

BEFORE THE GUAM PUBLIC UTILITIES COMMISSION



IN THE MATTER OF:) GPA Docket 23-20
)
YIGO COMBUSTION TURBINE PLANT:)
PMC PROCUREMENT & REPAIRS) **ORDER**
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_____)

INTRODUCTION

1. This matter comes before the Guam Public Utilities Commission ["PUC"] upon the Petition of the Guam Power Authority ["GPA"] for Approval to Permit GPA's Performance Management Contractor ["PMC"], Taiwan Electric and Mechanical ["TEMES"], to procure a Hot Section Exchange and necessary generator repairs for the Yigo Combustion Turbine (CT) power plant.¹
2. The total cost to procure a Hot Section Exchange and necessary generator repairs for the Yigo CT is estimated at \$3.3M²; the expected cost for generator repairs, with transportation to and from an off-island facility, is \$1.5M. The replacement of the Hot Section Exchange can be performed on-site locally at a separate cost of \$1.8M. The funding source for the procurement and repairs will be GPA Revenue Funds.³
3. The estimated time for completion of Yigo CT generator repairs from the date of shipment is four months, and four months from the date of purchase order delivery for the Hot Section Exchange.⁴

¹ GPA Petition to Procure a Hot Section Exchange & Generator Repair for Yigo CT, GPA Docket 23-20, filed August 11, 2023.

² Id., at p. 1.

³ Id., at p. 2.

⁴ Id., at p. 3.

4. The immediate repair of the Yigo CT plant is critical to ensure sufficient load capacity in the Island-Wide Power System ["IWPS"].⁵

BACKGROUND

5. The Yigo CT has been in operation for more than 25 years and is necessary to support peak loads and base load unit outages.⁶
6. Prior to the landfall of typhoon Mawar on May 24, the Yigo CT was operational; it has remained offline post-Mawar.⁷
7. On May 27, 2023, the Yigo CT was started up to support the IWPS, reaching full speed with no load, but failed to synchronize due to an Exciter/Modular Automatic Voltage Regulator (MAVR) issue.⁸ TEMES arranged for a company, Baseload Power, to do a generator overhaul for the Yigo CT between July 8 and July 24.⁹
8. In a series of Daily Progress Reports, Baseload Power indicated numerous issues with the Yigo CT, including the following: failed tests for the Rotor, PMG, and Exciter; water coming out of line side links, cracking inside links insulation; tank

⁵ Id., at pgs. 2-3.

⁶ Id., at p. 1.

⁷ Id., at p. 1.

⁸ Guam Consolidated Commission on Utilities, GPA Resolution No. FY2023-24, Relative to Approval to Procure a Hot Section Exchange & Repair Generator for Yigo CT, adopted and approved on July 25, 2023, at Exhibit A-01-A-02.

⁹ Submission of Documents through email by Jennifer Sablan, GPA AGMO, to PUC ALJ Fred Horecky, dated August 15, 2023, Re: Yigo CT Procurement and Repairs.

hoses cracked; Exciter and exciter stator full of rust; water pouring out of generator compartment panel; Rotor corrosion; need for Rotor repair in the U.S.; etc.¹⁰

9. PMC TEMES concluded there was a need for a complete replacement of the Hot Section Exchange inside the turbine rotor and a full disassembly of the generator rotors. The Hot Section Exchange will be performed locally but the generator rotor must be shipped off-island for inspection and disassembly to determine whether coil replacements or a full rotor rewind is necessary.¹¹
10. As GPA's PMC for the Yigo CT, TEMES is seeking to retain a contractor for the Hot Section Exchange and Dry Combustor Rotable.¹²
11. On July 25, 2023, in GPA Resolution No. FY2023-24, the Guam Consolidated on Utilities authorized the GPA General Manager to contract TEMES for the Hot Section Exchange and Generator Repair for the Yigo CT at an estimated cost of \$3.3M.¹³
12. The ALJ filed his Report herein dated August 21, 2023.¹⁴ The Commissioners adopt the recommendations and conclusions therein.

DETERMINATIONS

- A. The Yigo CT will not be operational unless the Generator is repaired and the Hot Section Exchange replaced.

¹⁰ Id. at Baseload Power Daily Progress Reports.

¹¹ GPA Petition at Exhibit A-01.

¹² Submission of Documents through email by Jennifer Sablan, GPA AGMO, to PUC ALJ Fred Horecky, dated August 15, 2023, Re: Yigo CT Procurement and Repairs.

¹³ Id. at Exhibit A-01 and A-02.

¹⁴ ALJ Report, GPA Docket 23-20, dated August 21, 2023.

13. A “Hot Section Exchange” is a maintenance procedure for gas turbines that involves replacing or repairing the parts that are exposed to high temperatures, such as the combustor and the turbine blades.¹⁵

14. Following inspections and generator overhaul, the PMC TEMES determined that the generator rotor sections required repair:

- (a) The Yigo CT generator rotor was grounded, requiring further inspection and repairs which could not be done locally.¹⁶
- (b) The generator and exciter ground was likely caused by water intrusion into the generator from the typhoon as water was found coming from the panels during the generator disassembly.¹⁷
- (c) On May 9, 2023 an annual borescope inspection performed on the Yigo CT revealed the 3 cracks on the High-Pressure Turbine (HPT) stage 1 nozzles and rotor.
- (d) A Hot Section Exchange was required.¹⁸

15. The standard procedure for a Hot Section Exchange is an operation shutdown and removal and shipment of the engine to an OEM license depot.¹⁹

B. The Repair and Operation of the Yigo CT is essential to the Island-Wide Power System.

¹⁵ <https://vbr-turbinepartners.com/ge-lm-gas-turbine-maintenance/mechanical/hot-section-exchange/>

¹⁶ Guam Consolidated Commission on Utilities, GPA Resolution No. FY2023-24, Relative to Approval to Procure a Hot Section Exchange & Repair Generator for Yigo CT, adopted and approved on July 25, 2023, at p. 1.

¹⁷ Id.

¹⁸ Id.

¹⁹ <https://vbr-turbinepartners.com/ge-lm-gas-turbine-maintenance/mechanical/hot-section-exchange/#:~:text=The%20major%20share%20of%20your%20gas%20turbine%20maintenance,of%20the%20engine%20to%20an%20OEM%20licensed%20depot.>

16. In GPA Docket 21-12, which approved the replacement of the Yigo CT turbine, the PUC concurred with GPA's conclusion that the repair of the Yigo CT was "essential to the island-wide power system. Without the availability of the unit, there is the possibility of load shedding."²⁰

17. As a result of the loss of the Yigo CT's operating capacity of 20MW, there has been a reduction of the number of generating units able to support the IWPS. The shortage in load capacity, together with damages that the now under-construction Ukudu Power Plant sustained from typhoon Mawar, renders the immediate and long-term repairs to the Yigo CT to restore generation capacity even more critical.²¹

18. Prior to typhoon Mawar, GPA's total firm generation capacity was over 305MW; maintaining the current generation capacity is critical to meet the system demand until the commissioning of the Ukudu Power Plant.²²

C. The Continuing Maintenance cost of the Yigo CT is concerning, but GPA must spend the amounts necessary to return the Yigo CT to operation.

19. Since 2016 alone, the Yigo CT has cost GPA over \$11.6M in extraordinary repair and replacement costs. This amount does not even include ordinary operation and maintenance costs.²³

²⁰ PUC Order, GPA Docket 21-12, dated May 27, 2021, at p. 7.

²¹ GPA Petition, at pgs. 2-3.

²² Guam Consolidated Commission on Utilities, GPA Resolution No. FY2023-24, Relative to Approval to Procure a Hot Section Exchange & Repair Generator for Yigo CT, adopted and approved on July 25, 2023, at Exhibit A-02.

²³ GPA Docket 16-07, the PUC authorized GPA to replace the existing gas turbine, the estimated cost of which was \$2.3M. In GPA Docket 21-12, the PUC authorized GPA to expend \$6M for replacement of the Gas turbine and repairs. Now in this docket, GPA requests an additional \$3.3M for Yigo CT replacement and repairs.

20. However, GPA has an immediate need to shore up and increase its load capacity.

There have been Load shedding and power interruptions since Typhoon Mawar.

Replacement of the Hot Turbine Exchange and repairs of the generator appear to be the most immediately available solutions to increase GPA's load capacity.

21. PMC TEMES is now in the process of seeking proposals from other potential contractors, including Baseload Power, to undertake repairs to the rotor, exciter stator and PMG.²⁴

22. PUC authorization for GPA to contract with TEMES to procure and replace the Hot Section Exchange and to undertake the generator repairs for \$3.3M is reasonable, prudent, and necessary.

ORDERING PROVISIONS

After review of the record herein, including GPA's Petition for Approval to Permit GPA's Performance Management Contractor ["PMC"], Taiwan Electric and Mechanical ["TEMES"], to procure a Hot Section Exchange and necessary generator repairs for the Yigo Combustion Turbine (CT) power plant, and the ALJ Report, for good cause shown, on motion duly made, seconded and carried by the undersigned Commissioners, the Guam Public Utilities Commission **HEREBY ORDERS** that:


1. PUC authorizes TEMES to procure a contract for the replacement of the Hot Section Exchange and generator repairs for the Yigo CT.

²⁴ Submission of Documents through email by Jennifer Sablan, GPA AGMO, to PUC ALJ Fred Horecky, dated August 15, 2023, Re: Yigo CT Procurement and Repairs (FY2023 PIP/CIP Items for Yigo CT, Project: Repairs on Rotor, Exciter Stator and PMG (Yigo Main Generator), Technical Specifications.

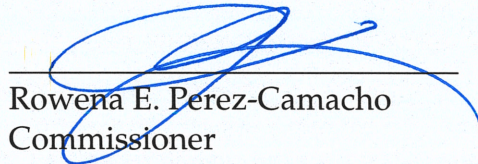
2. GPA may allocate up to the amount of \$3.3M in revenue funds for such replacement and repairs.
3. GPA is ordered to pay the Commission's regulatory fees and expenses, including, without limitation, consulting and counsel fees and the fees and expenses of conducting the hearing proceedings. Assessment of PUC's regulatory fees and expenses is authorized pursuant to 12 GCA §§12103(b) and 12125(b), and Rule 40 of the Rules of Practice and Procedure before the Public Utilities Commission.

[SIGNATURES TO FOLLOW ON NEXT PAGE]

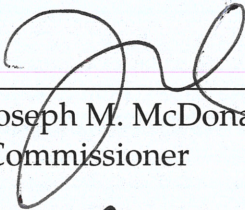
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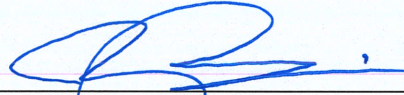
Jeffrey C. Johnson
Chairman



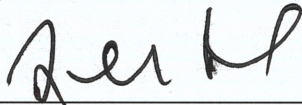
Rowena E. Perez-Camacho
Commissioner



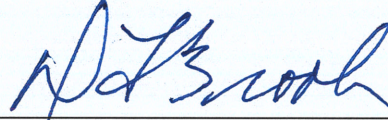
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