

BEFORE THE GUAM PUBLIC UTILITIES COMMISSION



IN THE MATTER OF:) GPA Docket 24-21
)
)
GUAM POWER AUTHORITY'S) ALJ REPORT
OVERHAUL OF PITI 7)
)
)

INTRODUCTION

This matter comes before the Guam Public Utilities Commission ["PUC"] upon the Petition of the Guam Power Authority ["GPA"] for Review and Approval of its Contract with Taiwan Electrical and Mechanical Engineering Services Inc. ["TEMES"] to Overhaul Piti 7.¹

BACKGROUND

The Piti 7 plant, a 40MW combustion turbine, was commissioned in December 1997 by TEMES under a build, operate and transfer (BOT) contract for a 20-year term. The plant was turned over to GPA in December of 2017 and has been operated and maintained by GPA ever since.² GPA seeks to perform a major gas turbine and generator overhaul of Piti 7 "to ensure the plant's reliability and availability until the new Ukudu power plant is commissioned." GPA states that "Piti 7 provides critical generation capacity until the Ukudu Power Plant is commissioned and will provide the necessary reserve capacity going forward."³

1 GPA Petition to Approve the Contract with TEMES Inc. to Overhaul Piti 7, GPA Docket 24-21, dated August 7, 2024.
2 Id. at p. 1.
3 Id.

The estimated cost of the overhaul of Piti 7 is \$3.5M. GPA further contends that the Piti 7 unit is “essential” to the island-wide power system.⁴

In GPA Resolution No. FY2024-24, the Guam Consolidated Commission on Utilities authorized GPA to petition the PUC for approval of its contract with TEMES under the PMC to purchase parts and labor for Piti 7 turbine and generator overhauls estimated at \$3.5M. The turbine and generator overhauls are planned for FY2025.⁵

ANALYSIS

The issue before the PUC is whether it should approve the overhauls of the Piti 7 turbine and generator at a cost of \$3.5M. The ALJ has submitted detailed Requests for Information to GPA. The Requests indicate concerns that the ALJ has with GPA’s Petition.⁶ The PUC Requests for Information and the GPA Responses are attached hereto collectively as Exhibit “1”.

A. Contract Review Protocol

The PUC-GPA Contract Review Protocol mandates that any contract which exceeds \$1,500,000 requires PUC approval.⁷ This contract must be reviewed by the PUC.⁸

B A Description of the Piti 7 Overhaul Project

GPA has not had a PMC for Piti 7 since 2017. In its Amendment No. 2 of its Performance Management Contract with TEMES for GPA’s Combustion Turbine Power

⁴ Id. at p. 2.

⁵ Guam Consolidated Commission on Utilities, GPA Resolution No. FY2024-24, Relative to Authorizing Guam Power Authority (GPA) Management to Overhaul Piti 7, adopted and approved on July 23, 2024.

⁶ PUC Requests for Information and GPA Responses, GPA Docket 24-21, Exhibit “1”.

⁷ Contract Review Protocol for Guam Power Authority, Administrative Docket, dated February 15, 2008, at par. 1(e).

⁸ Id. at par. 4(b).

Plants, dated December 12, 2023, GPA authorized the PMC TEMES to “provide operations and maintenance services to support the Piti 7 CT Plant, and other plants. The scope and price for such services were to be negotiated between GPA and TEMES.⁹ Piti 7 was not been included in the original Contract as one of the plants for which TEMES would be the performance management contractor.

TEMES will provide technical engineering and overhaul services regarding Piti 7. Attached hereto as Exhibit “2” is a portion of the TEMES Report for the 2016 Piti 7 Overhaul. Services included checks of the generator stator, auxiliary equipment, voltage transformer, ground resistance measurement, rotor, coil (megger test), stator coil (disassembly and cleaning), and others.¹⁰ The proposed overhaul may include similar services as those performed in 2016, but it may also include different services.

GPA estimates that there will be a \$3.5M cost for the proposed parts and labor to perform turbine and generator overhauls for Piti 7. GPA indicates that the cost of labor for the 2016 Piti 7 overhaul was approximately \$1M. It estimates the current cost of labor at \$1.5M.¹¹ By ordering “Refurbished” parts, GPA has reduced the cost of parts to \$1.4M. GPA has already purchased the first half of the parts at a cost of \$442,716.¹² GPA has submitted Attachments 1 and 2, which support such costs.

As to the Project schedule, GPA seeks to complete the project in FY2025:

“GPA has not previously performed an overhaul on this type of unit and has very little information since TEMES last overhauled Piti 7 in 2016. The start date of the project is

⁹ GPA Responses to PUC RFIs, GPA Docket 24-21, Attachment 1.

¹⁰ PUC Request for Information, GPA Docket 24-21, at par. 7, Attachment 4.

¹¹ Email from GPA Attorney Marianne Woloschuk to PUC ALJ Fred Horecky, Re: Requests for Information, GPA Docket 24-21, dated August 22, 2024.

¹² Id.

subject to the availability and delivery of parts, which is estimated to take 4 to 6 months. Upon the PUC's approval of the project in August 2024 and provided that the parts arrive in the expected time, the overhaul work can begin in February or March 2025. The actual overhaul is estimated to take 20 to 30 days in April 2025. The project should be completed by May 2025 if all goes according to plan.”¹³

There are many other costs that just the \$3.5M repair which will be incurred by GPA with the continued operation of the Piti 7 plant. GPA has already incurred fuel costs of over \$32.8M in FY 2024 for Piti 7 operation and millions of additional dollars in fuel handling and operation and maintenance costs. See Exhibit “3”, Piti 7 Cost to Produce, attached hereto.¹⁴ These fuel and other costs will be repeating on an annual basis for so long as Piti 7 is in operation. Yearly costs could exceed \$40M, as was the case in FY2023.¹⁵

C. There are issues as to whether the expenditure of \$3.5M on the Piti 7 Overhaul, as well as on the continuing annual operating expenses, are reasonable, prudent or necessary expenses.

Piti 7 is the second most costly plant to operate in the island-wide power system. Its fuel cost per kilowatt-hour is \$0.3345, making it the second most expensive plant in terms of fuel costs after the Dededo CT plants.¹⁶ Of all plants, Piti 7 has one of the lowest rates of production of kWh per barrel, and one of the highest heat rates. Given the expensive cost and low efficiency of Piti 7, it is not necessarily evident as to why

¹³ Id.

¹⁴ Email from GPA Attorney Marianne Woloschuk to PUC ALJ Fred Horecky, re: Requests for Information, GPA Docket 24-21, dated August 19, 2024, Piti 7 Cost to Produce.

¹⁵ Id.

¹⁶ PUC Request for Information, GPA Docket 24-21, at par. 3, Exhibits 1 & 2.

GPA would seek to expend \$3.5M for a gas turbine generator and overhaul on Piti 7 when the Ukudu plant will be in operation in one year.

The Ukudu plant will add almost 200MW of demand capacity to the GPA power system and the 41MW Hanwha solar plant will come online in September of 2026. In addition, there are several other power sources that have either placed in or restored to the power system recently, including the 20MW of temporary power at the Yigo CT, as well as the repair of the Yigo combustion CT. Work is being done to increase the production of the Tenjo vista units, and repairs are contemplated to the Yigo Diesel 40MW units.

On August 24, GPA announced that it will be seeking approval for two new Phase IV solar projects totaling 192 MW.¹⁷

With all this additional energy production coming into the system, Piti 7 could potentially be retired after the Ukudu plant comes online. The expenditure of \$3.5M, and the over \$40M of operating expense for each continuing year of operation, could be avoided. It also appears that a contemplated overhaul of Piti 7 was supposed to be performed in 2022, but was never done.

D. Notwithstanding the above concerns, GPA has presented several convincing justifications as to why the PUC should approve the Piti 7 overhaul.

- (1) In recent years, there has been insufficient generation power capacity to meet ratepayer demand. As the Petition indicates, Piti 7 will provide “critical

¹⁷ <https://edition.pagesuite-professional.co.uk/html5/reader/production/default.aspx?pubname=&pubid=5357166a-437c-4b2c-9983-d9639655a6e7>

generation capacity until the Ukudu power plant is commissioned”, a period of about one year.¹⁸

- (2) GPA does intend to keep Piti 7 in operation after the commissioning of Ukudu Power Plant for at least the next 5 years. After the Ukudu power plant is commissioned and the Hanwha 41MW solar PV project comes online in March of 2026, there will be no additional capacity to support peak until almost two years later under the Phase IV solar bids.¹⁹
- (3) When other units are down, Piti 7 provides reserve capacity to support maintenance schedules for other units.
- (4) In the next few years, GPA is anticipating load growth based upon its discussions with the military and the private sector. GPA wishes to ensure capacity that can meet future growth. At present, Piti 7, which has a full capacity of 40MW, is only producing 23MW.²⁰ Previously, GPA had discussions with the military indicating that potential load requirements over the span of 10 years could increase the load by 50MW. In its Attachment 2, GPA has listed developments and estimated loads which include approximately 38MW of military projects.²¹ Also, GPA estimates that private and government projects will increase load by 36MW. This increase includes data centers, apartment buildings, schools and commercial businesses.²²
- (5) There will be some loss of generation capacity regarding the 40MW Yigo diesels. Only a portion of the units can be restored (probably 20MW total recovery at most).²³

¹⁸ GPA Petition at p. 1.

¹⁹ GPA Responses to PUC RFIs, GPA Docket 24-21, dated August 21, 2024, at Response No. 2.

²⁰ Id. at Response No. 3.

²¹ Id. at Response No. 4.

²² Id.

²³ Id.


(6) During the period from 2016 through 2024, Piti 7 has produced generation of between 30,250,739 kWh and 124,015,229 kWh per year. While Piti 7's production has not reached that of the baseload plants, its production for 2023 appears to be higher than that of the other combustion turbine plants.²⁴ GPA asserts that the delay of the retirement of Piti 7 is in GPA's best interest and will avoid any unnecessary future temporary contracts or other programs for additional generation that can be more costly or complicated to execute.²⁵

RECOMMENDATION

Despite the considerable costs for the Piti 7 overhaul, and its continued operation, GPA has justified the expenditure of funds. It is necessary for GPA to maintain adequate generation capacity so that the demand of the island-wide power system can be met. In addition, the material provided by GPA suggests that there will be a considerable increase in load from both the military and private sectors in the upcoming years. Since Piti 7 is an existing asset in the power system, it makes sense to maintain such asset rather than procuring other temporary power resources. The ALJ recommends that the PUC approve the contract award to TEMES of \$3.5M to perform turbine and generator overhauls for Piti 7.

A Proposed Order is submitted herewith for the consideration of the Commissioners.

Dated this 24th day of August, 2024.


Frederick J. Horecky
Chief Administrative Law Judge

²⁴ PUC Request for Information, GPA Docket 24-21, at par. 3, Exhibit 2.

²⁵ Id. at RFI No. 9.

BEFORE THE GUAM PUBLIC UTILITIES COMMISSION

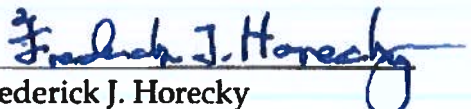
IN THE MATTER OF:) GPA Docket 24-21
)
GUAM POWER AUTHORITY'S)
OVERHAUL OF PITI 7)
) PUC REQUESTS FOR INFORMATION
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_____)

The Guam Public Utilities Commission ["PUC"] hereby requests that the Guam Power Authority ["GPA"] respond to the enclosed Requests for Information on or before August 20, 2024.

1. Please provide a copy of the proposed contract with TEMES (not attached to the Petition as Exhibit "A").
2. After the new Ukudu plant comes online (estimated to be September 2025), does GPA intend to keep Piti 7 in operation? If so, for how many years will GPA keep Piti 7 in operation, and what does GPA estimate the life expectancy of the Piti 7 plant to be?
3. Piti 7 appears to be one of the costliest plants to operate in the island wide power system. Its fuel cost per kilowatt hour is \$0.3345, making it the second most expensive plant in terms of fuel costs after the Dededo CT plants. See Exhibit 1 attached hereto (a Breakdown of GPA Generation, Fuel Cost and Cost/kWh, prepared by Georgetown Consulting Group in GWA Docket 24-05). Of all plants, Piti 7 has one of the lowest rates for production of kWh per barrel, and one of the highest heat rates. See Exhibit 2 attached hereto (LEAC Reconciliation Attachment III, GPA Docket 24-20, for FY2023). Given the expensive cost and low efficiency of Piti 7, why would GPA seek to spend \$3.5M on a gas turbine generator and overhaul on Piti 7 when the Ukudu plant will be in operation in about one year?
4. Why will it be necessary for GPA to keep the Piti 7 plant in operation after the new Ukudu plant comes online?
5. Should Piti 7 not be one of the first plants retired after Ukudu comes online?

6. Please provide a monthly breakdown for Piti 7 generation (kWh) for 2016 through 2024 to date.
7. Please provide a statement of all costs for the operation and maintenance of Piti 7 by GPA from 2016 to the present. Include all costs, i.e. management fees of TEMES on an annual basis, as PMC, personnel, fuel costs, and costs for CIP projects.
8. Aren't there many other generation sources that can provide power "essential to the island wide power system", including the Yigo CT, the 20MW of Temporary Power Services at the Yigo CT, the approved 41MW Hanwha solar plant, and the over 300MW of solar power contemplated in the Phase IV project?
9. Could one not conclude that Piti 7 is superfluous, too expensive, and not needed?
10. Please indicate how many overhauls have been conducted by GPA pr TEMES for Piti 7 since its inception.
11. The Petition states that there was a overhaul in 2016 and one contemplated in 2022. Was the 2022 overhaul performed?

Submitted on this 15th day of August, 2024.


Frederick J. Horecky
Chief Administrative Law Judge

GPA Generation, Fuel Cost and Cost/kWh			
April 2024 Fiscal YTD			
From May 2024 GPA Report to CCU			
Plant	Generation kW	Fuel Cost	Cost/kWh
Cabras I & 2	327,851,000	\$81,169,659	\$0.2476
Cabras No. 3	0		\$0.0000
Cabras No. 4			\$0.0000
MEC (ENRON) Piti 8 & 9 (IPP)	341,460,170	58,690,933	\$0.1719
TEMES Piti 7 (IPP)	64,294,672	21,506,026	\$0.3345
Tanguisson 2	0		\$0.0000
Tanguisson I			\$0.0000
Diesels/CT's & Others:			\$0.0000
MDI IOMW	2,678,734	575,457	\$0.2148
NRG Solar Dandan	27,599,006		\$0.0000
KEPCO Mangilao Solar	84,492,719		\$0.0000
Dededo CT #1	31,697,970	11,248,680	\$0.3549
Dededo CT #2	25,616,430	9,467,805	\$0.3696
Macheche CT	39,736,373	10,413,873	\$0.2621
Yigo CT	216,503	52,457	\$0.2423
Tenjo	8,620,910	1,591,846	\$0.1846
Talofoto 10 MW	1,915,795	411,261	\$0.2147
Aggreko/Yigo Diesel Units	17,756,815	4,577,803	\$0.2578
Deferred Fuel Costs		(5,443,331)	\$0.0000
Fuel Handling Costs		19,001,476	\$0.0000
Totals	973,937,097	\$213,263,945	\$0.2190

- Next, Staff included Ukudu in the above table assuming that it operated 75% of the time, then replace the higher cost generation with Ukudu. The result is that when Ukudu begins operation in September of 2025, GPA's average cost of generation will decline from about \$.219/kWh, before Ukudu, to about \$.1506/kWh, as shown in the table below:

**LEAC
RECONCILIATION
ATTACHMENT III**

**FY2023 ACTUAL
LEAC RECOVERY
Through September 2023**

EXHIBIT "2"

Grand Power Authority
Actual Generation, Fuel, Sales & Losses
Fiscal Year 2023

Description	Actual Oct-22	Actual Nov-22	Actual Dec-22	Actual Jan-23	Actual Feb-23	Actual Mar-23	Actual Apr-23	Actual May-23	Actual Jun-23	Actual Jul-23	Actual Aug-23	Actual Sep-23	Actual TOTAL
Tenjo Visa													
Generation (Kwh)	4,530	0	1,060	428,900	603,320	2,542,650	743,030	441,430	527,920	2,247,810	2,920,480	3,108,800	13,662,090
Kwh/Barrel	58	0	584	587	599	595	590	597	597	598	593	585	592
Total Barrels	8	0	718	1,006	1,006	4,274	1,259	740	884	3,928	4,927	5,316	23,062
Member/Kwh (Fixed Rate)	9,872	0	9,833	9,887	9,852	9,750	9,822	9,722	9,716	9,702	9,784	9,919	9,791
Managers (MDD)													
Generation (Kwh)	216,505	393,439	0	155,141	0	155,141	131,299	337,201	1,614,935	525,064	770,999	1,356,066	5,530,139
Kwh/Barrel	616	624	0	620	0	623	620	621	620	626	620	620	621
Total Barrels	353	630	0	249	0	249	212	543	2,607	828	1,244	2,207	8,906
Member/Kwh (Fixed Rate)	9,415	9,291	0	9,517	0	9,517	9,361	9,347	9,502	9,122	9,361	9,361	9,334
Telef66													
Generation (Kwh)	221,060	341,350	0	180,690	0	180,690	129,590	255,100	2,410,110	924,810	508,250	792,070	5,767,540
Kwh/Barrel	596	603	0	588	0	593	595	599	592	591	592	588	591
Total Barrels	371	566	0	305	0	305	218	433	4,089	1,566	858	1,347	9,766
Member/Kwh (Fixed Rate)	9,733	9,821	0	9,776	0	9,776	9,439	9,434	9,439	9,422	9,791	9,843	9,812
NRG Solar Davidson													
Generation (Kwh)	3,095,905	3,246,030	3,367,366	3,155,566	3,715,257	4,203,722	4,264,603	3,191,571	402,287	2,912,821	3,207,529	3,017,126	38,397,112
Kwh/Barrel	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Barrels	0	0	0	0	0	0	0	0	0	0	0	0	0
Member/Kwh (Fixed Rate)	0	0	0	0	0	0	0	0	0	0	0	0	0
LEDPOO Mangilao Solar													
Generation (Kwh)	8,992,072	11,742,233	10,972,203	10,644,781	11,010,625	12,642,188	12,335,969	9,756,839	1,257,591	8,310,607	10,463,938	10,018,197	116,441,723
Kwh/Barrel	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Barrels	0	0	0	0	0	0	0	0	0	0	0	0	0
Member/Kwh (Fixed Rate)	0	0	0	0	0	0	0	0	0	0	0	0	0
Melcho CT													
Generation (Kwh)	0	0	0	0	0	0	0	0	0	0	0	0	0
Kwh/Barrel	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Barrels	0	0	0	0	0	0	0	0	0	0	0	0	0
Member/Kwh (Fixed Rate)	0	0	0	0	0	0	0	0	0	0	0	0	0
Aggravo													
Generation (Kwh)	4,430,730	7,484,950	6,260,336	8,456,029	4,075,330	4,237,286	1,012,361	848,664	7,588,541	5,256,977	4,785,155	4,979,570	59,416,632
Kwh/Barrel	550	579	579	589	585	483	486	475	486	476	462	479	502
Total Barrels	8,063	14,134	11,844	15,404	7,478	8,764	2,169	1,785	15,604	11,034	10,354	10,390	117,046
Member/Kwh (Fixed Rate)	10,555	10,942	10,972	10,567	10,642	11,990	12,626	12,802	11,927	12,174	12,536	12,102	11,426
Wind Turbine													
Generation (Kwh)	0	0	0	0	0	0	0	0	0	0	0	0	0
Kwh/Barrel	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Barrels	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Gen. Kwh (CTDSSL)	13,435,205	41,911,453	32,416,252	49,342,387	42,399,238	56,197,738	45,002,897	41,397,146	49,511,080	47,651,670	53,429,243	53,108,028	549,233,079
Total Barrels	268,104	66,571	61,730	84,617	67,619	94,993	70,212	74,543	117,854	88,825	98,239	102,238	958,574
Price per Barrel	141.00	145.48	139.94	123.33	125.31	139.94	114.21	110.80	104.37	112.68	108.81	102.89	119.93
Total Cost	8,025,148	8,411,608	8,839,916	10,464,571	8,473,846	11,333,596	8,653,252	8,199,437	12,300,792	9,954,639	10,691,526	12,086,998	114,979,345
Total Gross Generation	13,435,205	41,911,453	32,416,252	49,342,387	42,399,238	56,197,738	45,002,897	41,397,146	49,511,080	47,651,670	53,429,243	53,108,028	549,233,079
Total Barrels	268,104	66,571	61,730	84,617	67,619	94,993	70,212	74,543	117,854	88,825	98,239	102,238	958,574
Total Fuel Costs	31,676,300	35,746,840	34,721,518	31,434,725	27,563,717	29,977,140	27,539,222	24,999,227	22,066,147	27,746,669	26,920,763	28,107,112	356,479,381
Sales (Kwh)													
Civilian	100,548,874	102,996,121	103,461,446	98,049,320	99,267,607	100,338,641	101,242,992	84,839,839	71,228,004	101,368,525	101,982,123	99,398,651	1,156,394,174

August 21, 2024

GPA Response to PUC RFI

GPA Docket 24-21

1. Please provide a copy of the proposed contract with TEMES (not attached to the Petition as Exhibit "A").

GPA Response:

Please see **Attachment 1** for the TEMES CT PMC Contract with Amendments 1&2.

2. After the new Ukudu plant comes online (estimated to be September 2025), does GPA intend to keep Piti 7 in operation? If so, for how many years will GPA keep Piti 7 in operation, and what does GPA estimate the life expectancy of the Piti 7 plant to be?

GPA Response:

Yes, GPA does intend to keep Piti 7 in operation after the commissioning of Ukudu Power Plant at least for the next 5 years. After Ukudu Power Plant is commissioned and the Hanwha 41 MW solar PV project is online by March 2026, no additional capacity to support peak will be available until almost 2 years later under the Phase IV bids, assuming there are contracts awarded by end of this year (3 years for construction). GPA is anticipating load growth based discussions with military and the private sector. Piti 7 also provides reserve to support maintenance schedules for other units. GPA should ensure capacity can meet future growth.

After major overhaul the combustion turbine should have inspections every 8000 hours for any abnormal wear and tear or damage. The next major overhaul would typically be 30,000 equivalent operating hours which is the combination of actual run hours and a weighted number of starts. (I.E. actual hours + (10x number of starts).

Generator overhauls are generally done every 5 years as preventive maintenance.

3. Piti 7 appears to be one of the costliest plants to operate in the island wide power system. Its fuel cost per kilowatt hour is \$0.3345, making it the second most expensive plant in terms of fuel costs after the Dededo CT plants. See Exhibit 1 attached hereto (a Breakdown of GPA Generation, Fuel Cost and Cost/kWh, prepared by Georgetown Consulting Group in GWA Docket 24-05). Of all plants, Piti 7 has one of the lowest rates for production of kWh per barrel, and one of the highest heat rates. See Exhibit 2 attached hereto (LEAC Reconciliation Attachment III, GPA Docket 24-20, for FY2023). Given the expensive cost and low efficiency of Piti 7, why would GPA seek to spend \$3.5M on a gas turbine generator and overhaul on Piti 7 when the Ukudu plant will be in operation in about one year?

GPA Response:

After Ukudu Power Plant is commissioned and the Hanwha 41 MW solar PV project online by March 2026, no additional capacity to support peak will be available until almost 2 years later under the Phase IV bids, assuming there are contracts awarded by end of this year (3 years for construction). GPA is anticipating load growth based discussions with military and the private sector as well as a reserve to support maintenance schedules for other units. GPA should ensure capacity can meet future growth.

Piti 7 has been operating at is less than desired output at 23MW lowering its efficiency. The overhaul of the turbine and other maintenance requiring extended outage will improve the plant output and improve efficiency. Please also see response to #4 below.

4. Why will it be necessary for GPA to keep the Piti 7 plant in operation after the new Ukudu plant comes online?

GPA Response:

The following are several reasons to maintain Piti 7 for the next 5 years. This year GPA has already seen an increase in peak since May 2023 from 257MW to 267MW and a listing of projects being developed for both military and non-military are currently estimated at 75MW of potential new loads.

- **Military Growth** – While GPA has had some discussions with the military, potential load requirement discussions at one time indicated an increase load of 50MW over the span of 10 years. To date GPA has not obtained a confirmation of total load requirements or schedules from all the DOD facilities, which includes Navy upgrades, new Marine Base installation, and Army missile defense support. **Attachment 2** is a listing of developments and estimated loads GPA is monitoring which includes approximately 38MW of military projects.
- **Private Developments** – Also in **Attachment 2** private and government projects are estimated at 36MW. These includes data centers, apartment buildings, schools, and commercial businesses totaling approximately 35MW. While applications and information are pending on most GPA has been provided some information to anticipate them.
- **Maintenance Reserve** – The GPA units that will remain after the commissioning of the Ukudu Plant will require maintenance due to their continuous operations to support the IWPS with Ukudu’s commissioning delay. Hours based maintenance for the combustion turbine units and diesel engines will need to be performed requiring outages. GPA will need to program some much needed repairs and upgrades that require time and money over the next few years to improve reliability and operational efficiencies with required maintenance. Reserve

capacity should be adequate to maintain at least an “N-2” or loss of the two largest units and still support peak.

- **Loss of Generation Capacity** – A recent evaluation of the Yigo diesels by Aggreko have determined that all the units will need to undergo major overhauls and other repairs estimated at over \$400K per unit which is more than a replacement cost of the units. Yigo Diesels were originally 40 MWs of temporary power after the Cabras 3&4 explosion. GPA had attempted twice to place these units under a Performance Management Contract but was delayed by protests. GPA is presently examining the repair/relocation projects for the Yigo Diesel units for a 20MW total recovery of these units, a reduction of the original site recovery by half.

At this time while GPA anticipates the Hanwha project to commission by 2026, until then it is difficult to assume no further delays will occur. GPA should take a prudent approach to ensure that there is enough capacity to meet demand and have a reserve margin, most especially to support the planned missile defense systems and support services. Likewise, the Phase IV contracts which can take three years to commission new projects after they are awarded, but there is no certainty on the commissioning dates. Once these projects are or nearly commissioned GPA should evaluate the need for remaining fossil fueled units.

5. Should Piti 7 not be one of the first plants retired after Ukudu comes online?

GPA Response:

Projection of load growth over the next several years is not typical. There is a significant amount of projected load that was not initially planned but with the planned renewables the additional load will bring more revenue that could further lower costs. The transition of the fossil-fueled production to the renewable should still be managed carefully so as not reduce capacity too early while contracts have not been signed and new customer loads are developing of significant size. In the meantime, the delayed overhaul is impacting the operation of the unit, its efficiency and reliability.

6. Please provide a monthly breakdown for Piti 7 generation (kWh) for 2016 through 2024 to date.

GPA Response:

Please see **Attachment 3** - Piti 7 Generation Monthly for 8 years.

7. Please provide a statement of all costs for the operation and maintenance of Piti 7 by GPA from 2016 to the present. Include all costs, i.e. management fees of TEMES on an annual basis, as PMC, personnel, fuel costs, and costs for CIP projects.

GPA Response:

Please see **Attachment 4** for operation and maintenance costs for Piti 7 from 2016 to present. Note that the TEMES IPP contract expired on December 2017 which terminated the annual TEMES management fees. Additionally, majority of CIP costs in FY2023 was related to the fuel inspection/conversion of the GPA bulk storage Tank 1935 and the new ULSD pipelines to support the conversion and supply lines (within Piti area) to the Piti 7, MEC 8&9 and Ukudu Plants.

GPA recently expanded the TEMES CT PMC to include procurement support for Piti 7 which does not include additional staff but an administrative cost for procurement of items.

8. Aren't there many other generation sources that can provide power "essential to the island wide power system", including the Yigo CT, the 20MW of Temporary Power Services at the Yigo CT, the approved 41MW Hanwha solar plant, and the over 300MW of solar power contemplated in the Phase IV project?

GPA Response:

Once sufficient capacity is provided GPA will be able to economically dispatch units which can reduce operating costs. However, reserve margins should be maintained to address potential growth and plant outages planned and forced. As mentioned, once contracts are in place and new project loads and schedules are firmed up GPA will be able to comfortably look at retirement of its costlier assets.

9. Could one not conclude that Piti 7 is superfluous, too expensive, and not needed?

GPA Response:

The delay of the retirement of Piti 7 is in GPA's best interest and will avoid any unnecessary future temporary contracts or other programs that can be more costly or complicated to execute. GPA is also not dealing with normal load growth as potentially there could be a significant demand increase due to military projects and projects like data centers which have constant load.

10. Please indicate how many overhauls have been conducted by GPA or TEMES for Piti 7 since its inception.

GPA Response:

Piti 7 has not had a major overhaul since 2016, when TEMES turned the plant over to GPA.

11. The Petition states that there was a overhaul in 2016 and one contemplated in 2022. Was the 2022 overhaul performed?

GPA Response:

No overhaul was performed in 2022. Borescope inspections in 2018 identified potential recommendations for a projected overhaul in 2022 but was not performed.

Summary of Attachments

Attachment 1 – CT PMC Contract (2016)_thru Amendment 2

Attachment 2 – Engineering Service Orders (July 2024)

Attachment 3 – Piti 7 Generation Monthly for 8 years

Attachment 4 – Piti 7 Cost

THE GUAM PITI UNIT NO.7 GENERATOR REPAIR REPORT**C、TEAM MEMBER :**

ENGINEER : 陳金生 (CHEN, JIN-SHENG)

MECHANICAL TECNICIAN : 卓勝錡 (CHO, SHENG-CHI)

(JUNE 01, 2016 ~ JUNE 24, 2016)

D、OVERHAUL ITEMS :**THE FIRST. GENERATOR STATOR CHECK ITEMS INCLUDING :**

- (A). GENERATOR STATOR COIL MEGGER TEST (INCLUDING SOFT COPPER DISASSEMBLES, CLEANED AND ASSEMBLE).
- (B). GENERATOR STATOR COIL DATA MEASURED (INCLUDING RESISTANCE, MEGGER TEST).
- (C). GENERATOR CURRENT TRANSFORMER (C. T) DATA TEST (RESISTANCE, MEGGER TEST).
- (D). GENERATOR STATOR COIL RESISTANCE TESTS

THE SECOND. GENERATOR AUXILIARY EQUIPMENT CHECK ITEMS**INCLUDING :**

- (A). GENERATOR VOLTAGE TRANSFORMER (V. T) DATA MEASURED (INCLUDING PRIMARY & SECOND RESISTANCE, MEGGER AND FUSE RESISTANCE).
- (B). EXCITER TRANSFORMER DATA MEASURED (INCLUDING PRIMARY & SECOND RESISTANCE, MEGGER).
- (C). ARRESTER DATA MEASURED (MEGGER).
- (D). NEUTRAL TRANSFORMER DATA MEASURED (PRIMARY & SECOND RESISTANCE, MEGGER).

THE GUAM PITI UNIT NO.7 GENERATOR REPAIR REPORT

- (E). GROUND RESISTANCER DATA MEASURED (RESISTANCE, MEGGER).
- (F). 52G BKR. (52G BREAKER) DATA MEASURED (RESISTANCE, MEGGER , SINGLE PHASE CONTACT RESISTANCE&MEGGER , PHASE TO PHASE MEGGER, THE MEGGER OF SINGLE PHASE TO GROUND).
- (G). FUSE RESISTANCE MEASURED.

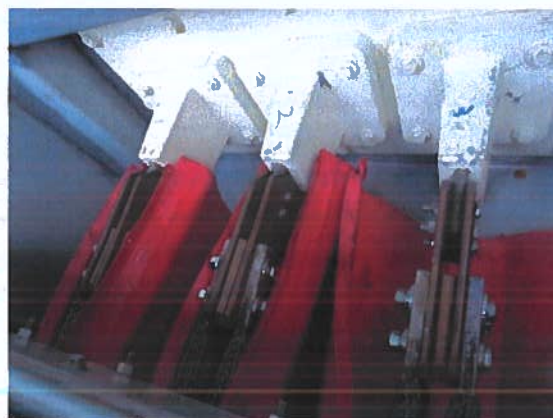
THE THIRD. GENERATOR ROTOR CHECK ITEMS INCLUDING :

- (A). GENERATOR RESISTANCE & MEGGER TEST.
- (B). GENERATOR SLIP RING VISUAL INSPECTION.

E. CONTENTS OF OVERHAUL :

GENERATOR STATOR PARTS

- ONE. STATOR COIL SOFT COPPER DISASSEMBLED, CLEANED AND ASSEMBLED
 - (1) TORQUE : 45FT-LB .
 - (2) NEED TO BE MEASURED STATOR COIL MEGGER BEFORE ASSEMBLING.
 - (3) SOFT COPPER : CONFIRM A. R AND P. I VALUE THEN ASSEMBLING.
 - (4) USING SILICONE STICK IT AFTER GREEN COVER WAS ASSEMBLED TO AVOID RAINWATER PERMEATING INTO COVER.



THE GUAM PITI UNIT NO. 7 GENERATOR REPAIR REPORT

1. GENERATOR STATOR COIL MEGGER TEST ----- P1
2. GENERATOR AUXILIARY EQUIPMENT TEST&CHEK ----- P2
3. GEN. CT RESISTANCE & MEGGER TEST----- P3
4. GEN. R.T.D CHECK----- P4~P5
5. GENERATOR ROTOR&STATOR COIL ELECTRIC TEST ----- P6
6. 52G BRK CHECK & TEST ----- P7
7. FUSE TEST ----- P8

TAIWAN POWER COMPANY - POWER EQUIPMENT REPAIR AND MAINTANCE DEPARTMENT

No. 80, Xiangyang Rd., Nangang Dist., Taipei City 115, Taiwan (R.O.C.)

TEL : (02)27853199

FAX : 27855675

GENERATOR ROTOR&STATOR COIL ELECTRIC TEST

TEST DATE: 2016.06.17

(一). ROTOR TEST

賴育勤

(1) ROTOR WINDING RESISTANCE TEST

RESISTANCE = 91 mΩ TEMP : 32 °C MEGGER TEST : 148 MΩ For 500VDC

(二). GEN. STATOR WINDING RESISTANCE TEST

(1) AØ : 4.63 mΩ (2) BØ : 4.60 mΩ (3) CØ : 4.61 mΩ TEMP : NA °C

TESTER : 卓勝筠 INSTRUMENT F02397

EFFECTIVE 2016.10.02

REVIEWER : 陳金生 NUMBER : F02628

DATE : 2017.02.04

賴育勤

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Piti 7

Cost to Produce

Note: Piti 7 Unit was turned over to GPA from TEMES in December 2017.

	YTD 07.31.24	FY 2023	FY 2022	FY 2021	FY 2020	FY 2019	FY 2018	FY 2017	FY 2016
Operating & maintenance	789,646 \$	952,029 \$	1,323,802 \$	1,250,674 \$	1,284,737 \$	1,183,669 \$	903,098 \$	4,353,441 \$	4,081,741 \$
IPP-O&M							834,005 \$	626,209 \$	2,190,732 \$
IPP-Debt Service									
Fuel Cost	32,811,205 \$	41,173,900 \$	52,431,062 \$	12,765,021 \$	6,110,205 \$	12,744,646 \$	9,287,462 \$	8,490,996 \$	15,941,188 \$
Fuel Handling Cost	1,002,956 \$	1,422,857 \$	1,626,982 \$	599,185 \$	350,494 \$	463,967 \$	318,948 \$	365,372 \$	525,966 \$
CIP	241,524 \$	539,549							