoat ability and 72% solid content per volume. Approved product: *SHERWIN WILLIAMS MACROPOXY 240 (Gold)*.
2. Finish: Two component, modified novolac epoxy resin reacted with cycloaliphatic amine curing agent reinforced with ceramic and mineral particles, 100% solids content per volume. A submerge maximum temperature of 356°F and a wide pH range. Approved product: *CHESTERTON-ARC S5*.

Approved Alternate: *SHERWIN WILLIAMS NOVA-PLATE 325*.

PART 3 EXECUTION

3.1 PRELIMINARY

A. The product's manufacturer Technician will examine the substrate and the conditions under which the work will be made to verify that all requirements and conditions are met before application. The Technician is the sole responsible to certified in written that such required conditions are properly met to begin application.

B. All products shall be from the same manufacturer, including the cleaning thinner.

C. The use of thinner in the coating mix is prohibited. Thinner shall only be used as a cleaning agent.

D. Stripe coat shall be applied to all welds, edges, and corners with a minimum dry film thickness (dft) of 5 mils. This thickness shall not be considered as part of the coating system layers.

E. Coating application shall follow manufacturer recommendations and SSPCPA1 standard.

F. Contractor shall remove all weld spatter and slag to a smooth contour before abrasive surface preparation and coating.

G. All surface preparation and coating application shall be performed at the site. Shop primer shall be removed at the site.

H. Surface preparation shall be compared to photographic reference from SSPC-VIS 1 for steel, prepared with dry grit media blast.

I. In the case that the overcoat window expired, contractor shall apply a dry grit media blast to a SSPC-SP7 (Brush-Off Blast Cleaning) with the specified anchor profile followed by a surface cleaning with a 98% Alcohol.

3.2 PREPARATION

A. General Procedures: Remove or protect every accessory, plates, luminaries, or similar equipment not to be painted. All these equipment shall be reinstalled after completing the job.

B. Before abrasive cleaning, wet or dry, evaluate for the presence of oil or grease on the surface to be painted. Oil and grease shall be completely removed by Solvent Cleaning, SSPC-SP1 or recommended by the manufacturer. Use one of the following tests to detect the presence of oil or grease:

1. Water breaking: Use atomizes distilled water on the surface. The presence of oil or grease is detected when the water does not penetrate.
2. Clean Cloth: Slightly rug a clean white cloth over the surface. Discoloration on the cloth is evidence of grease or oil.

C. Surface preparation before painting/coating:

1. Surface Preparation 1: Working area shall be isolated. Dry abrasive grit blasting to white metal (SSPC-SP5) with a surface profile of 3 mils, for surfaces exposed to severe environment. For working areas inside GeneraPR's facilities, sponge jet technology can be used with the same requirements.
2. Surface Preparation 2: Working area shall be isolated. Dry abrasive grit blasting to near white (SSPC-SP10) with a surface profile of 2 mils, for surfaces exposed to severe environment. For working areas inside GeneraPR's facilities, sponge jet technology can be used with the same requirements.
3. Surface Preparation 3: Horizontal or vertical vacuum abrasive cleaning to commercial grade (SSPC-SP6) for steel surfaces exposed to severe environment. The abrasive cleaning profile is 3 mils.
4. Surface Preparation 4: Water pressurized (5,000psi) blast cleaning with inhibitors for surfaces exposed to severe environment. Areas

with localized corrosion or with loosed material shall be cleaned with a motor with vacuum cleaning attachments

5. Surface Preparation 5: Wet abrasive cleaning for surfaces exposed to severe environment. The abrasive cleaning profile is 2 mils.

6. Surface Preparation 6: Sodium bicarbonate cleaning using inhibitors in water, for surfaces exposed to severe environment. The abrasive cleaning profile is 2 mils.

7. Surface Preparation 7: For concrete substrates, medium shot-blast to ICRI CSP 4 or 5.

8. Surface Preparation 8: Working area shall be isolated. Dry abrasive grit blasting to brush-off (SSPC-SP7 / NACE No. 4) allowing for a great amount of the original coating to remain on the surface and to roughen the surface prior to applying the new coating system. For working areas inside GeneraPR's facilities, sponge jet technology can be used with the same requirements.

D. Water, residual material used for cleaning, residuals painting, scales, or loose material because of the surface preparation shall be recollected for a full RCRA characterization test.

1. Residual collector systems are Contractor's responsibility.

2. It is prohibited to store residual materials at tanks dikes areas.

E. Material Preparation: Mix and prepare the components following manufacturer's recommendations.

1. Keep clean and free of foreign materials the containments used for mixing and paint application.

2. Only use solvents and mixing agents of the same manufacturer.

3. Products diluted in excess are not allowed. The Contractor is the sole responsible on applying and ending with the specified thickness (dry). Engineer shall approve the required dry thickness applied.

F. Procedure for Testing and Removal of Soluble Salts (Chloride/Sulfate/Nitrate) – Not necessary when the surfaces are water jetted cleaned. The methodology shall be used for tank's interior.

1. All surfaces shall be water blasted cleaned with a minimum of 3,000 psi, using a 1% solution of Chlor Rid or similar product to remove soluble salts after abrasive cleaning and to prevent deformations on

the surface profile. The maximum chloride permissible contamination level in the water used for cleaning is limited to 100ppm.

2. The base coat (primer) can be applied if the surface is clean, free of dust, abrasive, and other contaminants. The following tests shall be done to guarantee the cleanness of the surface:

a. Adhesive tape testing every 1,000 ft ².

3. Chlor Test CSN, or similar product, shall be done one hour after abrasive cleaning. The test shall be done on representative areas with corrosion or loosed material, and closed to weld seams at shells, roof, and bottom.

4. Surfaces shall be tested for contaminants before any rehabilitation or surface preparation. Cleaning as described in the preceding items shall be repeated if contamination levels are founded to be greater than the followings:

a. Chlorides > 2 ppm (2 μg/cm2 or 20 mg/m2)
b. Sulfate > 3 ppm (3 μg/cm2 or 30 mg/m2)
c. Nitrate > 5 ppm (5 μg/cm2 or 50 mg/m2)

3.3 APLICATION

A. Apply the coating following manufacturer's instructions. Use suitable techniques and equipment for the material to be applied on the substrate. The airless spray method is preferable. The Contractor shall take all necessary measures to prevent the intrusion of any contaminant that may affect the painted area.

B. It is not permitted to paint over dirty, corroded, scaled, dusted, greased, unprepared surfaces.

C. Systems components shall be compatible, from the same manufacturer.

D. The film thickness remains the same independently on the method of application. Subsequent layers will not be applied until the previous layer has been cured, as indicated on the manufacturer's literature.

E. Apply additional layers when the previous layer is stained. All layers shall have the same uniform color and texture. Specified film thickness shall be verified on corners and edges. Special attention shall be given to assure that the corners, edges, hollows, and welds receives the same thickness of dry film as in flat surfaces.

F. Itinerary for Coating: First coat shall be applied as soon as possible after surface has been prepared. Repeat surface preparation process when there a change in color, loss of required surface profile or fast rusted.
G. Apply the minimum dry film thickness (dft) required per specified system. When is necessary and/or required by the Engineer, apply a spot primer at critical points before base (primer) coat. Specified coating thickness is not included in this step. Among the critical points are the edges, corners, and elbows.

1. System 1
    a. Primer – 4 mils
    b. Intermediate 1st Coat – 4 mils
    c. Intermediate 2nd Coat – 4 mils
    d. Finish 1st Coat – 4 mils
    e. Finish 2nd Coat – 4 mils
2. System 2
    a. Primer – 5 mils
    b. Intermediate – 5 mils
    c. Finish – 3 mils
3. System 3 – 20 mils
4. System 4
    a. Primer – 4 mils
    b. Finish 1st Coat – 8 mils
    c. Finish 2nd Coat – 8 mils
5. System 5
    a. Primer – 6 mils
    b. Finish 1st Coat – 20 mils
    c. Finish 2nd Coat – 12 mils
6. System 6
    a. Primer – 3 mils
    b. Finish 1st Coat – 20 mils
    c. Finish 2nd Coat – 20 mils
7. System 7
    a. Filler Coat – Lost substrate shall be replaced with this material to a smooth contour.

b. Base 1st Coat – 40 mils
c. Base 2nd Coat – 40 mils
d. Finish 1st Coat – 20 mils
e. Finish 2nd Coat – 20 mils

8. System 8
   a. Filler Coat – Lost substrate shall be replaced with this material to a smooth contour.
   b. Base 1st Coat – 40 mils
   c. Base 2nd Coat – 40 mils
   d. Intermediate 1st Coat – 20 mils
   e. Intermediate 2nd Coat – 20 mils
   f. Finish – 10 mils.
9. System 9 – 4 mils
10. System 10
   a. Sealer – Apply to a rate of 320 ft2 / gal (5 mils) using single or plural component airless spray equipment.
   b. Rebuild – Fill large voids in concrete to reshape surface or ½" for ultra-protection using a steel trowel or spreader bar.
   c. Resurface – Spread material to a leveled ¼" layer with a trowel or screed rake.
   d. Lining – 60 mils, applied in two layers of 30 mils each, with a single or plural component airless spray equipment.
11. System 11
   a. Sealer – Apply to a rate of 320 ft2 / gal (5 mils) using single or plural component airless spray equipment.
   b. Rebuild – Fill large voids in concrete to reshape surface or ½" for ultra-protection using a steel trowel or spreader bar.
   c. Lining – 80 mils, applied in two layers of 40 mils each, with a single or plural component airless spray equipment.
12. System 12
   a. Base – 20 mils
   b. Finish – 20 mils
13. System 13
   a. Primer – 3 mils

b. Finish 1st Coat – 20 mils
c. Finish 2nd Coat – 20 mils

3.4 QUALITY CONTROL

A. The GeneraPR reserve the right to request at any time, and many times as necessary, the following tests during the application:

1. The GeneraPR may contract the services of an independent laboratory to sample the products that are been used. The samples will be taken in the presence of the Contractor.
2. The laboratory will analyze the sample for the following characteristics per GeneraPR request:
    a. Material's Quantitative Analysis.
    b. Corrosion Resistance
    c. Apparent Reflectivity
    d. Flexibility
    e. Opacity
    f. Color Retention
    g. Rust and Alkaline Resistance
3. If the test results show that the material used does not comply with the requirements specified, the GeneraPR will stop the works and may require to the Contractor the disbursement of the testing, removal of the rejected paint, new surface preparation and new coating at his own cost.

B. The Contractor will provide to the Engineer the receipts of the materials purchased.

C. The Contractor shall keep a daily log of field conditions and of the necessary tests to assure the job is being done as specified and according to the manufacturer.

D. Quality control plan (by contractor except when noted) shall include but no limited to:

1. Nonvisible contaminants (salts/ions) test using SSPC Guide 15 Method A-2. The test shall be conducted every 500 ft2. Surfaces with the following concentrations shall be considered as CONTAMINATED:
    a. Chlorides > 2 ppm (2 μg/cm2 or 20 mg/m2)

b. Sulfate > 3 ppm (3 μg/cm2 or 30 mg/m2)
c. Nitrate > 5 ppm (5 μg/cm2 or 50 mg/m2)
This test shall be performed before surface preparation before primer coat and between each coating layer.
In the case that any level exceeds the maximum allowable, a water-CHLOR*RID 1:50 solution shall be used to pressurized (5,000 psi)blast cleaning the affected area.

2. If 8 hours or more have been elapsed without coating been applied or flash rust is present, contractor shall prepare the surface again at his own cost.
3. Surface profile test shall be performed with a digital gauge like Elcometer 224.
4. Tests shall be performed and recorded for ambient conditions such as temperature, relative humidity, and dew point.
5. Substrate surface temperature shall be checked and recorded before any coating application.
6. Every mixing procedure shall be documented with the mixing ration, mixing duration and dwell duration.
7. Wet film thickness shall be checked.
8. Dry film thickness test shall be performed with a digital meter like PosiTector 6000 in conformance with SSPC-PA2.
9. Adhesion test will be performed by with a Defelsko PosiTest AT-A automatic tester.
10. Holiday Test to 100% of the surface with a high voltage contact probe.
11. All the inspections and tests shall be performed in the presence of GeneraPR's inspector.

E. The Contractor shall keep accessible all the information related to the equipment used for inspections and tests, including equipment technical data and calibration.

F. The contractor shall prepare a quality control plan for GeneraPR's approval. The plan shall be signed by the quality control personnel.

G. Before any coating layer, contractor shall clean the surface to a grade of SSPC-SP1 using thinner for exterior surfaces and alcohol 98% for interior

surfaces.

H. Contractor shall be responsible to record keeping of all data and the spatial relationship to the structure.

I. All inspection equipment shall be calibrated and operated by certified personnel.

3.5 HOUSE KEEPING

A. Empty containers, covers, debris, residuals, and all unnecessary material in the working area shall be properly removed and disposed daily.

3.6 PROTECTION

A. Protect all equipment and completed work done in adjacent areas.

B. Damages shall be repaired, replaced, or recoated per Engineer's requirements.

3.7 SECURITY

A. Coatings/paintings shall be done following the safety measures recommended by the manufacturer and required by the Safety Engineer in charge. The Contractor shall always follow the best management practice plan (BMPP) and safety regulations established by the GeneraPR to assure a safe working environment to the personnel.

3.8 COLORS

A. Upon Contractor's formal request, GeneraPR shall select the colors for all the approved system coatings, including all the paint and primer components of the approved coating system.

END OF SECTION 09900

VI. **Cost Estimate**:

A) PSSP WTP Multimedia Filters: $ 1,000,000.00

B) PSSP Demineralized Tank 2: $ 2,450,000.00

C) Water Treatment Plant Chemical Pump System $500,00.00

Estimated cost for Project: $ 3,950,000.00

VII. Environmental & Historic Preservation ("EHP") Requirements

A. Other than design, planning and non-destructive due diligence studies, no construction work will commence prior to the issuance of specific expressed written FEMA approval for the specific scope of work. FEMA required EHP compliance review will precede the execution of each proposed scope of work submitted by PREPA through its agent Genera PR to FEMA. PREPA through its agent Genera PR is aware of its responsibility for coordinating, notifying, obtaining permits, and complying with applicable federal, state, and local laws, regulations, and executive orders and understands that failure to comply with EHP requirements will jeopardize FEMA funding.

B. See the following for general methods of repair and list of equipment to be used:

a. Dismantle & Salvage
- Complete testing for any containments or hazardous waste.
- All contaminated materials will be delivered to the approved waste disposal as per Disposal Management Plan.
- If equipment is to be salvaged, it will be loaded and removed from the site.
- All debris will be taken to the approved waste disposal facility as per the Waste Management Plan.

C. List of Equipment to be used but it is not limited to the following:
- Crawler Crane
- Semi-truck with low-bed trailer
- Man lift

D. Removal of vegetation
- N/A.

E. List the type of debris:
- Metal scrap, domestic waste, wood.
- The debris will be separated and taken to an approved waste disposal facility. Location permits and supporting documentation will be provided at closeout.

F. Description of Staging Area:
- N/A – only minor equipment staging near the existing equipment to be dismantled and installed.

G. Hazardous Material:

a. Describe the activity and the hazardous material involved. Calculate the quantity to be generated or disposed and include the management and disposal plan.
- The identified hazardous materials that can be found in the Generation Plant are asbestos, PCBs, Lead, SF6 gas, oil from the transformer & breakers. These hazardous materials, will be handled, and disposed of as per Federal and State Laws.
- GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations
- These products and their residues will be stored in special covered areas for disposal by an authorized company and provided with temporary spill controls until collected. All paint containers and curing compounds will be tightly sealed and stored when in use. Excess paint will not be discharged to the storm system, but properly disposed of, according to the manufacturer's instructions.
- Material amounts will be provided by a certified management contractor performing a site evaluation calculation for asbestos and lead paint.

- Prior to the start of any equipment dismantling activities, inspections for the presence of asbestos will be conducted by a trained and certified contractor.
- All asbestos waste found at the Generation Plant will be disposed of at an approved landfill designated by the Department of Environmental Health & Safety. All asbestos waste generated will be bagged and transported in accordance with all applicable State and Federal regulations. There will be no exceptions.
- Any asbestos spills will be cleaned up immediately to prevent the dispersal of fibers. Prudence will be exercised to avoid contamination of laboratory facilities or exposure of personnel to asbestos. Asbestos spills will be cleaned up with wet methods and/or a High-Efficiency Particulate-Air (HEPA) filtered vacuum.

b. If the project includes building demolition with asbestos, provide a copy of the EQB approved plan or evidence of plan submission.

- Not Applicable.

c. If the project includes disposal of damaged transformers or wood poles with creosote, include the management and disposal plan. The plan must include the final disposition site.

- Transformers and pole disposal will be handled as per the Waste Disposal Management Plan. GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
- The removal of the transformer will require testing of the existing oil for PCB's levels, drain oil, and delivery to the approved waste disposal site as per Environmental Regulations.
- Removal of wood poles with creosote treatment will be handled according to the Federal and State Laws.

H. Water Crossings:

a. Specify if the project will affect a waterway or body of water.

- Not Applicable

b. Modification of a body of water or wetland: Does the project require dredging, excavation, disposal of material, adding fill material that

might result in any modification of a body of water or wetland designated as "waters of the U.S."?

- Not Applicable

c. Does the project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?

- Not Applicable

d. Flood zone: Is the project located in a flood zone, floodway or will it have a negative impact on the flood zone?

- The Generation Plant is in Flood Zone A (SFHA per ABFE). Equipment replacement only. No negative impact.
- In accordance with the updated version of FEMA Region II Memorandum, dated October 10, 2017, Guidance for the use of Available Flood Hazard Information for the Government of Puerto Rico in complying with FEMA Policy 104-008-2, 44 CFR Part 9, and Executive Order 11988 (Floodplain Management). All hazard mitigation proposals under alternative procedures must be designed using the best available flood hazard data and in compliance with applicable regulations and policy.

U.S. Fish and Wildlife Service
National Wetlands Inventory

Wetlands

October 12, 2024

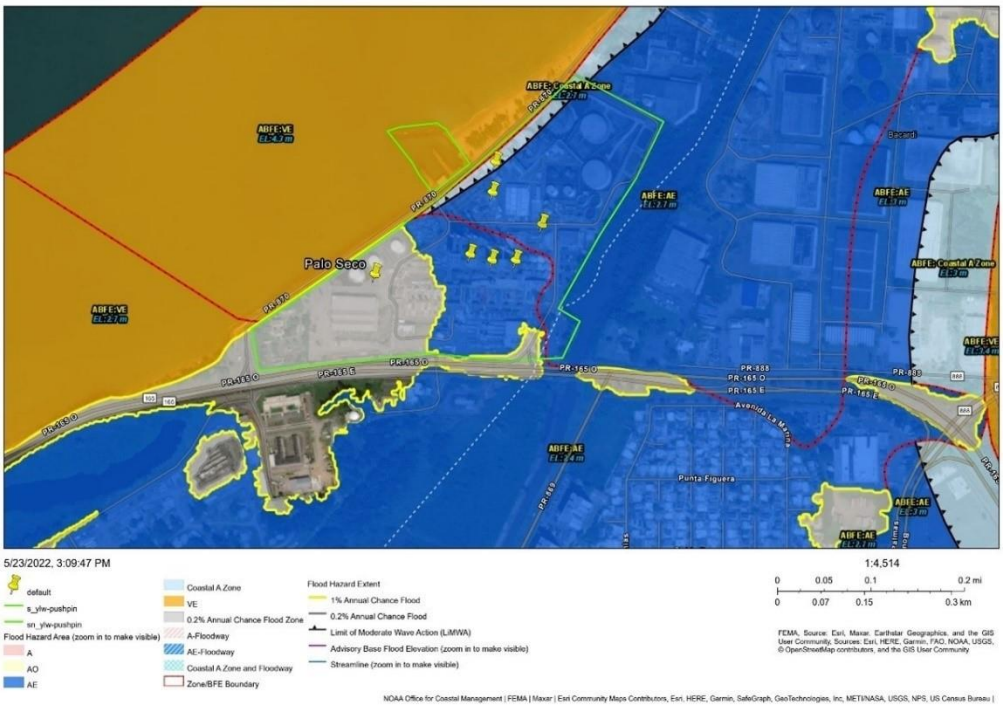
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Floodplains



I. Structure Age:
   a. Provide the construction date of any buildings or structures within the project. Include those near the project.
      - Not Applicable.

b. Provide date and information of any prior repairs, remodeling and/or rehabilitation of the property. Include current and previous use of building or structure.
   - Not Applicable.

c. If a building includes both older and newer sections, confirm which section of the building the work is being done.
   - Not Applicable

d. Include plans, drawings, blueprints, any architectural documentation available for new construction or substantial improvements regardless of the age of the building or structure.

- Not Applicable

e. Provide at least five color pictures of every structure or building, showing the four facades and the contextual view. Include additional pictures of architectural details. Also provide pictures of buildings (45 years old or older) on the proximities.
   - Not Applicable.

f. Provide an aerial photo map with the GPS coordinates of each structure.
   - Not Applicable.

J. Ground Disturbance

a. Provide a description of the new ground disturbance by giving the dimensions (area, depth, volume, etc.), if any. Include an aerial photo map showing the extent of the disturbance with coordinates.
   - Not Applicable.

b. The project SOW will not affect water or sewer utility services.

c. Indicate the prior/current use of the area to be impacted.
   - Not Applicable. Area is an existing Generation Plant. 100% of the work to be completed will be within the existing and already impacted Generation Plant perimeter.

d. Explain how materials will be stockpiled and disposed of.
   - Not Applicable.
   - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.

e. Specify final disposition site.
   - The disposal of materials will be handled as per the Waste Management Plan.

K. Soil Stabilization measures:

a. Does the project involve any soil stabilization measures?
   - No

L. Required Permits

List of the permits needed for Costa Sur Site:

- Environmental Compliance Determination in Oficina de Gerencia de Permisos (OGPe)
- General Consolidate Permit – OGPe
- Genera will provide proof of all permits as a Condition of FEMA Record of Environmental Considerations

I. Overview

New Damage: FAASt Costa Sur Power Plant Permanent Unit 5 Cooling Towers Repairs

Damage: #1229685; FAASt Costa Sur Power Plant Permanent Repairs Inner Barrel Bundle] (Bifurcates tubes)

Project Location: PR-127 Km 15.7, Tallaboa Ward, Guayanilla, Puerto Rico 00656

Latitude/Longitude: 18.001478, -66.751438

II. Objective

The primary purpose of this amendment is to submit changes in the Intended Scope of Work in accordance with FEMA requirements and guidance for Section 428. This initiative aims to provide comprehensive details of the work to be performed to restore the Costa Sur Steam Plant facility to its pre-disaster conditions. The amendment outlines the specific modifications needed to align the project with FEMA's regulatory framework, ensuring compliance with all relevant standards and protocols. It includes a detailed breakdown of the tasks required, such as structural repairs, equipment replacement, and system upgrades, all designed to enhance the plant's resilience and operational efficiency. Additionally, the amendment addresses the financial aspects, providing a revised budget that reflects the necessary adjustments to meet FEMA's funding criteria. By adhering to these guidelines, the project aims to secure the necessary support and resources to effectively rehabilitate the Costa Sur Steam Plant, thereby restoring its full functionality and service capacity.

III. Introduction

PREPA is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns the power plants for

electric generation, transmission, and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 3.4 million people. Genera-PR is the operator authorized under a Public-Private Partnership agreement of the thermal generation facilities of Puerto Rico. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair, replacement and improvement. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements.

On September 6, 2017, Puerto Rico's northern coastline was struck by Hurricane Irma, a Category 4 storm. Two weeks later, on September 17, Hurricane Maria tore through the island of Puerto Rico as a Category 5 storm. Subjected to 150+ mph winds and more than 25 inches of rain, 3.4 million residents lost power and a great deal of infrastructure, including critical facilities, was damaged. In particular, the electrical infrastructure suffered catastrophic impacts. In the aftermath, diligent recovery and reconstruction have been going on, not only to restore the electrical infrastructure to pre-storm function and capacity, but to take this opportunity to bring it in line with current standards and technology. With the recovery funding available, "*Everyone can be sure that we are working responsibly to achieve efficiencies, reduce costs, decommission inefficient and polluting plants, and continue to transform our electrical system for the benefit of our economy and our people*" as Governor Pedro Pierluisi said, this being an opportunity to not just to rebuild the system but to transform it into a smarter, more resilient, and cleaner one. Puerto Rico's generation system must meet customer demand and have adequate additional capacity to comply with the reserve required by the standard operating procedures of the T&D system operator (LUMA). In terms of service continuity, the system must be reliable so that service interruptions are within the margins established in the electrical industry standards.

In 2020 the situation became more complicated when earthquakes events 4473DR-PR provoked more damages to Costa Sur Power Plant. Later, in September 2022, Hurricane Fiona 4671DR-PR also impacted Puerto Rico, destroying even more the already fragile generation assets. Unfortunately, the generation

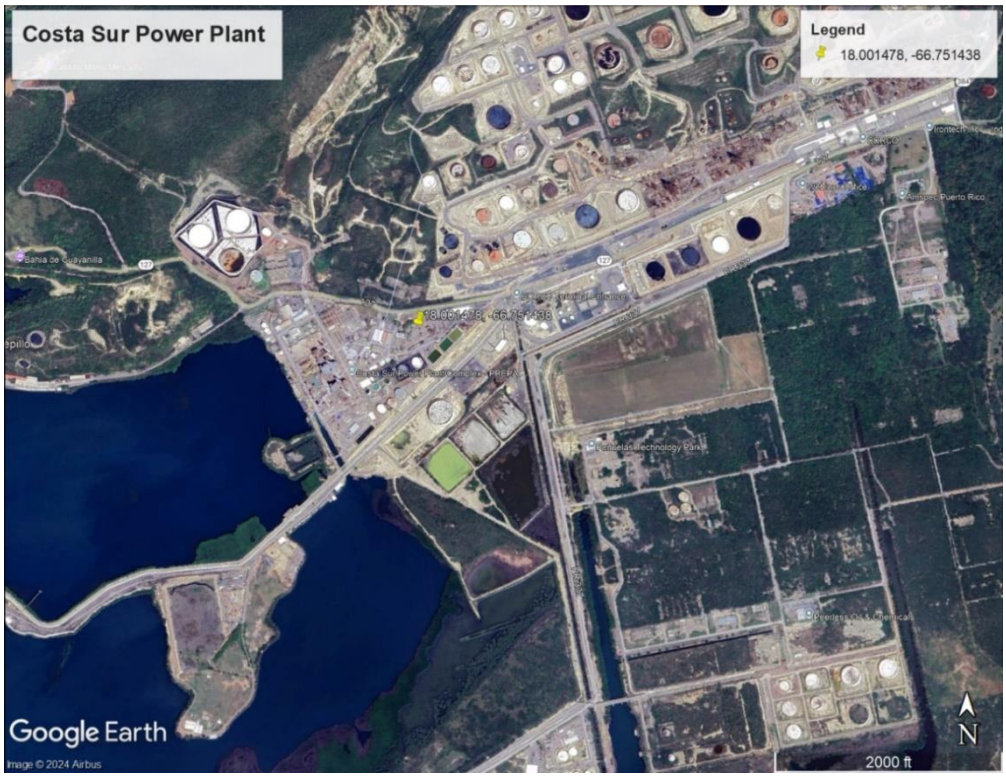
system presents critical performance metrics with a deficiency in capacity to meet the energy demand and the minimum reserve requirements. The forced outage percentage of the units is increasing while the generation capacity decreases. This combination of factors puts the continuity of the service at high risk, adversely affecting the quality of life of those who live in PR.

Genera is responsible for operating and maintaining PREPA's legacy asset generation fleet pursuant to the Generation O&M Agreement. The current fleet condition presents poor performance due to the impact of hurricanes María and Fiona. Generation capacity has been reduced to 46% of installed capacity. In addition, of the generation units in operation, about 32% or 640 MW, are disconnected monthly, causing thousands of customers to suffer interruptions in their service.

The Puerto Rico Electric Power Authority ("PREPA") is a public corporation of the Government of Puerto Rico created pursuant to Act No. 83 of May 2, 1941, as amended. PREPA owns and operates electric generation, transmission and distribution facilities serving all of Puerto Rico. As the sole electric utility in Puerto Rico, PREPA provides electricity to approximately 1.5 million customers. Since 2017, PREPA has performed damage assessments, studies, and evaluations to identify areas of repair and improvements. These include transmission and distribution lines, electrical substations, generation plants, mitigation, and other improvements. On January 2023, PREPA and the Puerto Rico Public-Private Partnership Authority ("P3 Authority") selected Genera PR, LLC ("Genera") to operate, maintain and modernize the Generation system of PREPA for ten years through a public-private partnership.

To enhance the system's reliability, Genera proposes to submit for approval the detailed Intended Scope of Work (SOW) to COR3 and FEMA for the Project 672950 under DR-4339-PR Public Assistance. The document provides a description of the project including scope, schedule, and cost estimates as well as Environmental & Historical Preservation ("EHP") requirements.

Figure 1: Facility Location



IV. Facility Description

PREPA's Generation System Maintenance Program was developed and is being executed using the industry standards, following the equipment's manufacturer maintenance recommendations and PREPA policies. Periodical inspections, tests are performed to identify critical component repairs/replacement in equipment such as boilers, turbines, generators, power transformers, cooling towers, circuit breakers, protection and control relays, grounding mats, and auxiliary equipment.

Genera PR proposes to perform necessary repair and/or replacement of critical generation components pursuant to the Generation O&M Agreement between PREPA, the P3 Authority, and Genera PR.

Costa Sur, located on the southern coast of Puerto Rico in Guayanilla, is owned by PREPA and operated by Genera. The site encompasses approximately 990 acres, with the project itself covering 0.26 acres (76,423 square feet). The plant features two operational steam power generation units with a combined nameplate capacity of 820 megawatts (MW). The site also includes two 21-MW black start capable gas turbine generators, designated as GT #1.1 and GT #1.2.

V. Codes and Standards

The following will be referenced when applying specific codes, specifications, and standards to the project design:

- Consensus-based codes, per FEMA (Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR, February 2020.
- Industry standards per FEMA Recovery Policy FP-104-009-5, Version 2, Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.
- FEMA Recovery Interim Policy FP-104-009-11 Version 2.1, Consensus-Based Codes, Specifications, and Standards for Public Assistance.
- Rus 1730B - The referenced standards, as defined and as per their requirements, state every system is required to have an Emergency Restoration Plan (ERP) in the event of a major failure or storm event.

VI. Project Description - Cooling Towers Repair Works

The Steam Plant Unit 5 and 6 Cooling Towers are part of the cooling system for a steam power plant, specifically designed to dissipate excess heat generated during the power production process is located in 18.000004, -66.7545. These cooling towers use a combination of evaporation and air convection to remove heat from the plant's condenser water, which has absorbed heat from the

steam used to drive the turbines. This process helps maintain the efficiency and safety of the power plant by ensuring that the equipment does not overheat.

Steam Units 5 and 6, each rated at 410 MW, began commercial operation in 1972 and 1973, respectively. Their tangentially fired CE boilers were retrofitted in 2011 to burn natural gas, while retaining the flexibility to burn either a combination of natural gas and heavy fuel oil (HFO) or HFO only, as originally designed. When fired with natural gas, these units can achieve their original maximum continuous rating (MCR) design conditions: 2,970 kilo pounds per hour (klb/hr) main steam flow, with outlet steam conditions of 2,620 psig and 1,005°F. The boilers also feature a reheat circuit designed to provide 2,371 klb/hr steam flow at 451 psig and 1,000°F to the intermediate pressure (IP) section of the GE turbines, maintaining the rated output of 410 MW. For more details regarding location, please refer to Figure 2 below.

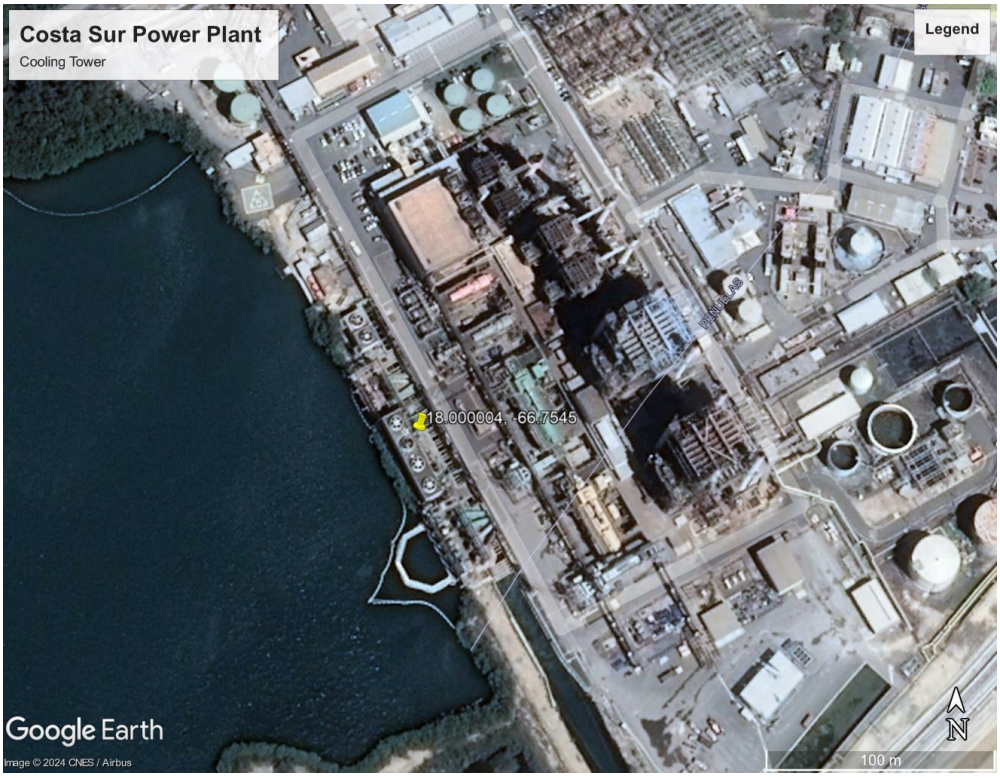


Figure 2: Cooling Tower of Unit 5 Location

Initial Scope of Work

Genera on behalf of PREPA is proposing the rehabilitation of Costa Sur Steam Plant Unit 5 and 6 Cooling Towers involves a comprehensive Intended Scope of Work, including the replacement of drift eliminators, fill material, PVC lateral piping and nozzles, air inlet louvers, damaged exterior casing panels, corner rolls perimeter seals, and structural support elements. The contractor must complete and commission one cell at a time, ensuring all work is done in strict accordance with the specifications. Additionally, all contacts between dissimilar metals must be isolated to prevent galvanic corrosion. Genera will verify the completeness of the work, and the contractor must keep Genera representative informed of progress and any immediate corrective actions required.

General Requirements

A. All work shall be carried out and complete on a continuous schedule of one hundred (100) days. The Contractor shall consider more than one working period to execute the project 24 hours-7 days a week.

B. The Contractor shall submit to Genera project Management weekly summary reports for the works stating the actual status, rate of progress, estimated time of completion and cause of delays, if any, including the schedule update.

C. Throughout the project, a written report detailing the conditions as found, the work performed, clearances, and recorded test data should be submitted. A final report must be provided within seven (7) days after all work is completed.

D. The Contractor is responsible to open and close all necessary accesses to perform the works detailed in the Intended Scope of Work, including removal and sidings.

E. The contractor shall implement the Foreign Material Entry (FME) Prevention Program. The requirements for this program are the following:

a. Access Control - The requirements for ingress and egress from the designed area. At this point, the people are requiring removing jewelry and all contents of pockets and leaving these things with the designed FME clerk or at the assigned area.

b. Tool Control- The method used to assure that tools are individually marked from other like items, identified to the user or worker and storage location, and inventoried at the beginning and end of each task or shift.

c. Clean As You Go - The practice of cleaning assigned tools, parts equipment, work site, etc., during and at end of assigned task or shift, to promote work safety.

These specifications cover the work required under the Contract for the rehabilitation of Costa Sur Steam Plant Unit 5 Cooling Towers. The contractor shall complete and commission one cell at a time. The extent and general scope of the works in strict accordance with these specifications are as follows:

A. Replacement of all drift eliminators on the two cells:
    1. Removal and disposal of the existing drift eliminators.
    2. Install the new drift eliminators as specified by the manufacturer.
    3. Install perimeter new seals tower.
    4. Install new structural dry seal.
    5. Install new 316 stainless steel hardware.
        a. Bolts, nuts, and screws

b. Washers
c. Anchors and brace straps
d. Structural support
e. Louvers and rods

6. Re-use all existing drift eliminators supports.

B. Replacement of all the fill material on the two cells:
   1. Removal and disposal of the existing fill material.
   2. Install new fill material.
   3. Install perimeter seals.
   4. Re-use existing fill material supports.

C. Replacement of the existing 4" diam. PVC lateral piping and nozzles on the two cells:
   1. Removal and disposal of the existing pvc laterals and nozzles.
   2. Install new laterals piping and down spray nozzles.

D. Replacement of all the existing air inlet louvers:
   1. Removal and disposal of the existing air inlet louvers.
   2. Install new air inlet louvers.

E. Replacement of damaged exterior casing panels:
   1. Removal and disposal of casing panels.
   2. Install new corrugated, fire retardant, FRP casing panels.
   3. For the installation, use 316 stainless steel hardware and caulking.
      a. Bolts, nuts, and screws
      b. Washers
      c. Anchors and brace straps
      d. Structural support
      e. Louvers and rods

F. Replacement of Corner Rolls Perimeter Seals:
    1. Removal and disposal of corner rolls.
    2. Install new FRP corner rolls perimeter seals.

G. Replacement of structural support elements of the cooling tower.
    1. Removal of existing structural elements. Contractor shall dispose the existing elements in PREPA's containers.
    2. Installation of new structural elements.

H. Every contact between dissimilar metals shall be isolated to avoid galvanic corrosion.

I. PREPA will verify completeness of the work required. After the site work is concluded and before authorizing demobilization of the contractor, a meeting to report all findings and results of the project shall be performed by the contractor with Genera representative.

J. While on site, the contractor must keep Genera representative informed, regarding the progress of work. Furthermore, Genera shall be notified immediately by the contractor about any finding that requires immediate corrective action.

Contract Provisions

To be Furnished by Contractor

A. All applicable municipal and state taxes, bonds and insurances.
B. COVID-19 Protocol and evidence of self-certification filled to the government agency with jurisdiction.

C. The Contractor shall also furnish all accessories, services and appurtenances as called for on the specifications or which he deems necessary to make a complete and well-integrated installation within the scope of this specification.
D. Scaffolding
E. Demolishing and cleaning equipment for the existing fill-membranes impregnated with hardened calcium material. Also, trucks and permitting for the disposal of material in an Industrial Landfill accepted by PREPA.
F. Dumpsters for the materials product of the repairs and its disposal.
G. Any lifting equipment needed for the job (forklift, crane, etc.)
H. Field office facilities for Contractor's personnel.
I. Sanitary and first aid facilities for his personnel.
J. Personal Protection Equipment, such as helmets, welders' jackets, goggles, gloves, etc.
K. Adequate and proper identification of Contractor's personnel.
L. The Contractor shall furnish materials and accessories, and expendable materials like cleaning agents, solvents, thread and gasket compounds, greases, wiping cloths, blasting materials, welding rod, drinking cups, ice, paper towels, toilet paper, etc.
M. Adequate field facilities and vigilance to keep all materials, tools, equipment and spares safe.
N. Changing facilities for the personnel.
O. Adequate and proper identification of Contractor's personnel.
P. All other resources or activities needed for performing the job, not furnished by PREPA, according to the Intended Scope of Work.

To be Furnished by Genera

A. All parts and materials required for the refurbishment of both cooling towers.
B. Water and electric power 120- and 220-volts single phase facilities for tools and construction work.
C. A supervisor for local inspection and management of project.
D. Container and disposal of metal scrap material.

--------END OF TECHNICAL SPECIFICATIONS AND INTENDED SCOPE OF WORK----------

VII. Cost Estimate: $850,000.00

VIII. Damage: 1229685

Project Description - Inner Barrel Assembly Boiler Feed Water Pumps (Bifurcates tubes)

The Intended Scope of Work is provided as guidelines to establish the minimum requirements for the manufacture and delivery of a new inner barrel assembly for Unit 5 of the Costa Sur Steam Plant located in 18.00031, -66.75376.

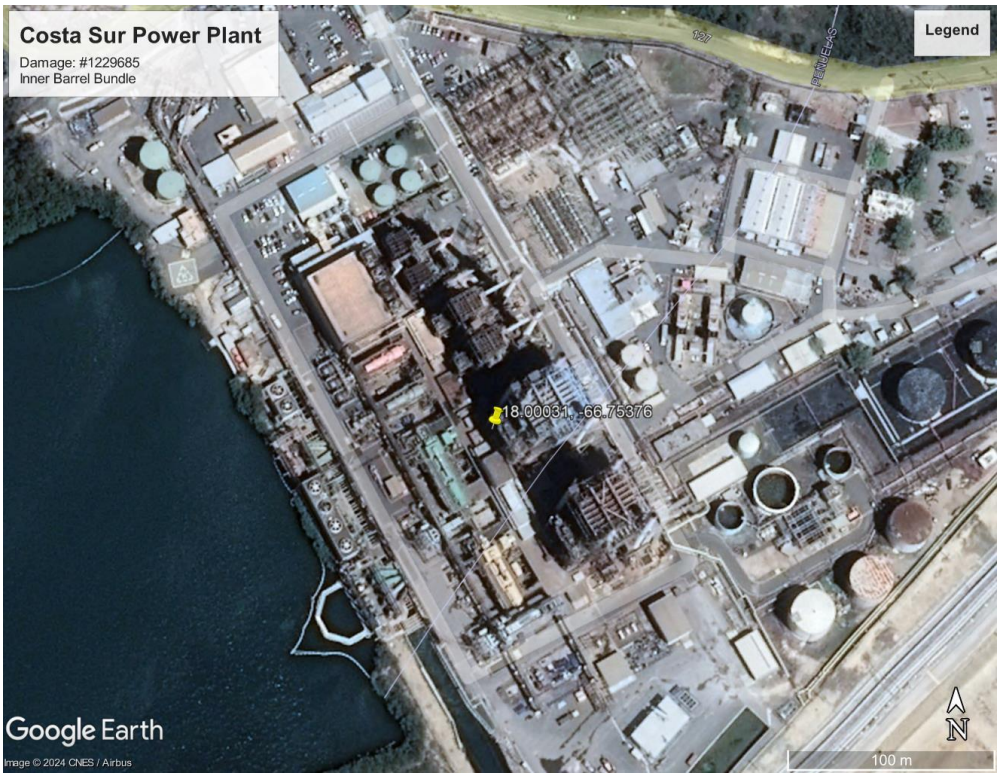


Figure 3: Inner Barrel Location

Initial Scope of Work

These guidelines establish the minimum requirements for the manufacture and delivery of a new inner barrel assembly for Unit 5 of the Costa Sur Steam Plant for DI 1229673. This document outlines the critical specifications and standards that must be adhered to, ensuring that the new inner barrel assemblies meet the operational and safety requirements of the steam plant. The scope includes detailed engineering design, material selection, fabrication processes, quality

control measures, and testing protocols. It also covers the logistics of delivery, including packaging, transportation, and handling to ensure the assemblies arrive in optimal condition. Furthermore, the guidelines emphasize the importance of compliance with industry standards and regulatory requirements, as well as the need for thorough documentation and certification of all manufacturing and delivery processes. By providing these detailed requirements, the guidelines aim to facilitate a seamless integration of the new inner barrel assemblies into the existing infrastructure, thereby enhancing the reliability and efficiency of the steam plants' operations.

A. Manufacture of One Set of Bifurcate Tubes: Contractor shall comply with the following technical requirements:
    i. Lower Drum Tubes with Side Wall Bifurcates
    ii. Tubes to be supplied 1" longer at the original drum nipple weld up to 25'-8" at the center, 20 tubes on the side wall and 22'-7" on the remaining 40.
    iii. Tubes being supplied are the first 15 tubes of the side counting from center of the wall, this will be 30 tubes toward the front and 30 tubes tower the rear from the centerline on both side wall.
    iv. Provide 30 bifurcated tubes per sidewall.
    v. Third leg on the bifurcates is 2.250-240-210A1, bifurcated legs to be 2.000-240-210A1 tube ends to be prepped for field welding tube ends will be coated with DEOX, capped and taped. Bifurcate welds will be 100% MT or PT'D.
    vi. 10% of the shop butt welds will be x-rayed bifurcates to be shop Hydro' D.
    vii. Mark Numbers Provided as 2 Each: LS-40L/R, 41L/R, 42L/R, 43L/R, 44L/R, 45, L/R, 46L/R, 47L/R, 48L/R, 49L/R, 50L/R, 51L/R, 52L/R, 53L/R AND 54L/R.

B. Transportation

i. Contractor shall provide the transportation and any required permits and taxes to deliver the bifurcate tubes from the workshop to the Costa Sur Steam Plant site.

C. Documentation and Certifications

i. Certificate of Compliance: Contractor shall present the following documentation:

1. Stamp S
2. Drawings
3. Mill Test Reports
4. Hydrostatic Pressure Test

ii. Schedule

Before beginning any work on any of the components, Contractor shall develop a schedule of activities in connection with the work of the Contract and submit it for the approval of the PREPA. All work shall be carried out on a continuous schedule following the date established by PREPA and Contractor.

--------END OF TECHNICAL SPECIFICATIONS AND INTENDED SCOPE OF WORK----------

IX. Cost Estimate: $455,000.00

X. Environmental & Historic Preservation ("EHP") Requirements

Other than design, planning and non-destructive due diligence studies, no construction work will commence prior to the issuance of specific expressed written FEMA approval for the specific Intended Scope of Work. FEMA required EHP compliance review will precede the execution of each proposed Intended Scope of Work submitted by PREPA through its agent Genera PR to FEMA. PREPA through

its agent Genera PR is aware of its responsibility for coordinating, notifying, obtaining permits, and complying with applicable federal, state, and local laws, regulations, and executive orders and understands that failure to comply with EHP requirements will jeopardize FEMA funding.

A. See the following for general methods of repair and list of equipment to be used:

    a. Dismantle & Salvage
        - Complete testing for any containments or hazardous waste.
        - All contaminated materials will be delivered to the approved waste disposal as per the Federal and state laws ~~Disposal Management Plan~~.
        - If the equipment is going to be salvaged, it will be loaded and removed from the site.
        - All debris will be taken to the approved waste disposal facility as per the Federal and state laws ~~Waste Management Plan~~.

B. List of Equipment to be used but it is not limited to the following:
    - Crawler Crane
    - Semi-truck with low-bed trailer
    - Articulated Boom Lifts
    - Man Lift

C. Removal of vegetation
    - N/A.

D. List the type of debris:
    i. Metal scrap, domestic waste, wood.
    ii. The debris will be separated and taken to an approved waste disposal facility. Location permits

and supporting documentation will be provided at closeout.

E. Description of Staging Area:
   - N/A – only minor equipment staging near the existing equipment to be dismantled and installed.

F. Hazardous Material:
   a. Describe the activity and the hazardous material involved. Calculate the quantity to be generated or disposed and include the management and disposal plan.
      - The identified hazardous materials that can be found in the Generation Plant are asbestos, PCBs, Lead, SF6 gas, oil from the transformer & breakers. These hazardous materials will be handled, and disposed of as per Federal and State Laws.
      - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
      - These products and their residues will be stored in special covered areas for disposal by an authorized company and provided with temporary spill controls until collected. All paint containers and curing compounds will be tightly sealed and stored when in use. Excess paint will not be discharged to the storm system, but properly disposed of, according to the manufacturer's instructions.
      - Material amounts will be provided by a certified management contractor performing a site evaluation calculation for asbestos and lead paint.
      - Prior to the start of any equipment dismantling activities, inspections for the presence of asbestos will be conducted by a trained and certified contractor.
      - All asbestos waste found at the Generation Plant will be disposed of at an approved landfill designated by the

Department of Environmental Health & Safety. All asbestos waste generated will be bagged and transported in accordance with all applicable State and Federal regulations. There will be no exceptions.

- Any asbestos spills will be cleaned up immediately to prevent the dispersal of fibers. Prudence will be exercised to avoid contamination of laboratory facilities or exposure of personnel to asbestos. Asbestos spills will be cleaned up with wet methods and/or a High-Efficiency Particulate-Air (HEPA) filtered vacuum.

b. If the project includes building demolition with asbestos, provide a copy of the EQB approved plan or evidence of plan submission.

- Not Applicable.

c. If the project includes disposal of damaged transformers or wood poles with creosote, include the management and disposal plan. The plan must include the final disposition site.

- Transformers and pole disposal will be handled as per the Waste Disposal Management Plan. GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
- The removal of the transformer will require testing of the existing oil for PCB's levels, drain oil, and delivery to the approved waste disposal site as per Environmental Regulations.
- Removal of wood poles with creosote treatment will be handled according to the Federal and State Laws.

G. Water Crossings:

a. Specify if the project will affect a waterway or body of water.

- Applicable – DI XXXXX, Cooling Tower is located in the shore of the bay.

b. Modification of a body of water or wetland: Does the project require dredging, excavation, disposal of material, adding fill material that might result in any modification of a body of water or wetland designated as "waters of the U.S."?

- Not Applicable

c. Does the project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?

- Not Applicable

d. Flood zone: Is the project located in a flood zone, floodway or will it have a negative impact on the flood zone?

- The Generation Plant is in Flood Zone A (SFHA per ABFE). Equipment replacement only. No negative impact.
- In accordance with the updated version of FEMA Region II Memorandum, dated October 10, 2017, Guidance for the use of Available Flood Hazard Information for the Government of Puerto Rico in complying with FEMA Policy 104-008-2, 44 CFR Part 9, and Executive Order 11988 (Floodplain Management). All hazard mitigation proposals under alternative procedures must be designed using the best available flood hazard data and in compliance with applicable regulations and policy.

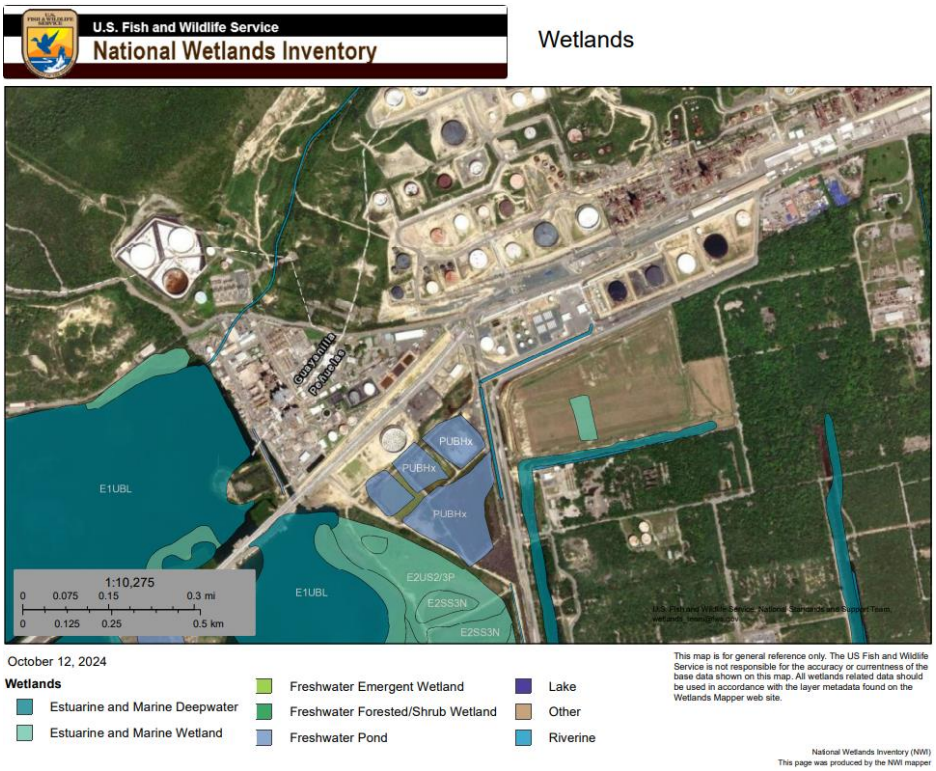


Figure 4: US Fish and Wildlife, Wetlands Map

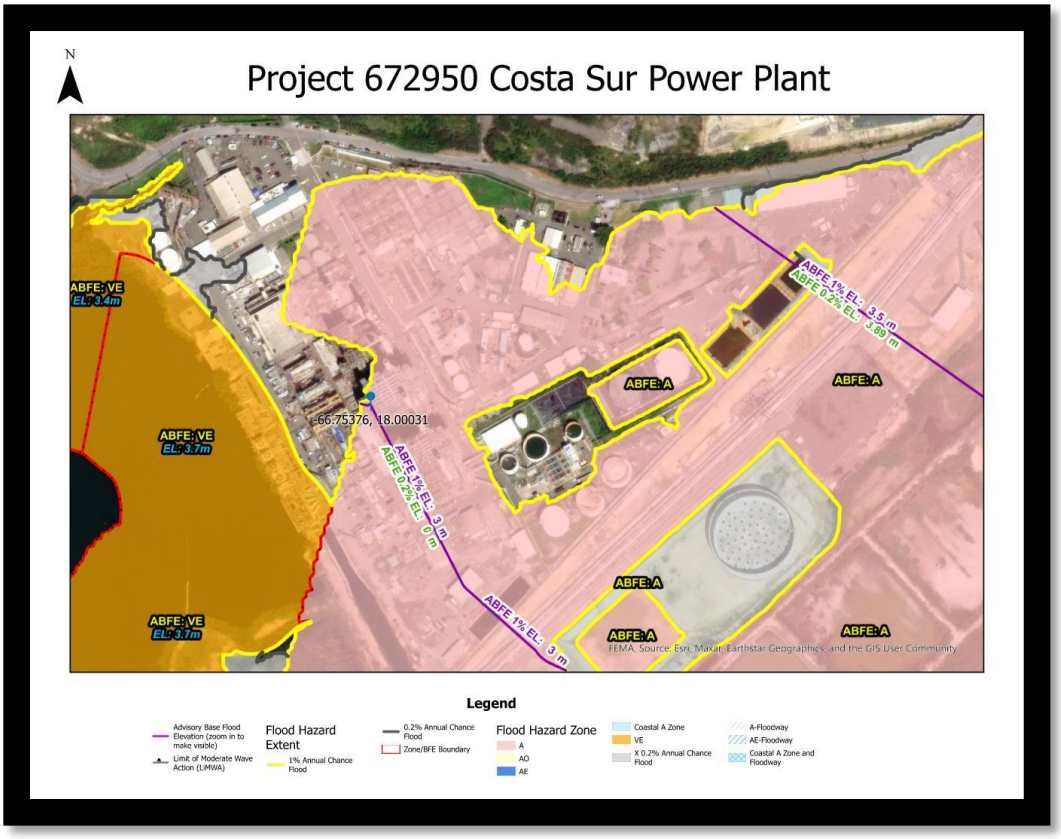


Figure 5: ABFE Flood Map

H. Structure Age:

a. Provide the construction date of any buildings or structures within the project. Include those near the project.

- Not Applicable.

b. Provide date and information of any prior repairs, remodeling and/or re-habilitation of the property. Include current and previous use of building or structure.

- Not Applicable.

c. If a building includes both older and newer sections, confirm which section of the building the work is being done.

- Not Applicable

d. Include plans, drawings, blueprints, any architectural documentation available for new construction or substantial improvements regardless of the age of the building or structure.
    - Not Applicable
e. Provide at least five color pictures of every structure or building, showing the four facades and the contextual view. Include additional pictures of architectural details. Also provide pictures of buildings (45 years old or older) on the proximities.
    - Not Applicable.
f. Provide an aerial photo map with the GPS coordinates of each structure.
    - Not Applicable.

I. Ground Disturbance
a. Provide a description of the new ground disturbance by giving the dimensions (area, depth, volume, etc.), if any. Include an aerial photo map showing the extent of the disturbance with coordinates.
    - Not Applicable.

b. The project SOW will not affect water or sewer utility services.
c. Indicate the prior/current use of the area to be impacted.
    - Not Applicable. Area is an existing Generation Plant. 100% of the work to be completed will be within the existing and already impacted Generation Plant perimeter.

d. Explain how materials will be stockpiled and disposed of.
    - Not Applicable.
    - GENERA will provide actual disposal locations and quantities as a Condition of FEMA Record of Environmental Considerations.
e. Specify final disposition site.
    - The disposal of materials will be handled according to Federal and State Laws.

J. Soil Stabilization measures:
a. Does the project involve any soil stabilization measures?
    - No

K. Required Permits

List of the permits needed for Costa Sur Site:

- Environmental Compliance Determination in Oficina de Gerencia de Permisos (OGPe)
- General Consolidate Permit – OGPe
- Genera will provide proof of all permits as a Condition of FEMA Record of Environmental Considerations.

Exhibit B

No.	Plant	Description NME	Project #
4	CS	Repair Cooling Tower Unit	672950
5	CS	Manufacture and Delivery of Bifurcate [Boiler) Tubes Unit 5	672950
8	SJ	HRSG Hot Spots Mitigation U6	662947
9	SJ	Safety Valves Rehabilitation and Certification U5-6	662947
12	SJ	Water Treatment plant Nautilus Rank #1 and #2 Rehabilitation & Repair	667744
15	PS	WTP Acid & Soda Pumps Replacement	671481
16	PS	Unit #4 Economizer Water Inlet Valve	662957
18	PS	New Demi Water Tank#2	671481
19	PS	Replacement Multi-Media Filters WTP	671481
22	Ag S	HP & IP Rotors Rehabilitation & Trip Block & H2 seals replacement U2	669233
24	Ag S	Generator Spare Rotor Rewind	669233
25	Ag S	Structural Rehabilitation Nautilus Water Tank, Water Treatment Plant	669498
29	Ag CC	Major Inspection of Units GT 2-3	669815
30	Ag CC	HGPI 1-4	669815
31	Ag CC	Relocate Transformer	669815
33	Ag CC	Gas Turbine Rotor Refurbish MS7001B/AE	669815
36	Ag S	Manufacture and Delivery BFWP 5,000 HP Motor	669498
38	M	Repair & Replacement Combustor Components Unit 2B	663385
39	M	Hot Section Inspection Unit 4A	663385
42	M	Repair and Replace Combustors Components Unit 3A	663385
49	C	Structural Rehabilitation Fuel #2	663383
59	PS	Unit #4, Major Repair	662957
60	Ag CC	New Water Condensate Tank No. 2	669815