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 to Submit Scope of Work for IT-OT System Upgrades

MOTION TO SUBMIT SCOPE OF WORK FOR IT-OT SYSTEM UPGRADES

COMES NOW the Puerto Rico Electric Power Authority (PREPA), through its counsel of record, and respectfully submits and requests as follows:

1. On March 26, 2021, the Energy Bureau of the Puerto Rico Public Service Regulatory Board (the "Energy Bureau") entered a *Resolution and Order* (the "March 26 Order") requiring PREPA to, among other things:

> submit to the Energy Bureau each new capital investment project. For projects to be funded with the [Federal Emergency Management Administration "FEMA"] fund and/or any other federal funds, PREPA shall submit the specific projects to the Energy Bureau at least thirty (30) calendar days prior to its submittal to the [Central Office for Recovery, Reconstruction and Resiliency "COR3"], FEMA and/or any other federal agency.

March 26 Order at pp. 18-19, ¶ 10.

2. On November 18, 2021, the Honorable Energy Bureau further stated that "[a]ll [of] PREPA's capital projects expenses require the Energy Bureau's approval." *Resolution and Order* entered on November 18, 2021 (emphasis in the original removed).

3. In compliance with the March 26 Order, PREPA herein submits for the Energy Bureau's review and approval the scope of work (SOW) for the PI System Engineering services and labor for infrastructure installation for: Aguirre Power Plant, Aguirre Combined Cycle, Cambalache, Mayaguez, Costa Sur, San Juan, and Palo Seco Generation Site of the Puerto Rico Electric Power

Authority (the "Project"). The Project works target the repair of damages plant suffered as a consequence of the direct hit of Hurricane Maria. PREPA has also identified it needs to perform works of conservation, repairs, and retrofitting of its generation units and their auxiliary equipment. This work is of the utmost importance to improve the reliability of the system.

4. Furthermore, Telecommunications is the central nerve of PREPA operations. The telecommunication network is essential for the safety, monitoring, control, operation & management, resilience and reliability of the generation plants. Also, improvements to the systems are required in order to comply with the industry standards and improve Critical Infrastructure Cyber Security. It is necessary to upgrade critical equipment for the information technology (IT) systems with operational technology (OT) systems ("IT/OT") for the data server rooms and infrastructure including supply, installation, and commissioning of hardware and software for all the PREPA plants.

5. PREPA herein presents the background of the Projects and also, the scope of works to be performed, and costs incurred for which PREPA will seek reimbursement from the Federal Emergency Management Administration ("FEMA").

6. Pursuant to the above, PREPA hereby details the works completed to repair damages sustained by the IT/OT system as well as necessary works to restore and improve the reliability of the system and submits them to the Energy Bureau for its evaluation and approval. The damages suffered, and the permanent works performed to address, restore and repair the IT/OT system are listed below.

a. IT/OT System Upgrade for: Aguirre Power Plant, Aguirre Combined Cycle, Cambalache, Mayaguez, Costa Sur, San Juan and Palo Seco (Exhibit A). The damages suffered are listed in Sec. 2.2 and the permanent works to be performed are listed in Sec. 3.1. The works

performed aimed to restore the facilities to pre-disaster function and to approved codes/standards. The codes and standards are detailed in Section 4. The total costs incurred in the permanent repair works to be performed in all Generation Plants total $ **11,423,825.00**. With the Energy Bureau's leave, PREPA will submit to FEMA a request for reimbursement of the entire amount spent under the Public Assistant program, pursuant Section 428 of the Stafford Act.

7. The above-listed projects are aligned with the operative IRP and Modified Action Plan approved by the Energy Bureau on August 24, 2021. *See Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan* entered in case no. CEPR-AP-2018-0001, *In Re: Review of the Puerto Rico Electric Power Authority Integrated Resource Plan*.

8. Notwithstanding, the SOW presented contains critical energy infrastructure information (CEII) that cannot be disclosed to the public. The CEII included in the SOWs are global positioning system (GPS) coordinates of the power plant.

9. The following is a detailed list of the information that PREPA asserts is confidential and must be kept under seal.

Exhibit	**Description**	**Confidential Information**	**Request for Confidentiality**
Exhibit A	IT/OT System Upgrade for: Aguirre Power Plant, Aguirre Combined Cycle, Cambalache, Mayaguez, Costa Sur, San Juan and Palo Seco	GPS Location Page 4, Sec. 2.1	CEII

10. Article 6.15 of the *Puerto Rico Energy Transformation and RELIEF Act*, Act no. 57 of 2014, as amended ("Act 57")[1], provides that "any person who is required to submit information to

[1] *Puerto Rico Energy Transformation and RELIEF Act,* Act no. 57 of May 27, 2014, 22 L.P.R.A. §§ 1051-1056.

the Energy [Bureau] believes that the information to be submitted has any confidentiality privilege, such person may request the [Bureau] to treat such information as such[.]" *Id.* at Sec. 6.15. "If the Energy [Bureau], after the appropriate evaluation, believes such information should be protected, it shall grant such protection in a manner that least affects the public interest, transparency, and the rights of the parties involved in the administrative procedure in which the allegedly confidential document is submitted." *Id.* at Sec. 6.15(a). If the Energy Bureau determines that the information is confidential, "the information shall be duly safeguarded and delivered exclusively to the personnel of the Energy [Bureau] who needs to know such information under nondisclosure agreements." *Id.* at Sec. 6.15(b). "The Energy [Bureau] shall swiftly act on any privilege and confidentiality claim made by a person subject to its jurisdiction by means of a resolution to such purposes before any allegedly confidential information is disclosed." *Id.* at Sec. 6.15(c).

11. Pursuant to its vested powers, the Energy Bureau approved the *Regulation on Adjudicative, Notices of Compliance, Rate Review and Investigations Proceedings* ("Regulation 8543").[2] Regarding the safeguards that the Energy Bureau gives to confidential information, Regulation 8543 provides that:

> [i]f in compliance with the provisions of [Regulation 8543] or any of the Energy Bureau's orders, a person has the duty to disclose to the Energy Bureau information considered to be privileged pursuant to the Rules of Evidence, said person shall identify the allegedly privileged information, request the Energy Bureau the protection of said information, and provide supportive arguments, in writing, for a claim of information of privileged nature. The Energy Bureau shall evaluate the petition and, if it understands the material merits protection, proceed according to what is set forth in Article 6.15 of Act No. 57-2014, as amended.

Regulation 8543 at Sec. 1.15.

[2] Energy Bureau, *Regulation on Adjudicative, Notices of Compliance, Rate Review and Investigations Proceedings*, No. 8543 (December 16, 2015).

12. Federal and Puerto Rico law protect the confidentiality of CEII, the public disclosure of which may pose a security threat in that the information could be useful to a person or group in planning an attack on critical infrastructure. *See, e.g.*, 18 C.F.R. § 388.113, as amended by Federal Energy Regulatory Commission (FERC) Order No. 683, *Critical Energy Infrastructure Information* (issued September 21, 2006); *USA Patriot Act of 2001*, § 1016, creating the *Critical Infrastructures Protection Act of 2001*, including 42 U.S.C. § 5195c(e) (defining Critical infrastructure). FERC regulations subject such information to limitations on use and disclosure to "ensure that information deemed CEII stays out of the possession of terrorists." 18 C.F.R. § 388.113(d)(4). *Off. of People's Counsel v. Pub. Serv. Commn*., 21 A.3d 985, 991, Util. L. Rep. P 27157, 2011 WL 2473405 (D.C. App. 2011).

13. Under the Critical Infrastructures Protection Act of 2001, the term "critical infrastructure" means "systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters." 42 U.S.C. § 5195c(e).

14. In 2006, FERC Order no. 683 amended the regulations for gaining access to CEII and simplified procedures for obtaining access to CEII without increasing vulnerability of the energy infrastructure and ensuring that access to CEII does not facilitate acts of terrorism.

15. A utility is not required to obtain FERC or other federal government approval in order to designate information as CEII. For example, information required by FERC's Annual Transmission Planning and Evaluation Report, Form No. 715, ("FERC No. 715"), is *de facto* considered CEII and is automatically afforded the heightened protections. FERC No. 715 requires that any transmitting utility that operates integrated (non-radial) transmission facilities at or above

100 kV must annually submit information including but not limited to: Power Flow Base Cases, Transmitting Utility Maps and Diagrams, Transmission Planning Reliability Criteria, Transmission Planning Assessment Practices, and Evaluation of Transmission System Performance. Any utility that submits the required transmission information pursuant to FERC No. 715 does so with the knowledge that, as stated in the Form's Instructions, FERC "considers the information collected by this report to be CEII and will treat it as such." *See also* 18 C.F.R. § 141.300(d) relating to the Form and CEII.

16. Mainland regulators typically do not require a utility that designates material as CEII to follow any process before the federal government in order to make or support such a designation, and, further, that the regulator, in its informed discretion, can establish limits on how information that it considers CEII can be accessed.

17. Furthermore, and regarding the argument made by PREPA, FERC has ruled on several occasions that global positioning system (GPS) coordinates of any project features "qualify as CEII because it provides more than just location." *See e.g.* Final Rule, Docket Nos. RM02-4-000, PL02-1-000; Order No. 630, Note 31, entered on February 21, 2003 (ruling that FERC considered the global positioning system coordinates of any project features (precise surveyed or GPS coordinates at or above two decimal points of accuracy of equipment and structures) gas information to qualify as CEII because it provides more than just location).[3]

18. The Energy Bureau, in prior dockets has accepted the Authority's designations of material as CEII, recognizing that both federal law and Puerto Rico law support such designations when applicable.[4] Accordingly, and pursuant to the above, it is respectfully requested that the Honorable

[3] Federal Register: March 3, 2003 (Volume 68, Number 41); Rules and Regulations, pp. 9857-9873.
[4] *See e.g. Resolution and Order* entered on August 27, 2019, in case no. CEPR-AP-2018-0001, *In Re: Review of the Puerto Rico Electric Power Authority Integrated Resource Plan*.

Energy Bureau find that the information categorized by PREPA as CEII is confidential and that the Secretary of the Energy Bureau be directed to keep the confidential CEII under seal.

WHEREFORE, PREPA respectfully requests the Energy Bureau to approve the above-listed Projects, find that the information categorized by PREPA as CEII is confidential and order the Secretary of the Energy Bureau to keep the confidential CEII under seal.

RESPECTFULLY SUBMITTED.

In San Juan Puerto Rico, 22nd day of June 2023.

Maralíz Vázquez-Marrero
Maralíz Vázquez-Marrero
mvazquez@diazvaz.law
TSPR No. 16,187

/s Joannely Marrero Cruz
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CERTIFICATE OF SERVICE

It is hereby certified that I have filed the foregoing with the Clerk of the Energy Bureau using the electronic filing system using https://radicacion.energia.pr.gov/login and also, that I have served a copy on LUMA Energy, LLC and LUMA Energy ServCo, LLC through their counsel of record at laura.rozas@us.dlapiper.com and margarita.mercado@us.dlapiper.com.

In San Juan Puerto Rico on this 22nd day of June 2023.

/s Joannely Marrero Cruz
Joannely Marrero Cruz

Exhibit A

Government of Puerto Rico

Puerto Rico Electric Power Authority

Hurricane Maria DR-PR-4339

PROJECT SCOPE OF WORK WITH COST ESTIMATES

Submittal to COR3 and FEMA

IT/0T System Upgrade for:
Aguirre Power Plant, Aguirre Combined Cycle, Cambalache, Mayaguez, Costa Sur, San Juan and Palo Seco

6/22/2023

Introduction

The purpose of this document is to present and update a Project Scope of Work (SOW) with Cost Estimates to be submitted to COR3 and FEMA for projects under DR-4339-PR Public Assistance. The completed document will be reviewed by COR3 and FEMA to create and version a specific project worksheet and post fixed-cost estimates to repair, restore, or replace eligible facilities including Section 406 hazard mitigation for a specific project.

Puerto Rico Electric Power Authority (PREPA) is the agency that provides the electric service to the entire island of Puerto Rico. As such, the facilities, sites, and systems identified in this Scope of Work are eligible as critical services facilities as defined in the PAAP (Section 428) and BBA 2018 guidance documents. Additional details may be found in Sections 3 and 4, respectively.

This document will be updated with information developed during the initial design and engineering phase through the construction phase.

The sections included in this document are:

- *Project Information*
- *Facilities*
- *Scope of Work*
- *Codes and Standards*
- *Cost Estimate*
- *406 Hazard Mitigation Proposal*
- *Environmental and Historic Preservation (EHP) Requirements*
- *Program Manager Certification*
- *PREPA Project Sponsor Comments*
- *Attachments*

Document Revision History

Version	Date	Summary of Changes
v.1	06/22/2022	

Section 1. Project Information

General Information

Recipient	Central Office for Recovery, Reconstruction and Resiliency (COR3)
Sub-Recipient	Puerto Rico Electric Power Authority (PREPA)
Project Title	Aguirre Power Plant, Aguirre Combined Cycle, Cambalache, Mayaguez, Costa Sur, San Juan, and Palo Seco – PI System Upgrade
PREPA Project Number	

Federal Information

(provided by FEMA)

Damage Number(s)	250040
Damaged Inventory/Asset Category	Island Wide Generation Plants
FEMA Project Number *(Formerly Project Worksheet)*	136271 - MEPA078 PREPA Island Wide FAASt Project, Hurricane Maria 4339DR-PR
Amendment Number	

Program Manager: ***<Name>***

<Insert title here>

PREPA Project Sponsor: ***<Name >***

<Insert title here>

Section 2. Facilities

2.1. Facilities List

Name	GPS Location
All Power Plants PI System Upgrade **1. Aguirre Power Plant** **2. Aguirre Combined Cycle** **3. Cambalache** **4. Mayaguez** **5. Costa Sur** **6. San Juan** **7. Palo Seco**	1. [redacted] 2. [redacted] 3. [redacted] 4. [redacted] 5. [redacted] 6. [redacted] 7. [redacted]

Note: *GPS coordinates are required for all facilities.*

2.2. Facilities Description

On September 20, 2017 the entire island of Puerto Rico was ravaged by Hurricane Maria, making landfall as high-end category 4 hurricane. As a result of severe winds, wind-driven debris, salt spray, storm surge, mudslides, flooding, and rain, all essential electrical delivery services including power generation were damaged or destroyed, resulting in a complete loss of power and the longest blackout in U.S. history.

Furthermore, PREPA needs to perform constantly works of conservation, repairs, and retrofitting of its generation units and their auxiliary equipment, including, without limitation, boilers, turbines, rotors, generators, motors, pumps, breakers, and control systems. These works are of the utmost importance as it has become more evident by the recent forced outages.

To improve the generation asset's reliability, increasing their availability, and provide continuous generation service to the People of Puerto Rico, it is crucial to keep these assets operational and in the best possible condition. Therefore, the prioritization of conservation, repairs, and retrofitting works projects is at the top priority list.

Telecommunications is the central nerve of PREPA operations. The telecommunication network is essential for the safety, monitoring, control, operation & management, resilience and reliability of the generation plants. Also, improvements to the systems are required in order to comply with the industry standards and improve the Critical Infrastructure Cyber Security.

It is necessary to upgrade critical equipment for IT/OT for the data server rooms and infrastructure including supply, installation, and commissioning of hardware and software for all Puerto Rico Electric Power Authority (PREPA) plants.

Section 3. Scope of Work

3.1. **Scope of Work**

The scope of work for the PI System Engineering services and labor for infrastructure installation for: Aguirre Power Plant, Aguirre Combined Cycle, Cambalache, Mayaguez, Costa Sur, San Juan, and Palo Seco Generation Site of the Puerto Rico Electric Power Authority (PREPA) included in this proposal will consist of the following:

Server Room Infrastructure and Hardware Labor:

- Removal of existing server rack components:
  - Network Firewall(s)
  - Network Switch(es)
  - Power Distribution Unit (PDUs)
  - Ethernet and Fiber Optic cables and terminations
  - Physical Server
  - Rack monitoring system
  - Backup system(s)
- Removal of existing server rack and installation of new server rack
- Installation of infrastructure/hardware on server room:
  - Rack mounted UPS
  - Network Firewalls
  - Network Switches
  - Rack mounted UPS
  - Rack monitoring system
  - Rack mounted display and KVM switch
  - Smart Power Distribution Unit (PDU)
  - High performance 1U rackmount 4 bay NAS for servers' backup
  - Power, ethernet, and fiber optic cables with their respective terminations

PI System Engineering Services:

- Preparation of virtual machines on new physical server for PI System main servers:
  - PI Data Archive Server (data historian)
  - PI Asset framework (calculations and email notifications)

o PI Vision Web Server (visualization)

- Installation and configuration of PI System main servers
- Firewall rules configuration
- Existing PI System backup
- Migration of existing PI System historical data to the new PI Data Archive Server
- Configure existing PI System Interfaces to send data to the new PI Data Archive Server
- PI-to-PI Interface configuration to send data to PI Central System

IT / OT Room Equipment:

SERVICE OR EQUIPMENT	DESCRIPTION	COST
2 BATTERY BANKS -48 V 400 AH EACH	GENERATING FACILITY AUXILIARY DC SYSTEMS	8,000
2 GE INFINITY RECTIFIER 4 MODULES 50 AMPS	GENERATING FACILITY AUXILIARY DC SYSTEMS	20,000
1 INVERTER 5000 WATTS	EMERGENCY POWER BACKUP FOR IT/OT EQUIPMENT	5,000
NON CONDUCTIVE MATERIAL CABLE TRAY SYSTEM	FOR ORGANIZING CABLING IN THE ROOM	15,000
RADIO UHF REPEATER LICENSED	GENERATING FACILITY COMM RADIO SYSTEM	7,000
RADIO BASE VHF LICENSED	ALTERNATE EMERGENCY RADIO SYSTEM	2,500
RACK MOUNTED DISPLAY AND KVM	MONITORS USED TO MAKE TROUBLESHOOTING OF SYSTEM	12,000
RACK MONITORING SYSTEM WITH TEMP, HUMIDITY, AND POWER SENSORS	MONITOR ALARMS IN THE ROOM	3,000
DC TO DC CONVERTER 48-24	EMERGENCY BACKUP POWER FOR RADIO REPEATERS	3,000
VOIP SWITCH	TELEPHONE SERVICE	300,000
PHONES VOIP	TELEPHONE SERVICE	125,000
WIRELESS CONTROLLER	WIRELESS ETHERNET SERVICE	25,000
WIRELESS ANTENNAS	WIRELESS ETHERNET SERVICE	25,000
6U RACK MOUNT SWITCH WITH 48GbE COPPER PORTS AND 2 SFP PORTS SM	IT/OT TRANSPORT INFRASTRUCTURE	20,000
ETHERNET ROUTER	IT/OT TRANSPORT INFRASTRUCTURE	8,000
FORTINET SECURE SD-WAN FIREWALL FORTI GATE	IT/OT TRANSPORT INFRASTRUCTURE	8,000
SINGLE MODE FIBER OPTIC JUMPERS LC-SC, SC-SC, ST-SC	IT/OT TRANSPORT INFRASTRUCTURE FIBER OPTICS	1,000
42U SERVER RACK WITH LOCKABLE DOORS	IT/OT TRANSPORT INFRASTRUCTURE	15,000
19" OPEN RACKS	RACKS FOR EQUIPMENT INSTALLATION	5,000
ANTENNAS	IT/OT TRANSPORT INFRASTRUCTURE MICROWAVE RADIOS	10,000
AVIAT MICROWAVES LICENSED	IT/OT TRANSPORT INFRASTRUCTURE MICROWAVE RADIOS	50,000
TELECOM TOWER	IT/OT TRANSPORT INFRASTRUCTURE MICROWAVE RADIOS	150,000
EMERGENCY GENERATOR WITH INSTALLATION	EMERGENCY POWER FOR IT/OT EQUIPMENT 19KVA 120/240	30,000
A/C UNITS	A/C FOR TELECOM ROOMS	10,000
4 DELL SERVERS	IT/OT SOFTWARE APPS INFRASTRUCTURE	100,000
SERVER BACKUP SYSTEM	GENERATION FACILITY NETWORK OPERATIONS CENTER	50,000
ETHERNET PACH PANELS	ETHERNET AND PHONE SERVICE INSTALLATIONS	2,500
GMT FUSE PANELS	IT/OT TRANSPORT INFRASTRUCTURE	2,500
2 IP READY SECURITY CAMERAS	GENERATION FACILITY NETWORK OPERATIONS CENTER	10,000
SECURITY CONTROLLED DOOR SENSORS	SECURITY ACCESS TO THE ROOM	6,000
SAT PHONE WITH CRADLE AND EXTERNAL ANTENNA	EMERGENCY OPERATIONS CENTER	4,200
UHF REPEATER	RADIO COMM SYSTEM	10,000
SC CONNECTOR TYPE SINGLE MODE FIBER TERMINATION BOXES	IT/OT TRANSPORT INFRASTRUCTURE FIBER OPTICS	15,000
FIBER CABLE 96 STRANDS CORNING SINGLE MODE	IT/OT TRANSPORT INFRASTRUCTURE FIBER OPTICS	10,000
MPLS SWITCH	IT/OT TRANSPORT INFRASTRUCTURE	75,000
MULTILOCK PADLOCKS	IT/OT ROOM SECURITY	2,500
	TOTAL	*$1,145,200.00*

Data Center Generation Plants:

1. Firewall (Cyber Security)
2. Servers – Rugged
3. Storage disk
4. Internal guard
5. Generator
6. Security cameras
7. Entrance and exit door magnets
8. Air conditioners
9. FS200 (Equipment Fire Protection)

3.2. Type of Project

Indicate whether the intended plan is a(n):

1. **Restoration to Codes/Standards**: Restores the facility(s) to pre-disaster function and to approved codes/standards
2. **Improved Project**: Restores the pre-disaster function of the facility(s) and incorporates improvements including any:
    a. Other improvements, not required by codes and standards
    b. Changes in facility size, capacity, dimension, or footprint
3. **Alternate Project:** Does not restore the pre-disaster function of the damaged facility(s)

Choose One (Restoration, Improved or Alternate) *If improved, provide the changes in facility size, capacity, dimension, or footprint. If alternate, provide rationale for recommendation.*
Restores to Codes/Standards

Note: *If preliminary Architectural and Engineering (A&E) work has not been completed, 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 the results of the completed preliminary A&E work.*

3.3. Preliminary Architectural and Engineering (A&E)

Is architectural and engineering funding required to help define the intended scope of work?

No

Project complexity does not require Architecture and/or Engineering services for design.

Section 4. Codes and Standards

Which of the following types of codes, specifications, and standards apply to the restoration, replacement, relocation, or alternate scope of work?

4.1. Codes, Specifications, and Standards

Yes/No. If yes, describe how incorporated below.
• (ASCE MOP 74) Guidelines for Electrical Transmission Line Structural Loading, Third Edition - American Society of Civil Engineers (ASCE) • (ASCE/SEI 7-16) Minimum Design Loads and Associated Criteria for Buildings and Other Structure - American Society of Civil Engineers (ASCE) • Distribution – 50-4, 1724D-106, 1724E-150, 1724E-151, 1724E-152, 1724E-153, 1725E-154, 1728F-700, 1728F-803, 1728F-804, 1728F-806, 1730B-121, 1730-B2 - U.S. Department of Agriculture Rural Electric Service (RUS) • International Building Code (IBC) - International Code Council (ICC) • International Energy Conservation Code (IECC) - International Code Council (ICC) • International Existing Building Code (IEBC) - International Code Council (ICC) • National Electric Safety Code (NESC) - Institute of Electrical and Electronics Engineers • National Electrical Code (NEC) - National Fire Protection Association (NFPA) • FM 4470 for Class 1 Roof Constructions - National Roofing Contractors Association (NRCA)

4.2. Industry Standards

Yes/No. If yes, describe how incorporated below.
• 2018 NFPA 101 Life Safety Code - National Fire Protection Association (NFPA) • 2010 NFPA 72 Fire Alarm and Signaling Code - National Fire Protection Association (NFPA) • ASCE.7 Section C 6.0 Wind Loads - American Society of Civil Engineers (ASCE) • International Building Code (IBC) - International Code Council (ICC) • Page 10 PREPA Standards and Specifications - Puerto Rico Electric Power Authority (PREPA) • Pattern Distribution Systems Manual - Puerto Rico Electric Power Authority (PREPA) • RUS - Applicable Bulletins for Electrical and Electronic Installations - US Department of Agriculture, Rural Utilities Service (RUS) • Underground Distribution Patterns Manual - Puerto Rico Electric Power Authority (PREPA)

Section 5. Cost Estimate

The estimate includes materials, construction labor and equipment, engineering, permitting, management, and contingencies. Cost is based historical pricing.

Cost Type	Amount ($M)
Services	$237,020.00
Equipment and Materials	$249,755.00
IT/OT Equipment	$1,145,200.00
Total Estimated Cost by Generation Plant	$1,631,975.00
Total Project Estimated Cost for All Generation Plants (7 – Seven Generation Plants)	**$11,423,825.00**

Section 6. 406 Hazard Mitigation Proposal

6.1. 406 Mitigation Opportunity Scope of Work

Hazard mitigation scope was not identified for this work.

6.2. 406 Mitigation Opportunity Cost Estimate

There are no costs associated with hazard mitigation.

Note: *If available, detailed engineering cost estimates will be included as an attachment.*

Section 7. EHP Requirements

EHP considerations will be detailed in PREPA's EHP scoping document and EHP Checklist. Review will be performed under FEMA's project formulation review.

Section 8. Program Manager Lead Certification

Based on my knowledge and information available to date, I certify that the contents of this document accurately reflect the project scope of work and cost estimates.

Program Manager's Printed Name	Date
Title	Signature

Section 9. PREPA Project Sponsor Comments

Comments
<Insert any comments here>

PREPA Project Sponsor's Printed Name

Date

Title

Signature

Section 10. Attachments

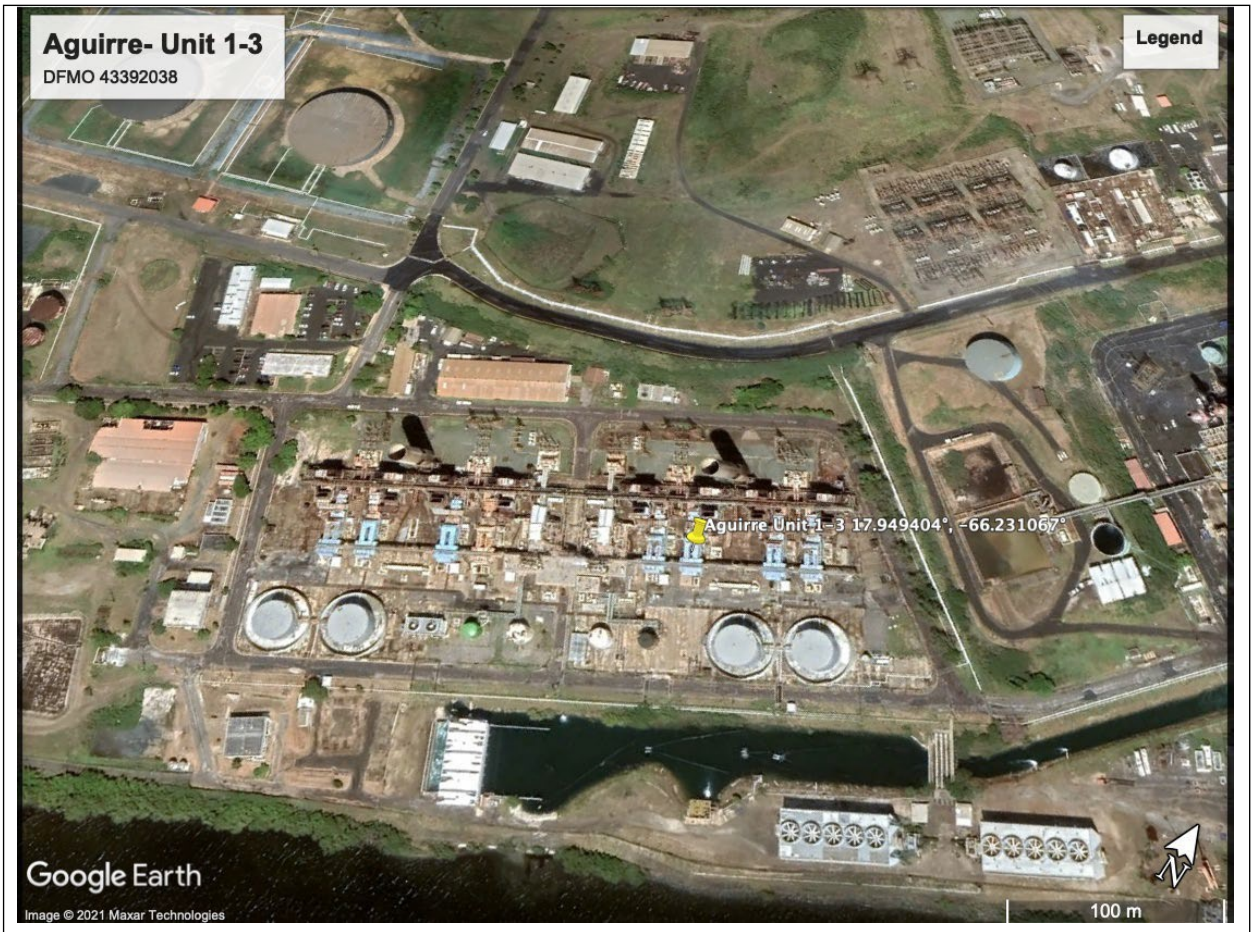
10.1. Project Detailed Cost Estimate Engineering Studies and Designs

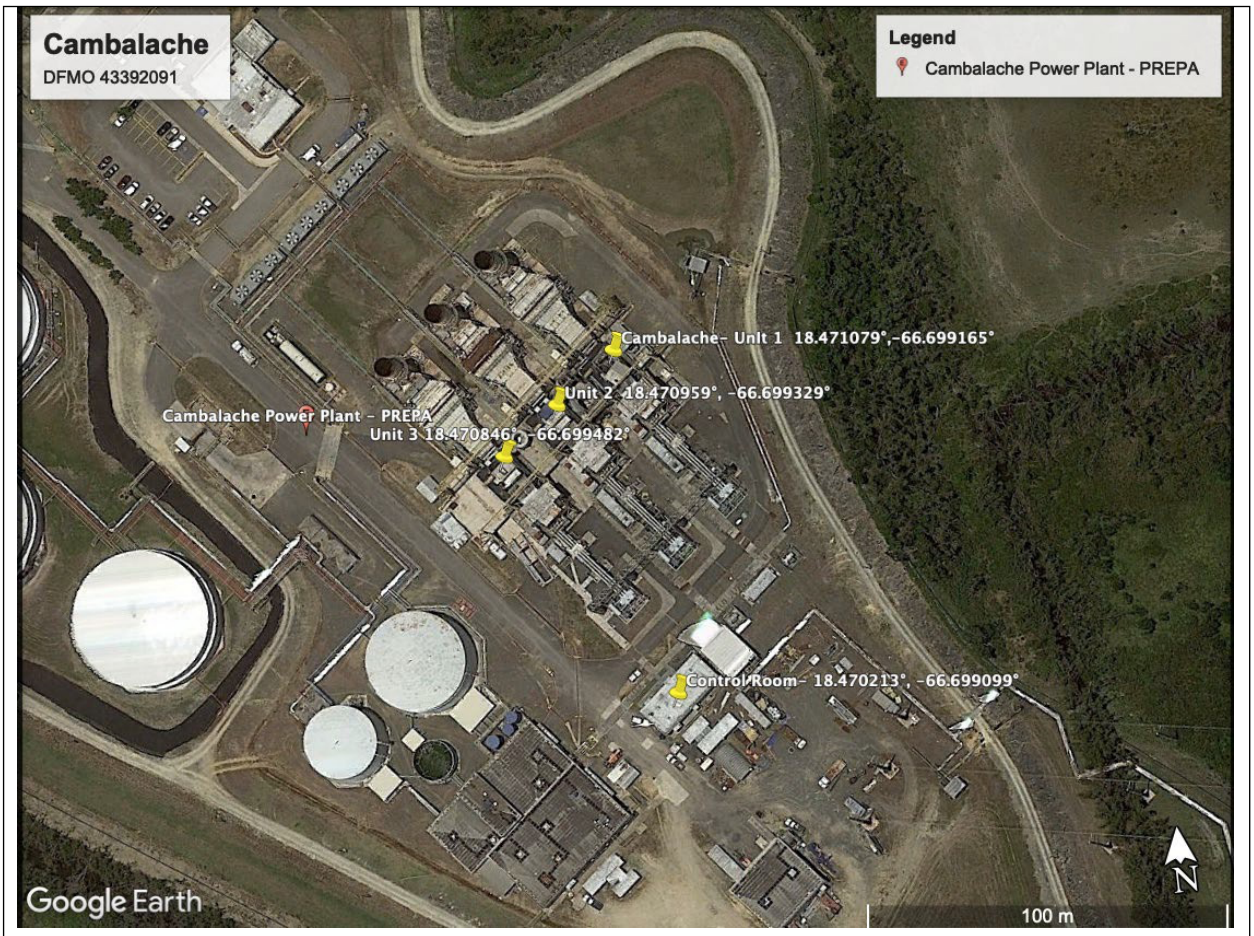
- *Please see attached proposal for cost estimates and scope of work details*

10.2. Engineering Studies and Designs

N/A

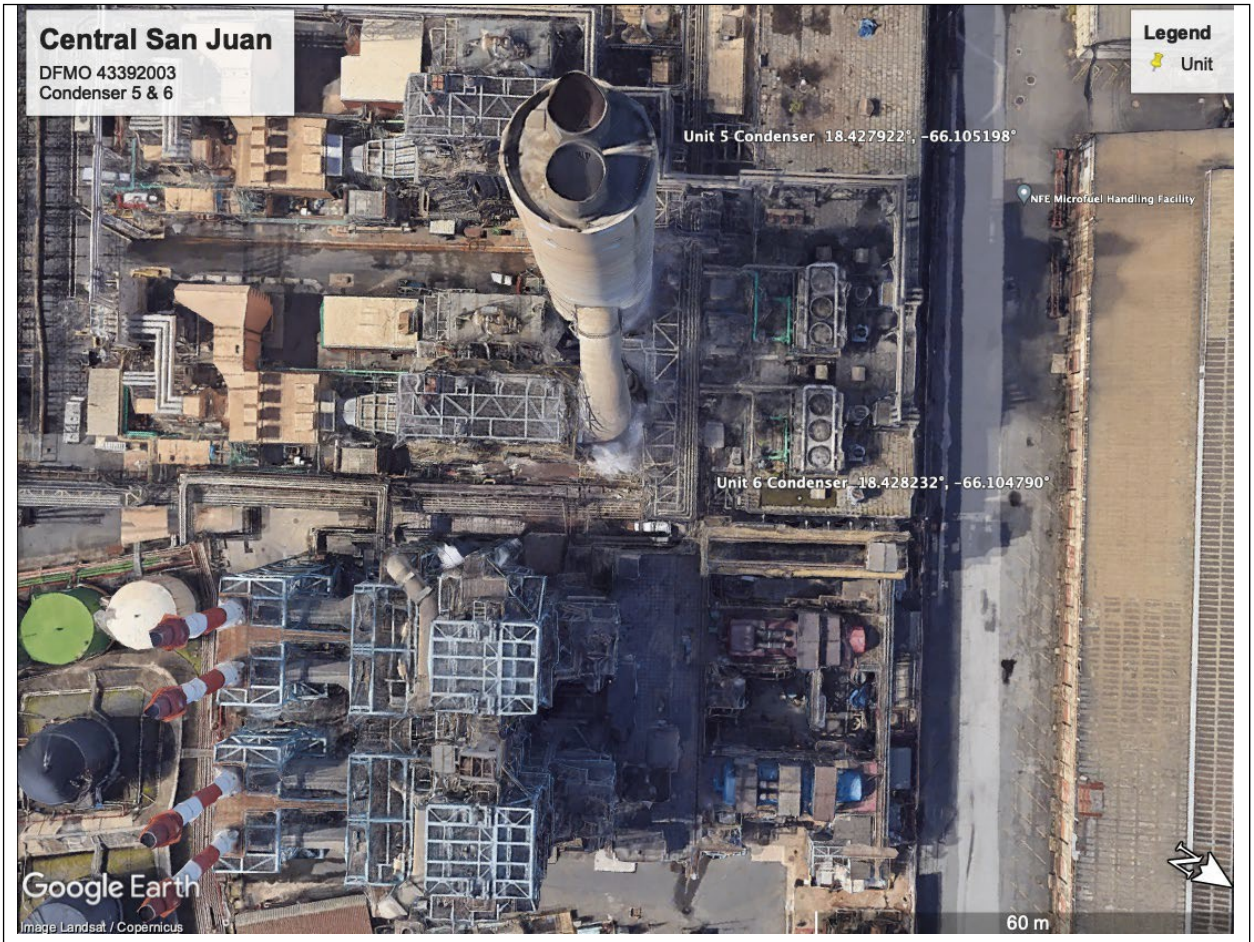
10.3. Location Maps and Site Pictures




Cambalache
DFMO 43392091
Legend
Cambalache Power Plant - PREPA
Cambalache- Unit 1 18.471079°,-66.699165°
Unit 2 18.470959°, -66.699329°
Cambalache Power Plant - PREPA
Unit 3 18.470846°, -66.699482°
Control Room- 18.470213°, -66.699099°
Google Earth
100 m
N


Mayaguez Power Plant-
DFMO 43392092
Legend
18.219462°, -67.160643°
A.E.E. Central Mayaguez
Google Earth
100 m
N


Costa Sur 5 & 6 Load centers
DFMO 43392055 & DFMO 43392056
PENUELAS
Unit 5 Load Center and Breakers 17.999852°, -66.754023°
Unit 6 Load Center and Breakers 17.999403°, -66.753759°


Central San Juan
DFMO 43392003
Condenser 5 & 6
Legend
Unit
Unit 5 Condenser 18.427922°, -66.105198°
NFE Microfuel Handling Facility
Unit 6 Condenser 18.428232°, -66.104790°
Google Earth
Image Landsat / Copernicus
60 m

10.1. Other: (Please Describe)

N/A

LTAutomation
Industrial Business Solutions

Proposal for

PUERTO RICO ELECTRIC POWER AUTHORITY

Upgrade to PI System Server Room
Located at Central Costa Sur

Puerto Rico
Electric Power
Authority

Proposal No: CI22-0609-00
June 9, 2022

LT Automation, Inc.
374 Ave. De Hostos
San Juan, PR 00918
www.ltapr.com

June 9, 2022

Puerto Rico Electric Power Authority
Attn: Eng. Edgar J. Erazo Alvelo
edgar.erazo@prepa.pr.gov
Ph: (787) 233-4011

Reference: Quote Number **CI22-0609-00**
PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for **Central Costa Sur**.

Dear Eng. Erazo,

LT Automation, Inc. is pleased to provide this quote for the PI System Server Rooms Upgrade including Supply, Installation and Commissioning of Hardware and Software for **Central Costa Sur** Generation Site of the Puerto Rico Electric Power Authority (PREPA).

The PI System Engineering services and labor for infrastructure installation included in this proposal are the following:

Server Room Infrastructure and Hardware Labor

- Removal of existing server rack components:
  - Network Firewall(s)
  - Network Switch(es)
  - Power Distribution Unit (PDUs)
  - Ethernet and Fiber Optic cables and terminations
  - Physical Server
  - Rack monitoring system
  - Backup system(s)
- Removal of existing server rack and installation of new server rack
- Installation of infrastructure/hardware on server room:
  - Rack mounted UPS
  - Network Firewalls
  - Network Switches
  - Rack mounted UPS
  - Rack monitoring system

- Rack mounted display and KVM switch
- Smart Power Distribution Unit (PDU)
- High performance 1U rackmount 4 bay NAS for servers' backup
- Power, ethernet, and fiber optic cables with their respective terminations

PI System Engineering Services

- Preparation of virtual machines on new physical server for PI System main servers:
  - PI Data Archive Server (data historian)
  - PI Asset framework (calculations and email notifications)
  - PI Vision Web Server (visualization)
- Installation and configuration of PI System main servers
- Firewall rules configuration
- Existing PI System backup
- Migration of existing PI System historical data to the new PI Data Archive Server
- Configure existing PI System Interfaces to send data to the new PI Data Archive Server
- PI-to-PI Interface configuration to send data to PI Central System

The quoted price for the Labor and PI System Engineering services, as mentioned in this proposal is:

TOTAL COST FOR SERVICES.....	*$237,020.00*

The equipment and materials for the upgrade of the server rooms infrastructure included in this proposal are the following:

- One (1) Fortinet Firewall
- One (1) Rack Mount Switch with 24 GbE copper ports and 2 SFP Combo Ports
- One (1) 42U Server Rack with lockable doors
- Two (2) Smart Power Distribution Units (PDUs)
- Two (2) 2,000VA Rackmount UPS System
- One (1) Rack Mounted Display and KVM Switch
- Two (2) Dell Servers:

  PowerEdge R750 Rack Server
  Chassis with up to 16x2.5" Drives
  Dual Intel® Xeon® Silver 4316 2.3G, 20C/40T
  192GB RDIMM, 3200MT/s, Dual Rank
  2 x 6.4TB Enterprise SSD
  2 x 960GB Enterprise SSD
  Dual, Hot-Plug, Fully Redundant Power Supply (1+1), 1400W, Mixed Mode
  Dual Port 10/25GbE SFP28
  Quad Port 1GbE BASE-T Adapter
  5 Year ProSupport and Next Business Day
- One (1) rack monitoring system for measurements of relative humidity, temperature

- One (1) High Performance 1U Rackmount 4 bay NAS for Backup with: 4 x 14TB 3.5 NAS HDD on RAID and Virtual Machine backup solution for Hyper-V virtual environments
- Power cables and conduits with required terminations
- Ethernet and Fiber Optic cables with terminations

The quoted price for the equipment and materials as listed in this proposal is:

TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***

Total Cost of Project

The Total Investment for the PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for Central Costa Sur is:

TOTAL COST FOR SERVICES……	***$237,020.00***
TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***
TOTAL PROJECT COST	***$486,775.00***

Notes:

1. This proposal does not include payment and performance bond.
2. Additional equipment, materials supply and/or services will be quoted separately.
3. This proposal does not include any OSIsoft PI System licenses. The existing PI System licenses (per site) will be used for the upgraded infrastructure.

LTAutomation
Industrial Business Solutions

Proposal for

PUERTO RICO ELECTRIC POWER AUTHORITY

Upgrade to PI System Server Room
Located at Central San Juan

Puerto Rico
Electric Power
Authority

Proposal No: CI22-0609-01
June 9, 2022

LT Automation, Inc.
374 Ave. De Hostos
San Juan, PR 00918
www.ltapr.com

June 9, 2022

Puerto Rico Electric Power Authority
Attn: Eng. Edgar J. Erazo Alvelo
edgar.erazo@prepa.pr.gov
Ph: (787) 233-4011

Reference: Quote Number **CI22-0609-01**
PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for **Central San Juan**.

Dear Eng. Erazo,

LT Automation, Inc. is pleased to provide this quote for the PI System Server Rooms Upgrade including Supply, Installation and Commissioning of Hardware and Software for **Central San Juan** Generation Site of the Puerto Rico Electric Power Authority (PREPA).

The PI System Engineering services and labor for infrastructure installation included in this proposal are the following:

Server Room Infrastructure and Hardware Labor

- Removal of existing server rack components:
  - Network Firewall(s)
  - Network Switch(es)
  - Power Distribution Unit (PDUs)
  - Ethernet and Fiber Optic cables and terminations
  - Physical Server
  - Rack monitoring system
  - Backup system(s)
- Removal of existing server rack and installation of new server rack
- Installation of infrastructure/hardware on server room:
  - Rack mounted UPS
  - Network Firewalls
  - Network Switches
  - Rack mounted UPS
  - Rack monitoring system

- Rack mounted display and KVM switch
- Smart Power Distribution Unit (PDU)
- High performance 1U rackmount 4 bay NAS for servers' backup
- Power, ethernet, and fiber optic cables with their respective terminations

PI System Engineering Services

- Preparation of virtual machines on new physical server for PI System main servers:
  - PI Data Archive Server (data historian)
  - PI Asset framework (calculations and email notifications)
  - PI Vision Web Server (visualization)
- Installation and configuration of PI System main servers
- Firewall rules configuration
- Existing PI System backup
- Migration of existing PI System historical data to the new PI Data Archive Server
- Configure existing PI System Interfaces to send data to the new PI Data Archive Server
- PI-to-PI Interface configuration to send data to PI Central System

The quoted price for the Labor and PI System Engineering services, as mentioned in this proposal is:

TOTAL COST FOR SERVICES.....	*$237,020.00*

The equipment and materials for the upgrade of the server rooms infrastructure included in this proposal are the following:

- One (1) Fortinet Firewall
- One (1) Rack Mount Switch with 24 GbE copper ports and 2 SFP Combo Ports
- One (1) 42U Server Rack with lockable doors
- Two (2) Smart Power Distribution Units (PDUs)
- Two (2) 2,000VA Rackmount UPS System
- One (1) Rack Mounted Display and KVM Switch
- Two (2) Dell Servers:

  PowerEdge R750 Rack Server
  Chassis with up to 16x2.5" Drives
  Dual Intel® Xeon® Silver 4316 2.3G, 20C/40T
  192GB RDIMM, 3200MT/s, Dual Rank
  2 x 6.4TB Enterprise SSD
  2 x 960GB Enterprise SSD
  Dual, Hot-Plug, Fully Redundant Power Supply (1+1), 1400W, Mixed Mode
  Dual Port 10/25GbE SFP28
  Quad Port 1GbE BASE-T Adapter
  5 Year ProSupport and Next Business Day
- One (1) rack monitoring system for measurements of relative humidity, temperature

- One (1) High Performance 1U Rackmount 4 bay NAS for Backup with: 4 x 14TB 3.5 NAS HDD on RAID and Virtual Machine backup solution for Hyper-V virtual environments
- Power cables and conduits with required terminations
- Ethernet and Fiber Optic cables with terminations

The quoted price for the equipment and materials as listed in this proposal is:

TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***

Total Cost of Project

The Total Investment for the PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for Central San Juan is:

TOTAL COST FOR SERVICES……	***$237,020.00***
TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***
TOTAL PROJECT COST	***$486,775.00***

Notes:

1. This proposal does not include payment and performance bond.
2. Additional equipment, materials supply and/or services will be quoted separately.
3. This proposal does not include any OSIsoft PI System licenses. The existing PI System licenses (per site) will be used for the upgraded infrastructure.

LTAutomation
Industrial Business Solutions

Proposal for

PUERTO RICO ELECTRIC POWER AUTHORITY

Upgrade to PI System Server Room
Located at Central Palo Seco

Puerto Rico
Electric Power
Authority

Proposal No: CI22-0609-02
June 9, 2022

LT Automation, Inc.
374 Ave. De Hostos
San Juan, PR 00918
www.ltapr.com

June 9, 2022

Puerto Rico Electric Power Authority
Attn: Eng. Edgar J. Erazo Alvelo
edgar.erazo@prepa.pr.gov
Ph: (787) 233-4011

Reference: Quote Number **CI22-0609-02**
PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for **Central Palo Seco**.

Dear Eng. Erazo,

LT Automation, Inc. is pleased to provide this quote for the PI System Server Rooms Upgrade including Supply, Installation and Commissioning of Hardware and Software for **Central Palo Seco** Generation Site of the Puerto Rico Electric Power Authority (PREPA).

The PI System Engineering services and labor for infrastructure installation included in this proposal are the following:

Server Room Infrastructure and Hardware Labor

- Removal of existing server rack components:
  - Network Firewall(s)
  - Network Switch(es)
  - Power Distribution Unit (PDUs)
  - Ethernet and Fiber Optic cables and terminations
  - Physical Server
  - Rack monitoring system
  - Backup system(s)
- Removal of existing server rack and installation of new server rack
- Installation of infrastructure/hardware on server room:
  - Rack mounted UPS
  - Network Firewalls
  - Network Switches
  - Rack mounted UPS
  - Rack monitoring system

- Rack mounted display and KVM switch
- Smart Power Distribution Unit (PDU)
- High performance 1U rackmount 4 bay NAS for servers' backup
- Power, ethernet, and fiber optic cables with their respective terminations

PI System Engineering Services

- Preparation of virtual machines on new physical server for PI System main servers:
  - PI Data Archive Server (data historian)
  - PI Asset framework (calculations and email notifications)
  - PI Vision Web Server (visualization)
- Installation and configuration of PI System main servers
- Firewall rules configuration
- Existing PI System backup
- Migration of existing PI System historical data to the new PI Data Archive Server
- Configure existing PI System Interfaces to send data to the new PI Data Archive Server
- PI-to-PI Interface configuration to send data to PI Central System

The quoted price for the Labor and PI System Engineering services, as mentioned in this proposal is:

TOTAL COST FOR SERVICES.....	*$237,020.00*

The equipment and materials for the upgrade of the server rooms infrastructure included in this proposal are the following:

- One (1) Fortinet Firewall
- One (1) Rack Mount Switch with 24 GbE copper ports and 2 SFP Combo Ports
- One (1) 42U Server Rack with lockable doors
- Two (2) Smart Power Distribution Units (PDUs)
- Two (2) 2,000VA Rackmount UPS System
- One (1) Rack Mounted Display and KVM Switch
- Two (2) Dell Servers:

  PowerEdge R750 Rack Server
  Chassis with up to 16x2.5" Drives
  Dual Intel® Xeon® Silver 4316 2.3G, 20C/40T
  192GB RDIMM, 3200MT/s, Dual Rank
  2 x 6.4TB Enterprise SSD
  2 x 960GB Enterprise SSD
  Dual, Hot-Plug, Fully Redundant Power Supply (1+1), 1400W, Mixed Mode
  Dual Port 10/25GbE SFP28
  Quad Port 1GbE BASE-T Adapter
  5 Year ProSupport and Next Business Day
- One (1) rack monitoring system for measurements of relative humidity, temperature

- One (1) High Performance 1U Rackmount 4 bay NAS for Backup with: 4 x 14TB 3.5 NAS HDD on RAID and Virtual Machine backup solution for Hyper-V virtual environments
- Power cables and conduits with required terminations
- Ethernet and Fiber Optic cables with terminations

The quoted price for the equipment and materials as listed in this proposal is:

TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***

Total Cost of Project

The Total Investment for the PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for Central Palo Seco is:

TOTAL COST FOR SERVICES……	***$237,020.00***
TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***
TOTAL PROJECT COST	***$486,775.00***

Notes:

1. This proposal does not include payment and performance bond.
2. Additional equipment, materials supply and/or services will be quoted separately.
3. This proposal does not include any OSIsoft PI System licenses. The existing PI System licenses (per site) will be used for the upgraded infrastructure.

LTAutomation
Industrial Business Solutions

Proposal for

PUERTO RICO ELECTRIC POWER AUTHORITY

Upgrade to PI System Server Room
Located at Central Aguirre

Puerto Rico
Electric Power
Authority

Proposal No: CI22-0609-03
June 9, 2022

LT Automation, Inc.
374 Ave. De Hostos
San Juan, PR 00918
www.ltapr.com

June 9, 2022

Puerto Rico Electric Power Authority
Attn: Eng. Edgar J. Erazo Alvelo
edgar.erazo@prepa.pr.gov
Ph: (787) 233-4011

Reference: Quote Number **CI22-0609-03**
PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for **Central Aguirre**.

Dear Eng. Erazo,

LT Automation, Inc. is pleased to provide this quote for the PI System Server Rooms Upgrade including Supply, Installation and Commissioning of Hardware and Software for **Central Aguirre** Generation Site of the Puerto Rico Electric Power Authority (PREPA).

The PI System Engineering services and labor for infrastructure installation included in this proposal are the following:

Server Room Infrastructure and Hardware Labor

- Removal of existing server rack components:
  - Network Firewall(s)
  - Network Switch(es)
  - Power Distribution Unit (PDUs)
  - Ethernet and Fiber Optic cables and terminations
  - Physical Server
  - Rack monitoring system
  - Backup system(s)
- Removal of existing server rack and installation of new server rack
- Installation of infrastructure/hardware on server room:
  - Rack mounted UPS
  - Network Firewalls
  - Network Switches
  - Rack mounted UPS
  - Rack monitoring system

- Rack mounted display and KVM switch
- Smart Power Distribution Unit (PDU)
- High performance 1U rackmount 4 bay NAS for servers' backup
- Power, ethernet, and fiber optic cables with their respective terminations

PI System Engineering Services

- Preparation of virtual machines on new physical server for PI System main servers:
  - PI Data Archive Server (data historian)
  - PI Asset framework (calculations and email notifications)
  - PI Vision Web Server (visualization)
- Installation and configuration of PI System main servers
- Firewall rules configuration
- Existing PI System backup
- Migration of existing PI System historical data to the new PI Data Archive Server
- Configure existing PI System Interfaces to send data to the new PI Data Archive Server
- PI-to-PI Interface configuration to send data to PI Central System

The quoted price for the Labor and PI System Engineering services, as mentioned in this proposal is:

TOTAL COST FOR SERVICES.....	*$237,020.00*

The equipment and materials for the upgrade of the server rooms infrastructure included in this proposal are the following:

- One (1) Fortinet Firewall
- One (1) Rack Mount Switch with 24 GbE copper ports and 2 SFP Combo Ports
- One (1) 42U Server Rack with lockable doors
- Two (2) Smart Power Distribution Units (PDUs)
- Two (2) 2,000VA Rackmount UPS System
- One (1) Rack Mounted Display and KVM Switch
- Two (2) Dell Servers:

  PowerEdge R750 Rack Server
  Chassis with up to 16x2.5" Drives
  Dual Intel® Xeon® Silver 4316 2.3G, 20C/40T
  192GB RDIMM, 3200MT/s, Dual Rank
  2 x 6.4TB Enterprise SSD
  2 x 960GB Enterprise SSD
  Dual, Hot-Plug, Fully Redundant Power Supply (1+1), 1400W, Mixed Mode
  Dual Port 10/25GbE SFP28
  Quad Port 1GbE BASE-T Adapter
  5 Year ProSupport and Next Business Day
- One (1) rack monitoring system for measurements of relative humidity, temperature

- One (1) High Performance 1U Rackmount 4 bay NAS for Backup with: 4 x 14TB 3.5 NAS HDD on RAID and Virtual Machine backup solution for Hyper-V virtual environments
- Power cables and conduits with required terminations
- Ethernet and Fiber Optic cables with terminations

The quoted price for the equipment and materials as listed in this proposal is:

TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***

Total Cost of Project

The Total Investment for the PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for Central Aguirre is:

TOTAL COST FOR SERVICES……	***$237,020.00***
TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***
TOTAL PROJECT COST	***$486,775.00***

Notes:

1. This proposal does not include payment and performance bond.
2. Additional equipment, materials supply and/or services will be quoted separately.
3. This proposal does not include any OSIsoft PI System licenses. The existing PI System licenses (per site) will be used for the upgraded infrastructure.

LTAutomation
Industrial Business Solutions

Proposal for

PUERTO RICO ELECTRIC POWER AUTHORITY

Upgrade to PI System Server Room
Located at Central Aguirre Combined Cycle

Puerto Rico
Electric Power
Authority

Proposal No: CI22-0609-04
June 9, 2022

LT Automation, Inc.
374 Ave. De Hostos
San Juan, PR 00918
www.ltapr.com

June 9, 2022

Puerto Rico Electric Power Authority
Attn: Eng. Edgar J. Erazo Alvelo
edgar.erazo@prepa.pr.gov
Ph: (787) 233-4011

Reference: Quote Number **CI22-0609-04**
PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for **Central Aguirre Combined Cycle**.

Dear Eng. Erazo,

LT Automation, Inc. is pleased to provide this quote for the PI System Server Rooms Upgrade including Supply, Installation and Commissioning of Hardware and Software for **Central Aguirre Combined Cycle** Generation Site of the Puerto Rico Electric Power Authority (PREPA).

The PI System Engineering services and labor for infrastructure installation included in this proposal are the following:

Server Room Infrastructure and Hardware Labor

- Removal of existing server rack components:
  - Network Firewall(s)
  - Network Switch(es)
  - Power Distribution Unit (PDUs)
  - Ethernet and Fiber Optic cables and terminations
  - Physical Server
  - Rack monitoring system
  - Backup system(s)
- Removal of existing server rack and installation of new server rack
- Installation of infrastructure/hardware on server room:
  - Rack mounted UPS
  - Network Firewalls
  - Network Switches
  - Rack mounted UPS
  - Rack monitoring system

- Rack mounted display and KVM switch
- Smart Power Distribution Unit (PDU)
- High performance 1U rackmount 4 bay NAS for servers' backup
- Power, ethernet, and fiber optic cables with their respective terminations

PI System Engineering Services

- Preparation of virtual machines on new physical server for PI System main servers:
  - PI Data Archive Server (data historian)
  - PI Asset framework (calculations and email notifications)
  - PI Vision Web Server (visualization)
- Installation and configuration of PI System main servers
- Firewall rules configuration
- Existing PI System backup
- Migration of existing PI System historical data to the new PI Data Archive Server
- Configure existing PI System Interfaces to send data to the new PI Data Archive Server
- PI-to-PI Interface configuration to send data to PI Central System

The quoted price for the Labor and PI System Engineering services, as mentioned in this proposal is:

TOTAL COST FOR SERVICES.....	*$237,020.00*

The equipment and materials for the upgrade of the server rooms infrastructure included in this proposal are the following:

- One (1) Fortinet Firewall
- One (1) Rack Mount Switch with 24 GbE copper ports and 2 SFP Combo Ports
- One (1) 42U Server Rack with lockable doors
- Two (2) Smart Power Distribution Units (PDUs)
- Two (2) 2,000VA Rackmount UPS System
- One (1) Rack Mounted Display and KVM Switch
- Two (2) Dell Servers:

  PowerEdge R750 Rack Server
  Chassis with up to 16x2.5" Drives
  Dual Intel® Xeon® Silver 4316 2.3G, 20C/40T
  192GB RDIMM, 3200MT/s, Dual Rank
  2 x 6.4TB Enterprise SSD
  2 x 960GB Enterprise SSD
  Dual, Hot-Plug, Fully Redundant Power Supply (1+1), 1400W, Mixed Mode
  Dual Port 10/25GbE SFP28
  Quad Port 1GbE BASE-T Adapter
  5 Year ProSupport and Next Business Day
- One (1) rack monitoring system for measurements of relative humidity, temperature

- One (1) High Performance 1U Rackmount 4 bay NAS for Backup with: 4 x 14TB 3.5 NAS HDD on RAID and Virtual Machine backup solution for Hyper-V virtual environments
- Power cables and conduits with required terminations
- Ethernet and Fiber Optic cables with terminations

The quoted price for the equipment and materials as listed in this proposal is:

TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***

Total Cost of Project

The Total Investment for the PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for Central Aguirre Combined Cycle is:

TOTAL COST FOR SERVICES……	***$237,020.00***
TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***
TOTAL PROJECT COST	***$486,775.00***

Notes:

1. This proposal does not include payment and performance bond.
2. Additional equipment, materials supply and/or services will be quoted separately.
3. This proposal does not include any OSIsoft PI System licenses. The existing PI System licenses (per site) will be used for the upgraded infrastructure.

LTAutomation
Industrial Business Solutions

Proposal for

PUERTO RICO ELECTRIC POWER AUTHORITY

Upgrade to PI System Server Room
Located at Central Cambalache

Puerto Rico
Electric Power
Authority

Proposal No: CI22-0609-05
June 9, 2022

LT Automation, Inc.
374 Ave. De Hostos
San Juan, PR 00918
www.ltapr.com

June 9, 2022

Puerto Rico Electric Power Authority
Attn: Eng. Edgar J. Erazo Alvelo
edgar.erazo@prepa.pr.gov
Ph: (787) 233-4011

Reference: Quote Number **CI22-0609-05**
PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for **Central Cambalache**.

Dear Eng. Erazo,

LT Automation, Inc. is pleased to provide this quote for the PI System Server Rooms Upgrade including Supply, Installation and Commissioning of Hardware and Software for **Central Cambalache** Generation Site of the Puerto Rico Electric Power Authority (PREPA).

The PI System Engineering services and labor for infrastructure installation included in this proposal are the following:

Server Room Infrastructure and Hardware Labor

- Removal of existing server rack components:
  - Network Firewall(s)
  - Network Switch(es)
  - Power Distribution Unit (PDUs)
  - Ethernet and Fiber Optic cables and terminations
  - Physical Server
  - Rack monitoring system
  - Backup system(s)
- Removal of existing server rack and installation of new server rack
- Installation of infrastructure/hardware on server room:
  - Rack mounted UPS
  - Network Firewalls
  - Network Switches
  - Rack mounted UPS
  - Rack monitoring system

- Rack mounted display and KVM switch
- Smart Power Distribution Unit (PDU)
- High performance 1U rackmount 4 bay NAS for servers' backup
- Power, ethernet, and fiber optic cables with their respective terminations

PI System Engineering Services

- Preparation of virtual machines on new physical server for PI System main servers:
  - PI Data Archive Server (data historian)
  - PI Asset framework (calculations and email notifications)
  - PI Vision Web Server (visualization)
- Installation and configuration of PI System main servers
- Firewall rules configuration
- Existing PI System backup
- Migration of existing PI System historical data to the new PI Data Archive Server
- Configure existing PI System Interfaces to send data to the new PI Data Archive Server
- PI-to-PI Interface configuration to send data to PI Central System

The quoted price for the Labor and PI System Engineering services, as mentioned in this proposal is:

TOTAL COST FOR SERVICES.....	*$237,020.00*

The equipment and materials for the upgrade of the server rooms infrastructure included in this proposal are the following:

- One (1) Fortinet Firewall
- One (1) Rack Mount Switch with 24 GbE copper ports and 2 SFP Combo Ports
- One (1) 42U Server Rack with lockable doors
- Two (2) Smart Power Distribution Units (PDUs)
- Two (2) 2,000VA Rackmount UPS System
- One (1) Rack Mounted Display and KVM Switch
- Two (2) Dell Servers:

  PowerEdge R750 Rack Server
  Chassis with up to 16x2.5" Drives
  Dual Intel® Xeon® Silver 4316 2.3G, 20C/40T
  192GB RDIMM, 3200MT/s, Dual Rank
  2 x 6.4TB Enterprise SSD
  2 x 960GB Enterprise SSD
  Dual, Hot-Plug, Fully Redundant Power Supply (1+1), 1400W, Mixed Mode
  Dual Port 10/25GbE SFP28
  Quad Port 1GbE BASE-T Adapter
  5 Year ProSupport and Next Business Day
- One (1) rack monitoring system for measurements of relative humidity, temperature

- One (1) High Performance 1U Rackmount 4 bay NAS for Backup with: 4 x 14TB 3.5 NAS HDD on RAID and Virtual Machine backup solution for Hyper-V virtual environments
- Power cables and conduits with required terminations
- Ethernet and Fiber Optic cables with terminations

The quoted price for the equipment and materials as listed in this proposal is:

TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***

Total Cost of Project

The Total Investment for the PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for Central Cambalache is:

TOTAL COST FOR SERVICES……	***$237,020.00***
TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***
TOTAL PROJECT COST	***$486,775.00***

Notes:

1. This proposal does not include payment and performance bond.
2. Additional equipment, materials supply and/or services will be quoted separately.
3. This proposal does not include any OSIsoft PI System licenses. The existing PI System licenses (per site) will be used for the upgraded infrastructure.

LTAutomation
Industrial Business Solutions

Proposal for

PUERTO RICO ELECTRIC POWER AUTHORITY

Upgrade to PI System Server Room
Located at Central Mayaguez

Puerto Rico
Electric Power
Authority

Proposal No: CI22-0609-06
June 9, 2022

LT Automation, Inc.
374 Ave. De Hostos
San Juan, PR 00918
www.ltapr.com

June 9, 2022

Puerto Rico Electric Power Authority
Attn: Eng. Edgar J. Erazo Alvelo
edgar.erazo@prepa.pr.gov
Ph: (787) 233-4011

Reference: Quote Number **CI22-0609-06**
PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for **Central Mayaguez**.

Dear Eng. Erazo,

LT Automation, Inc. is pleased to provide this quote for the PI System Server Rooms Upgrade including Supply, Installation and Commissioning of Hardware and Software for **Central Mayaguez** Generation Site of the Puerto Rico Electric Power Authority (PREPA).

The PI System Engineering services and labor for infrastructure installation included in this proposal are the following:

Server Room Infrastructure and Hardware Labor

- Removal of existing server rack components:
  - Network Firewall(s)
  - Network Switch(es)
  - Power Distribution Unit (PDUs)
  - Ethernet and Fiber Optic cables and terminations
  - Physical Server
  - Rack monitoring system
  - Backup system(s)
- Removal of existing server rack and installation of new server rack
- Installation of infrastructure/hardware on server room:
  - Rack mounted UPS
  - Network Firewalls
  - Network Switches
  - Rack mounted UPS
  - Rack monitoring system

- Rack mounted display and KVM switch
- Smart Power Distribution Unit (PDU)
- High performance 1U rackmount 4 bay NAS for servers' backup
- Power, ethernet, and fiber optic cables with their respective terminations

PI System Engineering Services

- Preparation of virtual machines on new physical server for PI System main servers:
  - PI Data Archive Server (data historian)
  - PI Asset framework (calculations and email notifications)
  - PI Vision Web Server (visualization)
- Installation and configuration of PI System main servers
- Firewall rules configuration
- Existing PI System backup
- Migration of existing PI System historical data to the new PI Data Archive Server
- Configure existing PI System Interfaces to send data to the new PI Data Archive Server
- PI-to-PI Interface configuration to send data to PI Central System

The quoted price for the Labor and PI System Engineering services, as mentioned in this proposal is:

TOTAL COST FOR SERVICES.....	*$237,020.00*

The equipment and materials for the upgrade of the server rooms infrastructure included in this proposal are the following:

- One (1) Fortinet Firewall
- One (1) Rack Mount Switch with 24 GbE copper ports and 2 SFP Combo Ports
- One (1) 42U Server Rack with lockable doors
- Two (2) Smart Power Distribution Units (PDUs)
- Two (2) 2,000VA Rackmount UPS System
- One (1) Rack Mounted Display and KVM Switch
- Two (2) Dell Servers:

  PowerEdge R750 Rack Server
  Chassis with up to 16x2.5" Drives
  Dual Intel® Xeon® Silver 4316 2.3G, 20C/40T
  192GB RDIMM, 3200MT/s, Dual Rank
  2 x 6.4TB Enterprise SSD
  2 x 960GB Enterprise SSD
  Dual, Hot-Plug, Fully Redundant Power Supply (1+1), 1400W, Mixed Mode
  Dual Port 10/25GbE SFP28
  Quad Port 1GbE BASE-T Adapter
  5 Year ProSupport and Next Business Day
- One (1) rack monitoring system for measurements of relative humidity, temperature

- One (1) High Performance 1U Rackmount 4 bay NAS for Backup with: 4 x 14TB 3.5 NAS HDD on RAID and Virtual Machine backup solution for Hyper-V virtual environments
- Power cables and conduits with required terminations
- Ethernet and Fiber Optic cables with terminations

The quoted price for the equipment and materials as listed in this proposal is:

TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***

Total Cost of Project

The Total Investment for the PI System Server Room Upgrade including Equipment and Material Supply, Installation, PI System Backup, Migration and Commissioning for Central Mayaguez is:

TOTAL COST FOR SERVICES……	***$237,020.00***
TOTAL COST FOR EQUIPMENT AND MATERIALS……	***$249,755.00***
TOTAL PROJECT COST	***$486,775.00***

Notes:

1. This proposal does not include payment and performance bond.
2. Additional equipment, materials supply and/or services will be quoted separately.
3. This proposal does not include any OSIsoft PI System licenses. The existing PI System licenses (per site) will be used for the upgraded infrastructure.