BEFORE THE GUAM PUBLIC UTILITIES COMMISSION

IN THE MATTER OF:	)	GPA Docket 22-19
	)	
The Application of the Guam Power Authority for Approving the Contract with TEMES, Inc. for Macheche CT Repairs.	)	**ALJ REPORT**

INTRODUCTION

1. This matter comes before the Guam Public Utilities Commission ["PUC"] upon the Petition of the Guam Power Authority ["GPA"] for Review and Approval of GPA's request to contract with TEMES, Inc. for the Macheche CT Repairs.[1]

2. GPA seeks to replace the Macheche turbine package with a fully refurbished gas turbine.[2]

3. The turbine replacement and repairs will cost $3,953,417.60, using revenue funds.[3]

BACKGROUND

4. TEMES, Inc. is presently GPA's Performance Management Contractor to provide services for the Macheche CT.[4]

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[1] GPA Petition for Approving the Contract with TEMES, Inc. for Macheche CT Repairs, GPA Docket 22-19, filed September 6, 2022.
[2] Id. at p. 1.
[3] Id.
[4] Id.

5. The Macheche Combustion Turbine (CT) power plant was commissioned in 1993 and has been in operation for approximately 29 years.[5]

6. TEMES has been the Performance Management Contractor for the Macheche Combustion Turbine power plant since March 1, 2016.[6]

7. TEMES recommended to GPA that it replace the turbine package with a fully refurbished gas turbine to prevent catastrophic failure caused by existing operations over the maximum run time.[7]

8. The Macheche power plant is rated at 22MW and consists of one GE LM2500 combustion turbine generator with 26,757 operating hours, which is beyond the recommended service life of 25,000 hours.[8]

9. At present, the Macheche unit is available but limited in operation to only emergency use.[9]

10. TEMES issued a request for bids for this project and 3 bids were submitted for consideration from Field Source-Energy Services, Trans Canada Turbine, and Gas Turbine Investments.[10]

[5] Guam Consolidated Commission on Utilities GPA Resolution No. FY2022-28, Authorizing the Management of the Guam Power Authority to Implement and Complete the Turbine Exchange for the Macheche Combustion Turbine Power Plant, adopted and approved on August 23, 2022, at p. 1.
[6] See PUC Orders, GPA Docket 15-22, dated January 25, 2016, at p. 4, and GPA Docket 21-03, dated November 30, 2020.
[7] GPA Petition for Approving the Contract with TEMES, Inc. for Macheche CT Repairs, GPA Docket 22-19, filed September 6, 2022, at p. 1.
[8] Guam Consolidated Commission on Utilities GPA Resolution No. FY2022-28, Authorizing the Management of the Guam Power Authority to Implement and Complete the Turbine Exchange for the Macheche Combustion Turbine Power Plant, adopted and approved on August 23, 2022, at p. 1.
[9] Id.

11. A GPA/TEMES Evaluation Committee determined that Gas Turbine Investments was the lowest responsible bidder at a cost of $3,953.417.60.[11]

12. GPA and the PMC intend to minimize the down time of the unit, complete the necessary work, and return the unit to service as soon as possible to support the Island Wide Power System (IWPS).[12]

13. GPA anticipates that the engine will be delivered within 100 days with the installation scheduled for three (3) weeks.[13]

14. In CCU GPA Resolution No. FY2022-28, the Guam Consolidated Commission on Utilities authorized the implementation and completion of the Gas Turbine Exchange project for the Macheche CT through the CT PMC Contract with TEMES, Inc. [14]

ANALYSIS

15. The Administrative Law Judge issued Requests for Information to GPA concerning the Macheche CT on September 9, 2022. See Exhibit "1" attached hereto.

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[10] Id.
[11] Id.
[12] Id.
[13] CCU Commissioners' Board Packet, CCU meeting on August 23, 2022, Issues for Decision [Implementation and Completion of the Turbine Exchange for the Macheche Combustion Turbine Power Plant].
[14] Id.

16. On September 14, 2022, GPA submitted its Responses to the Requests for Information.[15] The Responses are attached hereto as Exhibit "2".

17. In Attachments 2 and 3 to its Responses, GPA provides a "Running Hours breakdown" for the Macheche CT from November 2016 through August 2022. GPA indicates that since 2016, the "run time" hours of the Macheche CT have been substantial, more than 27,000 hours. Over the past year GPA has relied to an even greater extent upon the Macheche CT. Usage was high for the months of February through May of 2022, with totals per month ranging from 279.70 hours up to 693.48 hours. See Exhibit "3" attached hereto.

18. Since 2016, GPA has maximized the use of the refurbished gas turbine. According to Assistant General Manager of Operations Melinda Mafnas, this increased use has resulted from decreased capacity (loss of Cabras 3 & 4), decrease in baseload availability due to forced and unforced outages, and operations necessary to respond to solar intermittency. When more battery storage becomes available and when the new power plant is operational, GPA expects plant usage to decrease.[16]

19. GPA has demonstrated that there is a need to maintain the availability of the Macheche CT until the new power plant is constructed.

[15] Email from Graham Botha, GPA Legal Counsel, to Fred Horecky, PUC ALJ, dated September 14, 2022, with Responses to PUC Request for Information and Four Attachments.
[16] Exhibit "2", GPA Responses to PUC Request for Information, dated September 14, 2022 (prepared by Melinda C. Mafnas P.E.), at Response No. 5.

20. Unless the refurbished gas turbine is installed, and the repairs undertaken, the Macheche unit will only have limited availability for emergency use operation.[17]

21. A borescope inspection of the CT in August 2021 determined that the thermal element of the hot section has been damaged in many places. The hot section components have recently been running over-time, which will lead to damage to the hot section and to the rear LP turbine. For these reasons, the PMC TEMES recommends that a refurbished turbine be installed to prevent catastrophic loss.[18]

22. The HP turbine and LP turbine have serious damages and can no longer be operated safely, according to TEMES.[19]

23. For both safety reasons and for the avoidance of a catastrophic failure, the CT turbine package should be replaced with a fully refurbished gas turbine.[20]

24. The LM2500 turbine manual requires turbine inspection at a minimum of 25,000 hours. When operating hours exceed 27,000 hours, the blades are at risk of breakage.[21]

25. The turbine generator has exceeded the recommended service life of 25,000 hours.[22]

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[17] Guam Consolidated Commission on Utilities GPA Resolution No. FY2022-28, Authorizing the Management of the Guam Power Authority to Implement and Complete the Turbine Exchange for the Macheche Combustion Turbine Power Plant, adopted and approved on August 23, 2022, at p. 1.
[18] Email from Plant Manager of Macheche CT to Melinda C. Mafnas, GPA AGMO, dated August 12, 2022.
[19] Email from Macheche CT Plant Manager to Melinda C. Mafnas, GPA AGMO, dated August 10, 2022.
[20] GPA Responses to PUC Request for Information, dated September 14, 2022 (prepared by Melinda C. Mafnas P.E.), at Response No. 5.
[21] Id.
[22] GPA Petition for Approving the Contract with TEMES, Inc. for Macheche CT Repairs, GPA Docket 22-19, filed September 6, 2022, at p. 1.

26. The Purchase Order/Contract for the Macheche Combustion Turbine with Gas Turbine Investments is attached hereto as Exhibit "4 ". Under the Performance Management Contract, TEMES is responsible for purchase of the CT, and GPA pays for the same as a Performance Improvement Project/Capital Improvement Project under the Performance Management Contract.

27. The ALJ notes that the Macheche turbine engine was replaced previously in November of 2016 at a cost of $2.7M.[23] In the Requests for Information, the ALJ inquired of GPA whether it was "normal, reasonable and ordinary in a power system for a turbine engine to be replaced after 6 years."

28. GPA responded that the requested replacement of the gas turbine was normal, reasonable and ordinary based upon the operating hours. There is already damage to the turbine, the manufacturer General Electric has recommended the replacement of the engine, and the blades are at risk of breakage when operating hours exceed 27,000.[24]

29. Based upon the considerable usage of the Macheche CT over the past 6 years, the ALJ is satisfied that it is reasonable and prudent to replace the existing turbine with a fully refurbished gas turbine and for the undertaking of the repairs specified in the PMC-Gas Turbine Investments Contract.

[23] See PUC Order, GPA Docket 16-11, Petition of the Guam Power Authority for Approval of Macheche CT repairs, dated July 28, 2016.
[24] GPA Responses to PUC Request for Information, dated September 14, 2022 (prepared by Melinda C. Mafnas P.E.), at Response No. 5.

30. The Macheche CT unit is essential to the island wide power system, and the contract is reasonable, prudent and necessary.[25]

RECOMMENDATION

31. The ALJ recommends that the PUC approve the Macheche CT repairs requested in the GPA Petition and the replacement of the existing turbine package with a fully refurbished gas turbine.

32. GPA should be authorized to expend up to the amount of $3,953,417.60, using revenue funds, for the Macheche CT repairs and the refurbished gas turbine.

33. An Order is submitted herewith to the Commissioners for their consideration.

Dated this 17th day of September, 2022.

Frederick J. Horecky
Chief Administrative Law Judge

[25] GPA Petition for Approving the Contract with TEMES, Inc. for Macheche CT Repairs, GPA Docket 22-19, filed September 6, 2022, at p. 2.

BEFORE THE GUAM PUBLIC UTILITIES COMMISSION

IN THE MATTER OF:	)	GPA Docket 22-19
	)	
The Application of the Guam Power Authority for Approving the Contract with TEMES, Inc. for Macheche CT Repairs.	)	PUC REQUESTS FOR INFORMATION

The Guam Public Utilities Commission hereby requests that the Guam Power Authority respond to the following Requests for Information on or before September 13, 2022:

1. A copy of the proposed Contract between TEMES and Gas Turbine Investments.
2. Records indicating the monthly hours of operation of the Macheche CT over the last year.
3. Records indicating the period over which the 26,757 operating hours occurred, and a breakdown of when those hours occurred.
4. The recommendation by TEMES for replacement of the turbine package.
5. PUC previously authorized the replacement of the gas turbine for the Macheche CT on July 28, 2016, in GPA Docket 16-11.
   (a) Is it normal, reasonable and ordinary in the power industry that a gas turbine would have to be replaced after only six years?
   (b) Have turbines been replaced in the other CTs, Dededo and Yigo, and at what frequency?
   (c) Please indicate whether GPA obtained reasonable and expected use from the refurbished gas turbine placed in the Macheche CT in 2016, and the reasons for such conclusion.

Submitted this 9th day of September 9, 2022.

Frederick J. Horecky
Chief Administrative Law Judge

EXHIBIT "1"

GUAM POWER AUTHORITY
ATURIDÅT ILEKTRESEDÅT GUAHAN
P.O.BOX 2977 • AGANA, GUAM U.S.A. 96932-2977

September 14, 2022

MEMORANDUM

TO: Legal Counsel

FROM: AGMO

SUBJECT: Responses to PUC Requests for Information

Macheche CT Engine Exchange

Provided below are the responses to the questions and requests for information submitted by ALJ Horecky.

1. Copy of proposed contract

   See attached file *Attachment 1 - DRAFT TEMES-GTI Contract.pdf*

2. Records of monthly hours of operation

   See attached file *Attachment 2 - Macheche CT 12-month Operational Hours.pdf*

3. Records of operating hours over which the 26,757 hours occurred

   See attached file *Attachment 3 - Macheche Running Hours since 2016 engine exchange.pdf*

4. TEMES recommendation

   See attached file *Attachment 4 - TEMES recommendation.pdf*

5. (a) Is it normal, reasonable, and ordinary in the power system for an engine to be replaced after 6 years

   Engine exchanges are normal, reasonable, and ordinary based on operating hours. The LM2500 manual requires turbine inspection at a minimum of 25,000 hours. Because the inspection normally results in the replacement of thermal components which is an involved process that takes time and resources and is not easy to perform, GE recommends the direct replacement of the engine. Furthermore, because of previous records and experience regarding the Macheche LM2500 unit, when the operating hours exceed 27,000 hours, the blades are at risk of breakage.

EXHIBIT "2"

(b) Have turbines been replaced at other CTs, and at what frequency

Macheche CT	Yigo CT
Hot Section Repair – OCT/1997 Stewart & Stevenson technical services	Hot Section Repair – OCT/1997 Stewart & Stevenson technical services
Engine exchange – NOV/2016 TRI (Turbine resources international) Operating hours 27,989 hours	Engine exchange – JUL/2016 TRI (Turbine resources international)
	Engine exchange – AUG/2021 FS-ES (Field Source-Energy Services)

(c) GPA obtained reasonable and expected use from the refurbished gas turbine placed in the Macheche CT in 2016, and the reasons for such conclusion.

Yes, since 2016, GPA has maximized the use of the refurbished gas turbine. The time frame of replacement compared to the first replacement in 2016, after 23 years and now, after only 6 years is because of the short amount of time it took to reach maximum operational hours. This is attributed to the increase use of Macheche since 2016, as a result of decreased capacity (loss of Cabras 3&4), decrease in baseload availability due to forced and unforced outages, and operations necessary to respond to solar intermittency. In the future, as more battery storage becomes available and when the new power plant is operational, GPA expects plant usage to decrease. Furthermore, the borescope inspection results already show deterioration of the blades. If the blades were to break during operations, this will be catastrophic for the unit.

Please let me know if further information is required.

MELINDA C. MAFNAS, P.E.

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	*Start*
1-Aug-21	0000	0115		1.25	136,511.79	12,479.00	10.94	
	1451	2335		8.73				1
2-Aug-21	1233	2215		9.70	136,904.98	12,632.00	10.84	1
3-Aug-21	1324	2214		8.83	87,306.92	8,673.00	10.07	1
4-Aug-21	0603	2400		17.95	262,291.97	23,025.00	11.39	1
5-Aug-21	0000	2400		24.00	402,994.74	34,691.00	11.62	
6-Aug-21	0000	2303		23.05	404,674.50	34,869.00	11.61	
7-Aug-21	1938	2155		2.28	20,906.05	2,147.00	9.74	1
8-Aug-21	1355	2400		10.08	137,151.76	12,068.00	11.36	1
9-Aug-21	0000	0123		1.38				
	0705	2400		16.92	257,340.54	23,095.00	11.14	1
10-Aug-21	0000	0228		2.47	275,040.62	25,215.00	10.91	
	0522	2400		18.63				1
11-Aug-21	0000	0148		1.80	94,400.42	9,066.00	10.41	
	1726	2400		6.57				1
12-Aug-21	0000	0108		1.13	159,903.95	15,290.00	10.46	
	1052	2320		12.47				1
13-Aug-21	1227	2332		11.08	160,325.60	14,521.00	11.04	1
14-Aug-21	0639	2250		16.18	257,814.73	22,580.00	11.42	1
15-Aug-21	1525	2338		8.22	119,213.49	10,672.00	11.17	1
16-Aug-21	1110	2400		12.83	168,303.88	15,102.00	11.14	1
17-Aug-21	0000	0154		1.90	196,811.76	19,101.00	10.30	
	0701	2227		15.43				1
18-Aug-21	0823	2116		12.88	101,348.79	10,906.00	9.29	1
19-Aug-21	1330	2400		10.50	157,684.94	13,659.00	11.54	1
20-Aug-21	0000	0216		2.27	240,661.96	22,742.00	10.58	
	0605	2400		17.92				1
21-Aug-21	0000	0245		2.75	211,703.20	20,132.00	10.52	
	0810	2400		15.83	211,703.20	20,132.00	10.52	1
22-Aug-21	0000	0143		1.72	173,182.22	16,391.00	10.57	
	1059	2303		12.07				1
23-Aug-21	1056	2400		13.07	154,007.17	14,295.00	10.77	1
24-Aug-21	0000	0133		1.55	273,658.01	24,823.00	11.02	
	0549	2400		18.18				1
25-Aug-21	0000	2400		24.00	369,351.14	32,483.00	11.37	
26-Aug-21	0000	1102		11.03	216,700.38	20,905.00	10.37	
	1530	2307		7.62				1
27-Aug-21	0324	1116		7.87	130,244.67	12,864.00	10.12	1
	1810	2400		5.83				1
28-Aug-21	0000	2400		24.00	416,539.63	35,854.00	11.62	
29-Aug-21	0000	2400		24.00	391,391.11	34,243.00	11.43	
30-Aug-21	0000	2400		24.00	398,678.59	34,502.00	11.56	
31-Aug-21	0000	2400		24.00	359,062.10	31,940.00	11.24	
				493.98	***7083814.81***	***641,097***		***25***

HHV (mbtu/bbl)	5.70
GROSS HEAT RATE (btu/kwh)	***12,282.37***

EXHIBIT "3"

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	*Start*
1-Sep-21	0000	0336		3.60	333,313.89	29,693.00	11.23	
	0455	2400						1
2-Sep-21	0000	2400		24.00	402,561.73	34,905.00	11.53	
3-Sep-21	0000	0207		2.12	170,500.65	16,130.00	10.57	
	1201	2400						1
4-Sep-21	0000	0105		1.08	19,055.72	1,985.00	9.60	
5-Sep-21	1455	2243		7.80	101,119.55	9,337.00	10.83	1
6-Sep-21	0615	2204		15.82	217,792.21	19,901.00	10.94	1
7-Sep-21	1350	1403		0.22	120,012.46	9,247.00	12.98	2
	1603	2304		7.02				1
8-Sep-21	0604	2400		17.93	279,475.45	24,215.00	11.54	1
9-Sep-21	0000	2400		24.00	349,745.61	31,475.00	11.11	
10-Sep-21	0000		1908	19.13	319,808.58	28,101.00	11.38	
11-Sep-21	0708	1009		3.02	165,765.47	15,417.00	10.75	1
	1304	2401		10.95				1
12-Sep-21	1245	2401		11.27	152,500.93	13,902.00	10.97	1
13-Sep-21	0900	2401		15.02	197,569.15	18,245.00	10.83	1
14-Sep-21	1115	2202		10.78	162,370.18	14,749.00	11.01	1
15-Sep-21	1745	2304		5.32	62,595.30	5,950.00	10.52	1
16-Sep-21	1238	2401		11.38	145,576.40	13,171.00	11.05	1
17-Sep-21	1156	2314		11.30	126,738.08	12,251.00	10.35	1
18-Sep-21	1203	2400		11.95	132,735.15	12,701.00	10.45	1
19-Sep-21	0000	0037		0.62	145,408.18	13,568.00	10.72	
	1253	2256		10.05				1
20-Sep-21	1514	2400		8.77	118,311.41	10,505.00	11.26	1
21-Sep-21	0000	0047		0.78	122,445.30	11,610.00	10.55	
	1434	2400		9.43				1
22-Sep-21	0000	0001		0.02	3,342.35	370.00	9.03	
23-Sep-21								
24-Sep-21								
25-Sep-21	0700	0733		0.55	60,233.42	6,175.00	9.75	1
	1655	2307		6.20				1
26-Sep-21	0348	2400		20.20	278,002.01	24,962.00	11.14	1
27-Sep-21	0000	2400		24.00	370,369.78	32,680.00	11.33	
28-Sep-21	0000	2400		24.00	409,525.09	35,361.00	11.58	
29-Sep-21	0000	2348		23.80	301,224.06	28,206.00	10.68	
30-Sep-21	1527	2320		7.88	112,858.08	10,398.00	10.85	1
				350.00	***5380956.19***	***485,210***		***24***
		HHV (mbtu/bbl)			5.70			
		GROSS HEAT RATE (btu/kwh)			***12,237.59***			

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	*Start*
1-Oct-21								
2-Oct-21	1808	2054		2.77	20,131.58	2,269.00	8.87	1
3-Oct-21	1756	2129		3.55	28,909.39	3,132.00	9.23	1
4-Oct-21								
5-Oct-21	0318	2213		18.92	250,705.14	22,929.00	10.93	1
6-Oct-21								
7-Oct-21								
8-Oct-21	1804	2240		4.60	36,090.44	3,942.00	9.16	1
9-Oct-21	1634	2216		5.70	64,458.71	6,217.00	10.37	1
10-Oct-21	1826	2146		3.33	33,766.46	3,389.00	9.96	1
11-Oct-21	1836	1943		1.12	6,545.97	826.00	7.92	1
12-Oct-21	1722	2357		6.58	79,484.98	7,430.00	10.70	1
13-Oct-21	0908	2401		14.88	155,330.43	15,023.00	10.34	1
14-Oct-21	1816	2020		2.07	31,785.06	3,092.00	10.28	1
15-Oct-21	1624	2139		5.25	70,834.07	6,537.00	10.84	1
16-Oct-21								
17-Oct-21								
18-Oct-21	1820	1949		1.48	19,334.52	1,817.00	10.64	1
19-Oct-21	1303	2400		10.95	163,367.57	14,239.00	11.47	1
20-Oct-21	0000	0353		3.88	202,669.70	18,026.00	11.24	
	1334	2157		8.38				1
21-Oct-21								
22-Oct-21								
23-Oct-21								
24-Oct-21								
25-Oct-21								
26-Oct-21	1652	2048		3.93	26,562.31	3,051.00	8.71	1
27-Oct-21	1610	2123		5.22	72,227.64	6,595.00	10.95	1
28-Oct-21	1529	2136		6.12	83,054.19	7,613.00	10.91	1
29-Oct-21	1546	2102		5.27	48,063.95	4,965.00	9.68	1
30-Oct-21								
31-Oct-21								
				114.00	***1393322.11***	***131,092***		***18***

HHV (mbtu/bbl)	5.70
GROSS HEAT RATE (btu/kwh)	***12,768.80***

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	***Start***
1-Nov-21								
2-Nov-21								
3-Nov-21								
4-Nov-21	1548	2018		4.50	29,001.83	3,393.00	8.55	1
5-Nov-21	1652	2012		3.33	23,682.36	2,688.00	8.81	1
6-Nov-21	1515	2020		5.08	33,645.55	3,936.00	8.55	1
7-Nov-21	1432	2038		6.10	46,066.36	5,095.00	9.04	1
8-Nov-21	1551	2042		4.85	41,227.68	4,346.00	9.49	1
9-Nov-21	1317	2116		7.98	90,557.54	10,450.00	8.67	1
10-Nov-21								
11-Nov-21								
12-Nov-21								
13-Nov-21								
14-Nov-21	1432	1944		5.20	55,089.82	5,412.00	10.18	1
15-Nov-21	1616	1740		1.40	7,900.04	972.00	8.13	1
16-Nov-21								
17-Nov-21								
18-Nov-21								
19-Nov-21								
20-Nov-21	1029	1059		0.50				1
	1645	1952		3.12	22,660.33	2,683.00	8.45	1
21-Nov-21								
22-Nov-21								
23-Nov-21								
24-Nov-21								
25-Nov-21								
26-Nov-21								
27-Nov-21								
28-Nov-21								
29-Nov-21								
30-Nov-21								
				42.07	***349831.51***	***38,975***		***10***

HHV (mbtu/bbl)	5.70
GROSS HEAT RATE (btu/kwh)	***15,120.03***

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	*Start*
1-Dec-21								
2-Dec-21								
3-Dec-21								
4-Dec-21								
5-Dec-21								
6-Dec-21								
7-Dec-21								
8-Dec-21								
9-Dec-21	1552	1652		1.00	9,442.07	1,099.00	8.59	1
10-Dec-21								
11-Dec-21								
12-Dec-21								
13-Dec-21								
14-Dec-21								
15-Dec-21	1313	2400		10.78	104,934.61	10,220.00	10.27	1
16-Dec-21	0000	0101		1.02	115,226.40	11,756.00	9.80	
	1250	2400						1
17-Dec-21	0000	0003		0.05	131,458.66	13,480.00	9.75	
	0902	2153		12.85				1
18-Dec-21	0604	2230		16.43	154,536.49	15,837.00	9.76	1
19-Dec-21	1307	2154		8.78	100,789.09	10,007.00	10.07	1
20-Dec-21	0417	2019		16.03	161,768.68	16,157.00	10.01	1
21-Dec-21	1449	2055		6.10	54,597.00	5,676.00	9.62	1
22-Dec-21	1604	2034		4.50	32,067.35	3,640.00	8.81	1
23-Dec-21	1318	2009		6.85	67,598.67	6,790.00	9.96	1
24-Dec-21	1040	2057		10.28	91,217.71	9,467.00	9.64	1
25-Dec-21	1120	2238		11.30	98,230.22	9,560.00	10.28	1
26-Dec-21	1234		1918	6.73	130,656.53	12,050.00	10.84	1
	1945	2400		4.25				1
27-Dec-21	0000	0146		1.77	237,578.94	22,584.00	10.52	
	0521	2407		18.77				1
28-Dec-21	0915	2242		13.45	160,536.84	15,448.00	10.39	1
29-Dec-21								
30-Dec-21	1702	1956		2.90	23,206.51	2,531.00	9.17	1
31-Dec-21								
				153.85	***1673845.77***	***166,302***		***17***
		HHV (mbtu/bbl)			5.70			
		GROSS HEAT RATE (btu/kwh)			***13,483.65***			

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	*Start*
1-Jan-22								
2-Jan-22								
3-Jan-22								
4-Jan-22								
5-Jan-22								
6-Jan-22								
7-Jan-22								
8-Jan-22								
9-Jan-22	1712	2129		4.28	47,179.59	4,689.00	10.06	1
10-Jan-22	1601	2137		5.60	67,293.38	6,363.00	10.58	1
11-Jan-22	1648	2055		4.12	43,046.06	4,258.00	10.11	1
12-Jan-22	0000	0434		4.57	78,414.30	8,822.00	8.89	1
	1655	2111		4.27				1
	2150	2400		2.17				1
13-Jan-22	0000	0236		2.60	60,868.28	6,363.00	9.57	
	1656	2108		4.20				1
14-Jan-22	1600	2057		4.95	39,850.34	4,280.00	9.31	1
15-Jan-22								
16-Jan-22								
17-Jan-22	1832	1952		1.33	5,353.50	704.00	7.60	1
18-Jan-22	1758	2008		2.17	10,632.42	1,313.00	8.10	1
19-Jan-22								
20-Jan-22								
21-Jan-22								
22-Jan-22								
23-Jan-22								
24-Jan-22								
25-Jan-22								
26-Jan-22								
27-Jan-22	1810	2109		2.98	14,418.07	1,835.00	7.86	1
28-Jan-22								
29-Jan-22								
30-Jan-22								
31-Jan-22								
				43.23	***367055.94***	***38,627***		***11***

HHV (mbtu/bbl)	5.70
GROSS HEAT RATE (btu/kwh)	***14,281.84***

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	*Start*
1-Feb-22								
2-Feb-22	1716	2140		4.40	44,948.76	4,455.00	10.09	1
3-Feb-22	1721	2140		4.32	33,881.65	3,553.00	9.54	1
4-Feb-22	1615	2308		6.88	82,332.48	7,737.00	10.64	1
5-Feb-22	1637	2207		5.50	63,684.73	6,086.00	10.46	1
6-Feb-22	1800	2113		3.22	21,886.53	2,488.00	8.80	1
7-Feb-22	0905	2400		14.92	221,648.81	19,388.00	11.43	1
8-Feb-22	0000	0024		0.40	317,399.33	28,129.00	11.28	
	0256		1157	9.02				1
	1215	2400		11.75				1
9-Feb-22	0000	2315		23.25	429,928.27	36,762.00	11.69	
10-Feb-22	0259	2400		21.02	353,857.69	30,383.00	11.65	1
11-Feb-22	0327	2320		19.88	339,388.77	29,536.00	11.49	1
12-Feb-22	1053	2218		11.42	179,211.69	15,677.00	11.43	1
13-Feb-22	0522	2250		17.47	258,226.22	23,017.00	11.22	1
14-Feb-22	1756	2233		4.62	57,460.69	5,360.00	10.72	1
15-Feb-22	0732	2225		14.88	215,208.96	19,299.00	11.15	1
16-Feb-22	1716	2400		6.73	83,622.64	7,459.00	11.21	1
17-Feb-22	0000	0055		0.92	142,385.62	12,533.00	11.36	
	1550	2400		8.17				1
18-Feb-22	0000	2400		24.00	399,261.52	34,688.00	11.51	
19-Feb-22	0000	2400		24.00	380,801.61	33,598.00	11.33	
20-Feb-22	0000	2400		24.00	403,936.10	35,149.00	11.49	
21-Feb-22	0000	2400		24.00	348,788.79	31,270.00	11.15	
22-Feb-22	0000	2400		24.00	377,084.40	32,937.00	11.45	
23-Feb-22	0000	0333		3.55	328,483.18	29,393.00	11.18	
	0521	2400		18.65				1
24-Feb-22	0000	0304		3.07	337,394.20	29,828.00	11.31	
	0537	2400		18.38				1
25-Feb-22	0000	2400		24.00	392,487.43	34,324.00	11.43	
26-Feb-22	0000	2400		24.00	373,518.60	33,019.00	11.31	
27-Feb-22	0000	2400		24.00	340,845.34	30,739.00	11.09	
28-Feb-22	0000	2400		24.00	241,593.27	23,550.00	10.26	
				448.40	***6769267.28***	***600,357***		***18***
		HHV (mbtu/bbl)			5.70			
		GROSS HEAT RATE (btu/kwh)			***12,036.31***			

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	*Start*
1-Mar-22	0000	2400		24.00	254,996.04	24,515.00	10.40	
2-Mar-22	0000	2251		22.85	279,904.37	26,149.00	10.70	
3-Mar-22	0931	2400		14.48	226,581.84	19,831.00	11.43	1
4-Mar-22	0000	2400		24.00	406,288.99	35,012.00	11.60	
5-Mar-22	0000	2400		24.00	409,396.38	35,618.00	11.49	
6-Mar-22	0000	2400		24.00	422,616.48	36,224.00	11.67	
7-Mar-22	0000	2400		24.00	427,415.38	36,533.00	11.70	
8-Mar-22	0000	2400		24.00	428,071.54	36,576.00	11.70	
9-Mar-22	0000	2400		24.00	423,990.84	36,513.00	11.61	
10-Mar-22	0000	1354		13.90	397,393.28	34,431.00	11.54	
	1434	2400		9.43				1
11-Mar-22	0000	2400		24.00	373,750.51	33,090.00	11.29	
12-Mar-22	0000	2400		24.00	388,182.55	33,872.00	11.46	
13-Mar-22	0000	2400		24.00	385,388.23	33,627.00	11.46	
14-Mar-22	0000	2401		24.02	344,205.78	30,837.00	11.16	
15-Mar-22	1004	2400		13.93	168,110.84	15,620.00	10.76	1
16-Mar-22	0000	2400		24.00	403,100.31	34,979.00	11.52	
17-Mar-22	0000	2400		24.00	432,012.68	36,858.00	11.72	
18-Mar-22	0000	2400		24.00	391,713.75	33,999.00	11.52	
19-Mar-22	0000	2400		24.00	350,104.38	30,936.00	11.32	
20-Mar-22	0000		0358	3.97	370,470.45	32,694.00	11.33	
	0455	2400		19.08				1
21-Mar-22	0000	2400		24.00	328,987.39	29,587.00	11.12	
22-Mar-22	0000	2400		24.00	349,723.30	31,004.00	11.28	
23-Mar-22	0000	0223		2.38	207,145.29	18,247.00	11.35	
	1259	2400		11.02				1
24-Mar-22	0000	0107		1.12	165,970.83	14,551.00	11.41	
	1446	2400		9.23				1
25-Mar-22	0000	2400		24.00	365,574.49	32,394.00	11.29	
26-Mar-22	0000	2400		24.00	314,919.72	28,805.00	10.93	
27-Mar-22	0000	0949		9.82	309,781.55	27,368.00	11.32	
	13045	2400		10.25				1
28-Mar-22	0000	2400		24.00	402,035.66	34,872.00	11.53	
29-Mar-22	0000	2400		24.00	381,245.37	33,370.00	11.42	
30-Mar-22	0000	2400		24.00	393,156.41	34,327.00	11.45	
31-Mar-22	0000	2400		24.00	382,781.40	33,754.00	11.34	
				693.48	***10,885,016.03***	***956,193***		***7***
		HHV (mbtu/bbl)			5.70			
		GROSS HEAT RATE (btu/kwh)			***11,921.81***			

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	*Start*
1-Apr-22	0000	2400		24.00	405,092.00	35,270.00	11.49	
2-Apr-22	0000	2400		24.00	325,363.34	29,744.00	10.94	
3-Apr-22	0000	2400		24.00	303,297.95	28,325.00	10.71	
4-Apr-22	0000	2400		24.00	368,967.52	32,764.00	11.26	
5-Apr-22	0000	2400		24.00	386,146.16	33,953.00	11.37	
6-Apr-22	0000	2400		24.00	376,988.15	33,295.00	11.32	
7-Apr-22	0000	2400		24.00	389,425.80	34,232.00	11.38	
8-Apr-22	0000	2400		24.00	408,634.17	35,522.00	11.50	
9-Apr-22	0000	2400		24.00	404,477.96	35,214.00	11.49	
10-Apr-22	0000	2400		24.00	399,678.67	34,693.00	11.52	
11-Apr-22	0000	2400		24.00	312,383.00	28,953.00	10.79	
12-Apr-22	0000	2400		24.00	291,422.64	27,489.00	10.60	
13-Apr-22	0000	0155		1.92	25,454.54	2,814.00	9.05	
	0435		0504	0.48				
14-Apr-22								
15-Apr-22	0620	2400		17.67	281,541.24	24,424.00	11.53	1
16-Apr-22	0000	2400		24.00	358,961.69	31,828.00	11.28	
17-Apr-22	0000	2400		24.00	340,962.45	30,779.00	11.08	
18-Apr-22	0000		1326	13.43	242,251.68	22,489.00	10.77	
	1743	2400		6.28				1
19-Apr-22	0000	0155		1.92	322,951.92	28,913.00	11.17	
	0515	2400		18.75				1
20-Apr-22	0000	2400		24.00	388,467.30	34,087.00	11.40	
21-Apr-22	0000	2400		24.00	399,234.69	34,829.00	11.46	
22-Apr-22	0000	2400		24.00	318,498.84	29,382.00	10.84	
23-Apr-22	0000	0356		3.93	257,039.57	23,133.00	11.11	
	1011	2401		13.83				1
24-Apr-22	1446	2401		9.25	118,625.07	11,031.00	10.75	1
25-Apr-22								
26-Apr-22	0758	2400		16.03	223,174.02	20,224.00	11.04	1
27-Apr-22	0000	2400		24.00	357,523.36	32,024.00	11.16	
28-Apr-22	0000	2400		24.00	391,736.00	34,444.00	11.37	
29-Apr-22	0000	2249		22.82	354,299.73	31,827.00	11.13	
30-Apr-22	1417	2138		7.35	97,947.97	9,043.00	10.83	1
				589.67	***8850547.43***	***790,725***		***7***

HHV (mbtu/bbl)	5.70
GROSS HEAT RATE (btu/kwh)	***12,124.98***

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	*Start*
1-May-22	1559	2400		8.02	105,101.89	9,362.00	11.23	1
2-May-22	0000	2400		24.00	374,221.02	33,255.00	11.25	
3-May-22	0000	0825		8.42	169,111.89	15,962.00	10.59	
	1652	2119		4.45				1
4-May-22	1648	2133		4.75	60,575.21	5,646.00	10.73	1
5-May-22	1433	2400		9.45	130,502.17	11,590.00	11.26	1
6-May-22	0000	0017		0.28	53,353.97	5,358.00	9.96	
	1618		1721	1.05				1
	1951	2400		4.15				1
7-May-22	0000	2400		24.00	354,101.53	31,891.00	11.10	
8-May-22	0000	2400		24.00	350,411.52	31,544.00	11.11	
9-May-22	0000	2400		24.00	396,148.60	34,581.00	11.46	
10-May-22	0000	1019		10.32	297,928.79	26,302.00	11.33	
	1519	2238		7.32				1
11-May-22	1405	2303		8.97	142,399.62	12,572.00	11.33	1
12-May-22	0010	0359		3.82	178,385.77	15,901.00	11.22	1
	1450	2240		7.83				1
13-May-22	1542	2106		5.40	71,629.57	6,624.00	10.81	1
14-May-22								
15-May-22	2115	2400		2.75	23,275.04	2,126.00	10.95	1
16-May-22	0000	2400		24.00	356,755.11	32,065.00	11.13	
17-May-22	0000	2133		21.55	348,790.02	31,042.00	11.24	
18-May-22	1649	2127		4.63	45,090.01	4,586.00	9.83	1
19-May-22	1636	2100		4.40	58,201.71	5,693.00	10.22	1
20-May-22	1740	2119		3.65	35,773.03	3,629.00	9.86	1
21-May-22	1607	2400		7.88	96,951.83	8,755.00	11.07	1
22-May-22	0000	0058		0.97	105,882.63	9,732.00	10.88	
	1605	2246		6.68				1
23-May-22	1609	2400		7.85	113,836.08	9,907.00	11.49	1
24-May-22	0000	0156		1.93	150,932.26	13,482.00	11.20	
	1551	2400		8.15				1
25-May-22	0000	0104		1.07	23,398.91	2,297.00	10.19	
26-May-22								
27-May-22								
28-May-22								
29-May-22	1902	2300		3.97	42,921.95	4,020.00	10.68	1
30-May-22								
31-May-22								
				279.70	***4085680.13***	***367,922***		***20***
		HHV (mbtu/bbl)			5.70			
		GROSS HEAT RATE (btu/kwh)			***12,221.29***			

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	*Start*
1-Jun-22								
2-Jun-22	1740	2022		2.70	26,000.49	2,701.00	9.63	1
3-Jun-22								
4-Jun-22								
5-Jun-22	1630	2234		6.07	93,981.58	8,339.00	11.27	1
6-Jun-22	1652	2157		5.08	54,269.32	5,331.00	10.18	1
7-Jun-22								
8-Jun-22	0929	1338		4.15	60,455.93	6,561.00	9.21	1
	1729	2056		3.45				1
9-Jun-22	0800	1436		6.60	130,915.04	11,749.00	11.14	1
	1758	2024		2.43	130,915.04	11,749.00	11.14	1
10-Jun-22	1744	2036		2.87	18,876.68	2,181.00	8.66	1
11-Jun-22								
12-Jun-22								
13-Jun-22								
14-Jun-22								
15-Jun-22								
16-Jun-22	2119	2322		2.05	18,518.31	1,789.00	10.35	1
17-Jun-22	1718	2045		3.45	38,985.91	3,901.00	9.99	1
18-Jun-22	1705	2228		5.38	60,772.93	5,884.00	10.33	1
19-Jun-22								
20-Jun-22								
21-Jun-22								
22-Jun-22								
23-Jun-22								
24-Jun-22								
25-Jun-22	1709	2210		5.02	60,234.96	5,859.00	10.28	1
26-Jun-22	1641	2400		7.32	75,410.54	7,094.00	10.63	1
27-Jun-22	0000	0142		1.70	22,889.92	2,432.00	9.41	
28-Jun-22								
29-Jun-22								
30-Jun-22	1853	2036		1.72	14,555.98	1,548.00	9.40	1
				59.98	***806782.63***	***77,118***		***14***

HHV (mbtu/bbl)	5.70
GROSS HEAT RATE (btu/kwh)	***12,972.53***

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	*Start*
1-Jul-22	1759	2056		2.95	26,689.78	2,777.00	9.61	1
2-Jul-22	2149	2352		2.05	18,449.95	1,908.00	9.67	1
3-Jul-22								
4-Jul-22								
5-Jul-22								
6-Jul-22								
7-Jul-22								
8-Jul-22								
9-Jul-22								
10-Jul-22								
11-Jul-22								
12-Jul-22								
13-Jul-22								
14-Jul-22								
15-Jul-22								
16-Jul-22								
17-Jul-22								
18-Jul-22	1729	2034		3.08	38,529.17	4,570.00	8.43	1
19-Jul-22	1751	2152		4.02	37,936.12	3,895.00	9.74	1
20-Jul-22	1803	2018		2.25	12,683.78	1,574.00	8.06	1
21-Jul-22								
22-Jul-22	1439	2138		6.98	116,299.58	10,097.00	11.52	1
23-Jul-22								
24-Jul-22	1750	2126		3.60	29,941.42	3,195.00	9.37	1
25-Jul-22								
26-Jul-22								
27-Jul-22	1749	2251		5.03	74,851.18	6,688.00	11.19	1
28-Jul-22	1442	2306		8.40	134,927.11	11,800.00	11.43	1
29-Jul-22	1131	1753		6.37	73,658.29	7,033.00	10.47	1
30-Jul-22	1817	2154		3.62	51,308.65	4,652.00	11.03	1
31-Jul-22	1540	2400		8.33	95,744.48	8,832.00	10.84	1
				56.68	***711019.51***	***67,021***		***12***
		HHV (mbtu/bbl)			5.70			
		GROSS HEAT RATE (btu/kwh)			***12,792.49***			

Date	Start Time	End Timing	Trip Timing	Running hour	Total generation power	Fuel Consumed	Plant Effeciency	*Start*
1-Aug-22	0000	0122		1.37	205,194.63	18,314.00	11.20	
	1156	2400		12.07				1
2-Aug-22	0000	0058		0.97	261,732.92	22,974.00	11.39	
	0848	2400		15.20				1
3-Aug-22	0000	0140		1.67	35,403.13	3,280.00	10.79	
4-Aug-22								
5-Aug-22	1720	2047		3.45	32,904.55	3,384.00	9.72	1
6-Aug-22	1756	2010		2.23	19,696.49	2,077.00	9.48	1
7-Aug-22	1654	2241		5.78	60,942.48	5,917.00	10.30	1
8-Aug-22	1757	2055		2.97	28,613.67	2,900.00	9.87	1
9-Aug-22	1900	2045		1.75	8,601.82	1,017.00	8.46	1
10-Aug-22								
11-Aug-22	1725	2349		6.40	93,112.37	7,977.00	11.67	1
12-Aug-22	1239	2322		10.72	163,996.71	14,697.00	11.16	1
13-Aug-22	1459	2400		9.02	145,269.61	12,547.00	11.58	1
14-Aug-22	0000	2400		24.00	409,503.83	35,434.00	11.56	
15-Aug-22	0000	2400		24.00	415,523.13	35,927.00	11.57	
16-Aug-22	0000	2400		24.00	422,698.95	36,330.00	11.63	
17-Aug-22	0000	2400		24.00	402,264.98	34,908.00	11.52	
18-Aug-22	0000	0916		9.27	292,426.83	25,545.00	11.45	
	1531	2400		8.48				1
19-Aug-22	0000	2400		24.00	370,081.66	32,850.00	11.27	
20-Aug-22	0000	2400		24.00	364,847.75	32,416.00	11.26	
21-Aug-22	0000	0754		7.90	221,898.45	20,256.00	10.95	
	1549	2400		8.18				1
22-Aug-22	0000	1004		10.07	354,867.53	31,643.00	11.21	
	1037	2400		13.38				1
23-Aug-22	0000	0149		1.82	119,766.67	11,247.00	10.65	
	1534	2226		6.87				1
24-Aug-22								
25-Aug-22	1348	2400		10.20	136,106.08	12,157.00	11.20	1
26-Aug-22	0000	0245		2.75	171,626.27	15,903.00	10.79	
	1004	1157		1.88				1
	1547	2400		8.22				1
27-Aug-22	0000	0016		0.27	113,697.81	10,218.00	11.13	
	1615	2400		7.75				1
28-Aug-22	0000	0229		2.48	42,086.20	4,338.00	9.70	
	1353		1503	1.17				1
29-Aug-22								
30-Aug-22								
31-Aug-22								
				318.27	***4892864.52***	***434,256***		***19***

HHV (mbtu/bbl)	5.70
GROSS HEAT RATE (btu/kwh)	***12,045.04***

MCT Units Running Hours breakdown

	Running Hours	STARTS
	11/08/2016 The new engine set up is completed and brought up to 7500 rpm using starting motor yesterday. Unit will fire off for the first time today.	
	1,011.00	(Used)
2016/11	50.37	7
2016/12	145.40	16
Sub. Total	1,206.77	23
Total	1,206.77	23
2017/1		
2017/2		
2017/3	278.83	
2017/4	488.39	
2017/5	607.57	21
2017/6	573.30	22
2017/7	559.82	15
2017/8	674.67	7
2017/9	640.05	11
2017/10	436.55	20
2017/11	408.90	27
2017/12	266.35	23
Sub. Total	4,934.42	146
Total	6,141.19	169

	Running Hours	STARTS
2018/1	187.77	25
2018/2	246.92	30
2018/3	570.82	24
2018/4	460.42	14
2018/5	519.23	16
2018/6	401.15	15
2018/7	356.10	18
2018/8	7.73	4
2018/9	240.17	10
2018/10	528.17	18
2018/11	322.13	12
2018/12	345.62	19
Sub. Total	4,186.22	205
Total	10,327.40	374
2019/1	509.25	16
2019/2	412.62	15
2019/3	432.63	18
2019/4	160.72	17
2019/5	300.02	12
2019/6	512.15	20
2019/7	382.28	27
2019/8	383.75	27
2019/9	458.07	28
2019/10	428.32	30
2019/11	615.93	13
2019/12	402.45	21
Sub. Total	4,998.18	244
Total	15,325.59	618

	Running Hours	STARTS
2020/1	454.97	18
2020/2	274.68	23
2020/3	426.30	22
2020/4	291.02	22
2020/5	469.13	20
2020/6	317.08	28
2020/7	464.48	15
2020/8	209.37	18
2020/9	396.90	27
2020/10	216.23	22
2020/11	299.15	21
2020/12	441.37	21
Sub. Total	4,260.68	257
Total	19,586.27	875
2021/1	341.47	33
2021/2	414.62	25
2021/3	633.98	13
2021/4	575.37	13
2021/5	679.90	8
2021/6	686.43	2
2021/7	556.90	16
2021/8	493.98	25
2021/9	350.00	24
2021/10	115.70	18
2021/11	114.00	18
2021/12	153.85	17
Sub. Total	5,116.20	212
Total	24,702.47	1,087

	Running Hours	STARTS
2022/1	43.23	11
2022/2	448.40	18
2022/3	693.48	7
2022/4	589.67	7
2022/5	279.70	20
2022/6	59.98	14
2022/7	56.68	12
2022/8	318.27	19
2022/9		
2022/10		
2022/11		
2022/12		
Sub. Total	2,489.41	108
Total	27,191.88	1,195

TEMES GPA	**PURCHASE ORDER** TEMES, INC. GPA COMBUSTION TURBINE, DEDEDO, MACHECHE, YIGO PMC MAILING ADDRESS: P.O. Box HL Hagatna, Guam 96932	THIS PURCHASE ORDER NUMBER NO. **CT-498 MCT** MUST APPEAR ON ALL INVOICES, PACKING SLIPS, PACKAGES, B/L, CORRESPONDENCE ETC.
OBJECT CODE: **CIP budget**		DATE: 9/ /2022 PAGE: 1 OF 5

VENDOR	SHIP TO CONSIGNEE, DESTINATION & MARKING
To: GAS TURBINE INVESTMENTS **901 S Corry Field Road, Pensacola, fla, USA 32507** **P.O.C.: Jim Patrick** **Email: Jimp@gasturbineinv.com**	**Guam Power Authority** **Attn: GPA/ TEMES, INC.** **GPA Macheche Combustion Turbine Plant** 420 HARMON LOOP Rd. DEDEDO, GUAM, 96929

MAT. RFQ NO.	QUOTATION NO	CONTACT NO	TIME FOR DELIVERY	EXPIRING	REQUESTED/PREPARED BY:
		T: F:		/ /2023	**TEMES / GPA**

ITEM	ARTICLES OF SERVICES	QTY.	UNIT	UNIT PRICE	AMOUNT	INVENTORY NO.
1	**Low Hour Engine 560-005**	1	Set			
2	**TCT inspection**	1	Lot			
3	**Installation of Gas Turbine**	1	Lot			
4	**Shipping Container**	1	Lot			
5	**Transportation to Guam**	1	Lot			
6	**Performance Test**	1	Lot			
7	**Emissions Test**	1	Lot			
8	**Commissioning (included)**	1	Lot			
9	**72 hour Continuous Operation test (included)**	1	Lot			

SPECIAL INSTRUCTION TO VENDOR: A. DO NOT FILL THIS ORDER IF YOUR TOTAL COST EXCEEDS THIS TOTAL---> INSERT CHANGES AND RETURN THIS ORDER FOR AMENDMENT. B. SEND CERTIFIED ORIGINAL AND THREE (3) COPIES OF INVOICE TO DIVISION OF ACCOUNT. C. PAYMENT UPON RECEIPT OF MERCHANDISE IN GUAM IN GOOD CONDITION. D. THIS ORDER SUBJECT TO CONDITIONS ON NEXT PAGE. E. BID IS SUBJECT TO THE TERMS AND SCOPE IN THE PROPOSAL SUBMITTED F. ON ALL AIR SHIPMENTS, HAVE AIR FRIGHT COMPANY CALL THIS NUMBER UPON ARRIVAL OF GOODS IN GUAM.	**$x,xxx,xxx.00** **↑ TOTAL ↑**

CONTRACTOR: PLEASE SUPPLY PROMPTLY THE ABOVE ARTICLES OR SERVICES. ALL CORRESPONDENCE PERTAINING TO THIS ORDER INCLUDING INVOICES, SHIPPING DOCUMENTS AND PACKAGES MUST BEAR THE PURCHASE ORDER NUMBER SHOWN ABOVE.

SEE NEXT PAGE FOR PURCHASE ORDER TERMS AND CONDITIONS.

Acknowledgment of receipt by Contractor. ***GAS TURBINE INVESTMENTS*** ***SIGNATURE:*** ***Date***	SIGNATURE: Adrain Wu Date Plant Manager

EXHIBIT "4"

TEMES / GPA	**PURCHASE ORDER** TEMES, INC. GPA COMBUSTION TURBINE, DEDEDO, MACHECHE, YIGO PMC MAILING ADDRESS: P.O. Box HL Hagatna, Guam 96932	THIS PURCHASE ORDER NUMBER NO. **CT-498 MCT** MUST APPEAR ON ALL INVOICES, PACKING SLIPS, PACKAGES, B/L, CORRESPONDENCE ETC.
OBJECT CODE: **CIP budget**		DATE: / PAGE: 2 OF 5

VENDOR	SHIP TO CONSIGNEE, DESTINATION & MARKING
To: GAS TURBINE INVESTMENTS **901 S Corry Field Road, Pensacola, fla, USA 32507** **P.O.C.: Jim Patrick** **Email: Jimp@gasturbineinv.com**	**Guam Power Authority** **Attn: GPA/ TEMES, INC.** **GPA Macheche Combustion Turbine Plant** 420 HARMON LOOP Rd. DEDEDO, GUAM, 96929

MAT. RFQ NO.	QUOTATION NO	CONTACT NO	TIME FOR DELIVERY	EXPIRING	REQUESTED/PREPARED BY:
		T: F:		8/31/2021	**TEMES / GPA**

PROCUREMENT CONTACT: Questions concerning this purchase order shall be directed to TEMES CT PMC

LIQUIDATED DAMAGED CLAUSE: Liquid damage in Section 6-101.09.01 of the Guam Procurement Regulation.

NOTE TO VENDORS: A copy of the invoice must be submitted at the time of delivery or services and original must be sent to PMC office P.O. Box HL Hagatna, Guam 96932.

INDEMNIFICATION: Contractor agrees to indemnify and hold harmless TEMES CT PMC, its Directors, Officers, and Employees, from and against any liability, claims, judgements, cost and demands of whatever nature arising from any act, omission or negligence of the Contractor, Subcontractor, Licensees, Agents, or Employees, or arising from any accident, injury or damage whatsoever caused to any person, or to the property of any person, occurring during the term and performance of this contract.

GPA CT PMC WILL NOT BE RESPONSIBLE FOR ANY UNAUTHORIZED SERVICES OVER THE PURCHASE ORDER AMOUNT.

REVIEWED BY:

O&M or Electrical or I&C Manager Date

SPECIAL INSTRUCTION TO VENDOR:	
A. DO NOT FILL THIS ORDER IF YOUR TOTAL COST EXCEEDS THIS TOTAL → INSERT CHANGES AND RETURN THIS ORDER FOR AMENDMENT. B. SEND CERTIFIED ORIGINAL, AND THREE (3) COPIES OF INVOICE TO DIVISION OF ACCOUNT. C. PAYMENT UPON RECEIPT OF MERCHANDISE IN GUAM IN GOOD CONDITION. D. THIS ORDER SUBJECT TO CONDITIONS ON NEXT PAGE. E. THIS ORDER SUBJECT TO THE SPECIAL PROVISIONS, AND BID GENERAL TERMS, AND CONDITIONS SPECIFICED ON THIS BID. F. ON ALL AIR SHIPMENTS, HAVE AIR FRIGHT COMPANY CALL THIS NUMBER UPON ARRIVAL OF GOODS IN GUAM.	**$x,xxx,xxx.00** **↑ TOTAL ↑**

CONTRACTOR: PLEASE SUPPLY PROMPTLY THE ABOVE ARTICLES OR SERVICES. ALL CORRESPONDENCE PERTAINING TO THIS ORDER INCLUDING INVOICES, SHIPPING DOCUMENTS AND PACKAGES MUST BEAR THE PURCHASE ORDER NUMBER SHOWN ABOVE.
SEE NEXT PAGE FOR PURCHASE ORDER TERMS AND CONDITIONS

Acknowledgment of receipt by Contractor.	SIGNATURE:
GAS TURBINE INVESTMENTS ***SIGNATURE:*** ***Date***	Adrain Wu Date Plant Manager

THIS ORDER IS SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS:

1. GAS TURBINE INVESTMENTS ("Seller" or "GTI")
2. GPA/ TEMES, INC. ("Buyer" or "TEMES")
3. Acknowledgment copy of this order must be signed and return advising approximate or definite shipping date.
4. No variation in any of the terms, conditions, deliveries, prices, quantity, quality, or specification, of this order, irrespective of the wording of the Seller's acceptance, will be effective without Buyer's written consent.
5. Packing list must accompany each shipment, showing our order number, description and part/serial number for each item
6. Shipments must be identified as "PARTIAL" OR "COMPLETE".
7. Material is subject to Buyer's inspection and approval within a reasonable time after delivery; if specifications are not met, material shall be returned at Seller's expense.
8. In connection with any prompt payment discount offered, time will be computed from date of delivery and acceptance at destination, or from the date the correct invoice or voucher is received in the office specified by the Government of Guam, if the latter is later than date of delivery and acceptance. Payment is deemed to be made, for the purpose of earning discount, on the date of mailing of the check.
9. Over shipments, unless specifically authorized, will not be accepted.
10. In connection with bid awards and contracts, this purchase order shall be governed by the Special Provisions and Bid General Terms and conditions as specified.
11. Not included in GTI scope is upgrade or repair work on any part of the generator, control system, vibration system, fire protection, water injection system, piping, lube system, air inlet/filtration system, enclosure, or any other component outside of GTI scope, or the supply of any other parts not listed in GTI proposal.
12. Buyer shall provide Seller's Technical Representatives with free and unobstructed access to the site.
13. Buyer shall provide safe and proper working conditions in accordance with all applicable federal, state and local laws, rules and regulations, and shall provide all lifting equipment, reusable parts from existing turbine (eg; liquid fuel nozzles and manifold), access to existing spare parts inventory for Seller's technical representatives to safely install the equipment. Buyer shall be responsible for safe lifting operations and damage to machinery during lifting and installation process. Seller shall provide technical representatives to oversee the lifting process.
14. Buyer shall provide suitable office facilities, convenient to the work site, for Seller's

Technical Representative. Such facilities shall include climate controlled space, lighting, desk, chair, telephone and safe storage space for drawings and necessary tools.

15. GTI will perform a borescope inspection at after 12 months (or 8,000 hours whichever occurs first), and GTI will bear the cost of this borescope inspection. Note that this service is limited to the borescope inspection and does not include any parts/repairs that may be required after the inspection is completed.
16. GTI includes the installation and commissioning of the new turbine. Testing will be done by McHale Performance testing and emissions testing.
17. Typically the testing is 72 hours continuous running test, GTI engineers will remain at site during this period.
18. For any delays caused directly by contractor's scope of supply, contractor will make all reasonable efforts to rectify the schedule. These specifically exclude any delays caused by customer's existing equipment, equipment to be re-used, site availability, or any other reason other than work scope that is directly in GTI control, a penalty of 0.25% per calendar day to a maximum of 15% of contract value equivalent to the work scope portion of the delay if contractor fails to make suitable efforts to remedy the problem.
19. This shall be against clearly definable responsibilities as sole and exclusive remedy and only for delays caused by equipment we are proposing to sell and install. Liability or damages due to existing equipment or delays caused outside of our scope by any equipment not provided by us, is not the responsibility of GTI. No incidental or consequential other damages are considered.
20. GTI delivers to Guam Port but TEMES/ GPA must do the customs clearance/import of the 560-005 Engine and deliver it to Macheche CT Power Plant station where GTI people will perform the installation and commissioning and testing.
21. The rights and obligations of the parties under the Agreement shall be governed by and construed in accordance with the laws of the Guam USA.
22. Payment terms

    22.1 Pay 10% of the total contract price with order placement.
    (After receiving the Commercial Invoice, wire transfer within 7 working days)

    22.2 Pay 40% of the total contract price, after receipt of shipping
    - Shipping documents-Bill of lading, packing list, Invoice.

- "Engine Shop Visit Report" provided by GE license factory or GE Service Center. (Including Engine test report, Outgoing Report, Recorded Modification Sheet)

22.3 Pay 30% of the total contract price, after new engine arrives at the Macheche Power Plant.

22.4 Pay 10% of the total contract price upon completion of 72 hour run test.

- The PI 456-906 engine of shipping return to the contractor.
- Provide a copy of the bill of lading.

22.5 Pay 10% of the total contract price, after upon completion of performance test and emissions test and final report. (Any oil sampling testing and analysis are included in total contract price.)

9.0 The zero hour turbine exchange for Macheche CT plant Rev.3a Quoation Form

Item	Description	Quantity	unit	Unit Price	Subtotal	Remarks
1A	The overhauled or refurbished zero-hour LM2500 SAC Engine Exchange	1	lots	N/A	N/A	N/A
	- Fully refurbished Gas Turbine			N/A	N/A	N/A
	-Includes all Campaign and Alert Service Bulletins complied with at the time of the overhaul.			N/A	N/A	N/A
	- All new or refurbished blades, vanes and shrouds			N/a	N/A	N/A
	- Including the installation of brand new or overhauled liquid fuel/ water injection nozzles and manifolds on the engine. (The minimum required fuel nozzles must be replaces)			N/A	N/A	N/A
	- Including the installation of one all set of Hydraulic Starting motors and pipelines.			N/A	N/A	N/A
	-Including the installation of all set (AI and CR) individual T5.4 thermocouple to Junction Box 35			N/A	N/A	N/A
	-The Engine warranty			N/A	N/A	N/A
	-Free borescope inspection – 12 months after first use.			N/A	N/A	N/A
1B	The Low-hour LM2500 SAC Engine Exchange include.	1	lots	N/A	$2,550,000.00	
	- The Low-hour engine was last overhauled at GE Service Center or factory with GE license.			included in price		
	- Including the installation of brand new or overhauled liquid fuel/ water injection nozzles and manifolds on the engine. (The minimum required fuel nozzles must be replaces)			included in price		
	- Including the installation of one all set of Hydraulic Starting motors and pipelines.			included in price		
	-Including the installation of all set (AI and CR) individual T5.4 thermocouple to Junction Box 35			New T5.4 system	$75,000.00	new system
	-Borescope inspection at facility (GE licensee or GE Service Center)			included in price		
	-The Engine warranty			included in price		
	-Free borescope inspection – 12 months after first use.			included in price		
2	The spare parts required for turbine exchange, please see Specification 3.7 item and attachment 4	1	lots	$60,000.00	$60,000.00	Minimum requirement
3	Secondary Flow Fuel Tube (Part Number: 1.46466G01)	30	EA	300	$9,000.00	For the owner as additional spare parts
4	Primary Flow Fuel Tube (Part Number: 1.46380G01)	30	EA	300	$9,000.00	For the owner as additional spare parts
5	The commissioning and 48 hours of continuous business test.	1	lots	included in price		
6	Engine Exchange tooling and consumables	1	lots	Temes to supply engine exchnage tooling. Consumables?		
7	The Performance test and final report. (Any oil sampling testing and analysis are included in total contract price.)	1	lots	Included in price		
8	The emission test and final report.	1	lots	included in price		
9	Shipping of the zero-hour engine to Macheche CT	1	lots	included in price		door-to-door
10	The return of Macheche engine ESN 560-012 to the contractor	1	lots	included in price		
11	The ESN 560-012 engine Shipping costs	1	lots	included in the price		
12	The return of PI 456-906 engine with sipping container	1	lots	does GTI receve this core as well		
13	The PI 456-906 engine Shipping costs	1	lots	does GTI receve this core as well?		
14	Field Service Support for removal and installation of the LM2500 SAC Gas Turbine	1	lots	included in the price		
15	Round-trip air tickets, accommodation, vehicles and meals	1	lots	$52,500	$52,500	
	TOTAL				$2,755,500.00	USD

Remarks:
1. If Engine on item 8 is damaged before shipping out, then the price shall be the same as item 10 (please refer to scope 3.14 and 3.15)
2. Turbine exchange can choose 1A item or 1B item.
3. The final decision of Macheche engine ESN 560-012 belongs to the Owner.

b第 1 頁 (共 2 頁)(B)

ct_mechanical.mgr

寄件者: "Jim Patrick" <jimp@gasturbineinv.com>
日期: 2022年6月25日 下午 07:10
收件者: "ct_mechanical.mgr" <ct_mechanical.mgr@temcs.com.tw>
主旨: Re: GE LM 2500 560-008 PT & GE LM 2500 PI GG 560-005

Dear Fred , so we have to go back to GE Depot Monday morning to request the original full 85 page report . I also am released from doctors to fly out Sunday Arrive Guam Monday 6 pm . I know it's after the opening bid times but I'm
Not concerned with that . I am wanting to go thru our complete quote thou . With the supply of the GE report and the fact we will use a GE authorize shop such as TCT , please note they will
Also supply a current GE report as we are spending $1 million +- on the engine check out and retest.
Having said that, would we still qualify in the bid and if so I will
Make the trip To Guam Leaving my Sunday
Arriving your Monday 27 th 6 pm . If you will
Be kind enough to comment me your thoughts I would greatly appreciate it It's 4 am here but I am
Up for the morning and Needing to book
Flight if we still qualify for the bid , the flights are very expensive last minute but I am released to fly now Regards please Jim

Invitation for bid (The turbine exchange for Macheche CT plant)- The Third Time

Bid Confirmation Checklist

Item	Invitation to Bid Specification Requirements	Please Confirm		TEMES PMC Treatment
		AGREE	Disagree	
3.1	The overhauled or refurbished zero-hour LM2500 SAC Engine Exchange include. (GG+PT)	N/A		Bidders can choose either Item 3.1 or Item 3.2
-	Overhauled for this engine by GE licensee facility or GE Service Center. **(Bidders are requested to provide supporting documents.)**	N/A		**If disagree, you will be rejected.**
-	**Engine Number:**	N/A		
-	Including the installation of **brand new or overhauled liquid fuel/ water injection nozzles and manifolds** on the engine.	N/A		
-	If the liquid fuel system is to be reused, the **contractor must replace the liquid fuel/ water injection nozzles and fuel support brackets.**	N/A		**If disagree, TEMES PMC has the right to deduct the contract payment of USD 150,000.00**
-	Including the installation of one all set of Hydraulic Starting motors and pipelines. **(Refurbished or Overhauled or Brand New)**	N/A		
-	If the Hydraulic Starting motors and pipelines is to be reused, the **contractor must replace the Hydraulic Starting motors.**	N/A		**If disagree, TEMES PMC has the right to deduct the contract payment of USD 20,000.00**
-	Including the installation of all set (AI and CR) individual T5.4 thermocouple to Junction Box 35.	N/A		
-	TEMES PMC make an instrument list for bidders reference. Bidder must compare with the list, and ensure their supplies are suitable for our existing connector/wiring, or piping, it's important that bidder's turbine need to own all components as the list shows(cable & connector are except) if they can couple with our existing conditions(no need to change connector, wiring, piping) we will follow the bidder's supplies, no limit they are as same as the list's models.	N/A		**If disagree, you will be rejected.**
-	The Engine warranty 15 months from the date of completed commissioning or 8,000 hours of operation from first use, whichever occurs first.	N/A		
3.2	The Low-hour gas turbine engine operation is defined as engine operating hours less than 2,000 hours (on natural gas and liquid fuel oil) (GG+PT)	X		Bidders can choose either Item 3.1 or Item 3.2
-	The Low-hour engine was last overhauled at GE Service Center or factory with GE license. **(Bidders are requested to provide supporting documents.)**	X		**If disagree, you will be rejected.**
-	**Engine Number:** *560-005.GG & 560-009 PT*	X		

Bidder's Signature:

Invitation for bid (The turbine exchange for Macheche CT plant)- The Third Time

Bid Confirmation Checklist

Item	Invitation to Bid Specification Requirements	Please Confirm		TEMES PMC Treatment
		AGREE	Disagree	
-	**Engine Running Hours:** *720 hours on GG. 1307 hour on PT*	X		
-	**Including the installation of brand new or overhauled liquid fuel/ water injection nozzles and manifolds on the engine.**	X		
-	**If the liquid fuel system is to be reused, the contractor must replace the liquid fuel/ water injection nozzles and fuel support brackets.**	X		**If disagree, TEMES PMC has the right to deduct the contract payment of USD 150,000.00**
-	**Including the installation of one all set of Hydraulic Starting motors and pipelines. (Refurbished or Overhauled or Brand New)**	X		
-	**If the Hydraulic Starting motors and pipelines is to be reused, the contractor must replace the Hydraulic Starting motors.**	X		**If disagree, TEMES PMC has the right to deduct the contract payment of USD 20,000.00**
-	Including the installation of all set (AI and CR) individual T5.4 thermocouple to Junction Box 35.	X		
-	TEMES PMC make an instrument list for bidders reference. Bidder must compare with the list, and ensure their supplies are suitable for our existing connector/wiring, or piping, it's important that bidder's turbine need to own all components as the list shows(cable & connector are except) if they can couple with our existing conditions(no need to change connector, wiring, piping) we will follow the bidder's supplies, no limit they are as same as the list's models.	X		**If disagree, you will be rejected.**
-	The Low-hour gas turbine to the facility (GE licensee or GE Service Center) where it will be put on the test stand and run to confirm its performance prior to shipping the turbine to Guam. This is reduce the risk of any issues arising once the turbine is installed at Macheche plant. This is included in the total contract	X		
-	Contractors must before shipping Guam to do Borescope Inspection of Low-hour gas turbine at facility (GE licensee or GE Service Center). This is included in the total contract price.	X		
-	The Engine warranty 15 months from the date of completed commissioning or 8,000 hours of operation from first use, whichever occurs first. GTI offers 18 months 10,000 hour	X		
3.6	Replacement of all gasket or packing or O-ring and bolts/ nuts.	X		

Bidder's Signature:

Invitation for bid (The turbine exchange for Macheche CT plant)- The Third Time

Bid Confirmation Checklist

Item	Invitation to Bid Specification Requirements	Please Confirm		TEMES PMC Treatment
		AGREE	Disagree	
3.7	The contractor shall provide the spare parts required for turbine exchange; it was shown in the attachment 4 list which may include but are not limited to. This is the minimum requirement and the contractor should use professional judgment to add additional spare parts to meet this turbine exchange project. The remaining spare parts belong to the owner.	X		If disagree, TEMES PMC has the right to deduct the contract payment of USD 60,000.00
	The contractor must provide 30 pcs new fuel secondary flow tubes (Part Number: L46466G01) for the owner as additional spare parts. The price of which is included in the total price quotation.	X		If disagree, TEMES PMC has the right to deduct the contract payment of USD 29,000.00
	The contractor must provide 30 pcs new fuel primary flow tubes (Part Number: L46380G01) for the owner as additional spare parts. The price of which is included in the total price quotation.	X		If disagree, TEMES PMC has the right to deduct the contract payment of USD 28,000.00
3.8	The variable stator vane (VSV) tracking and adjusts to ensure that VSV schedule is in limits in operating region. The contractor needs to provide adjustment data to owner.	X		If disagree, you will be rejected.
3.9	When the VSV schedule is completed and the new engine continues to operate for 4 hours after the output of 20MW, the commissioning is declared complete.	X		If disagree, you will be rejected.
3.10	48 hours of continuous business test.	X		
3.11	Indicative Performance & emission test is included in the total contract price. (On site test)	X		If disagree, TEMES PMC has the right to deduct the contract payment of USD 150,000.00
3.12	Free borescope inspection – 12 months after first use.	X		If disagree, TEMES PMC has the right to deduct the contract payment of USD 30,000.00
3.13	Shipping of the zero-hour or low-hour engine to Macheche power plant in Guam (door-to-door) is included in the total contract	X		
3.14	The return of Macheche engine ESN 560-012 to the contractor is included in the total contract price.	X		
3.15	If the Macheche engine ESN 560-012 happen to be damaged before the gas turbine is exchanged, it must return to the same price as the PI 456-906 engine.	X		
3.17	The return of PI 456-906 engine with shipping container to the contractor is included in the total contract price.	X		

Bidder's Signature:

Invitation for bid (The turbine exchange for Macheche CT plant)- The Third Time

Bid Confirmation Checklist

Item	Invitation to Bid Specification Requirements	Please Confirm		TEMES PMC Treatment
		AGREE	Disagree	
4.1	LM2500 certified zero-hour or Low-hour gas turbine engine lead time –shipped to the Macheche CT power plant 100 days after the award of the P.O.	X		

Bidder's Signature:

Invitation for bid (The turbine exchange for Macheche CT plant)- The Third Time

Quotation Confirmation Checklist

Item	Invitation to Bid Specification Requirements	Please Confirm		Treatment
		AGREE	Disagree	
1	Quote Validity : 6 months. Because the budget has to wait for the approval of CCU and PUC, TEMES receives the P.O. of GPA.	X		
2	The owner requested to keep the Macheche CT engine (560-012).	X		
3	PI 456-908 engine as the engine for this exchange.	X		
4A	Please assist in moving the 456-908 Yigo engine out of the our shipping container and shipping 456-908 Yigo engine back to GTI. Please loading the 560-012 Macheche engine into the our shipping container.	X		
4B	Shipping the 456-908 Yigo engine with container back to GTI, Please loading the 560-012 Macheche engine into the new engine container.	X		
5	Qualified I&C Technical Advisory must be available to remove and install I&C on the engine.	X		
6	TEMES only provides existing engine-specific tools. The remaining hard tools, spreaders and consumables are provided by GTI.	X		

PIP/ CIP Item for Macheche CT Power Plant

CIP Project : The turbine exchange for Macheche CT plant

(2022)

SPECIFICATIONS

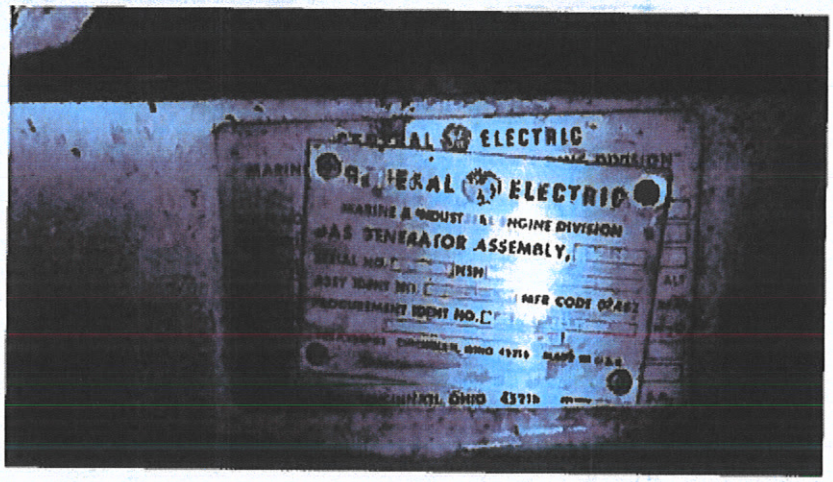
May Rev.3a

TAIWAN ELECTRICAL AND MECHANICAL ENGINEERING SERVICES, INC.

(TEMES/GPA)

1.0 Project Description

The Macheche CT power plant consists of one (1) GE LM2500 combustion turbine generator ESN **560-012** (CTG) with water injection running on liquid fuel. The engine of the unit was replaced with a refurbished LM2500 turbine on November 8th 2016. The ESN **560-012** engine has a record running time of 25,434 hours on March 15, 2022, and is now operating normally. **(The engine ESN 481-656 was first installed at the Macheche power plant in 1993.)**



The Macheche turbine exchange program is to exchange the existing ESN **560-012** engine and PI 456-906 engine together for a zero-hour or **Low-hour** gas turbine.

The ESN **560-012** engine most recent Borescope Inspection is on August 7, 2021. Please see attachment 1.

The GE LM2500 PI 456-906 engine was exchanged on June 26, 2016, failed on May 14, 2021, the total operating hours was 19,499 hours, did a Borescope inspection on June 8, 2021, and is now board stored in shipping containers at GPA Cabras warehouse. Please see attachment 2 and 3.

We are looking for a **turnkey provider**, including LM2500 certified zero-hour **or low-hour** gas turbine engine, transportation, exchange of construction and tools, consumables, parts replacement…etc.

Low-hour gas turbine engine operation is defined as engine operating hours less than 2,000 hours (on natural gas and liquid fuel oil)

2.0 Contractor's Responsibility

2.1 Offerors should visit the site and be responsible for having ascertained pertinent conditions such as location, accessibility, and general character of the site or building, the character and extent of existing work within or adjacent to the site, and any other work being performed thereon at the time of the submission of their bids. No extra compensation will be made by reason of any misunderstanding or error as regards to the site, the conditions thereof, accessibility or the amount of kind of work to be performed.

2.2 Required Manpower like certified Technicians, Special Fitters, Grinder, Riggers, and Semi- Skilled Workers, Welders etc. to complete this project.

2.3 The contractor shall provide all tooling required to perform this project, and provide adequate PPE (Personnel Protection Equipment), and safety training/briefings for all his personnel working in the Plant.

2.4 Contractor shall hire its own safety officer to supervise the site working area to ensure all site activities are performed in accordance with safe working practices and in compliance with OSHA and local law requirements. With assistance from TEMES, the hot work permit for site welding must apply thru GPA safety department and approved by GPA safety officer before proceeding any grinding and welding jobs. GPA does have a safety department, which may advise the Contractor on the required safety procedures before and during the project.

2.5 The contractor shall provide Mobile crane, and certified Mobile Crane Operators /Fork Lift Operators.

~~2.6 Although the owner has mobile cranes and forklift, there is no guarantee that they can be used in time.~~

2.7 To & from Local Travelling, Lodging and Boarding of their staff and workers from work site to their place of stay.

2.8 The individual entering Guam may be subject to quarantine at a government facility or the specified hotel until further notice, the quarantine standby expense should be included in the CONTRACTOR's price proposal. In the event quarantine is lifted, price will be removed from the proposal.

2.9 The CONTRACTOR must consider the risk of COVID-19 in this bid, no extra compensation will be made by reason of

COVID-19.

2.10 The CONTRACTOR must assign his employees who had at least 2 dose of COVID-19 vaccine to site to perform the turbine exchange works.

2.11 Contractors should bring their own infrared thermometers. Before entering the power plant, contractors must measure their body temperature and confirm their normal health before entering the work.

2.12 The contractor workers must wear masks at all times.

3.0 Scopes of work

Contractor to provide overhauled or refurbished zero-hour **or low-hour** LM2500 SAC gas turbine engines to be overhauled for this engine by GE licensee **facility or GE Service Center** and to provide all service and maintenance records.

The overhauled or refurbished zero-hour LM2500 SAC Engine Exchange works cope is in accordance with the original equipment manufacturers (OEM) Industrial Repair Manual (IRM) work instructions and/or OEM engineering shop procedures and compliant with the latest version of GE LM2500 bulletin.

3.1 The overhauled or refurbished zero-hour LM2500 SAC Engine Exchange include.

- Fully refurbished Gas Turbine
- Includes all Campaign and Alert Service Bulletins complied with at the time of the overhaul.
- All new or refurbished blades, vanes and shrouds
- Including the installation of brand new or overhauled liquid fuel/ water injection nozzles and manifolds on the engine.
- Including the installation of one all set of Hydraulic Starting motors and pipelines. (Refurbished or Overhauled or Brand New)
- Including the installation of all set (AI and CR) individual T5.4 thermocouple to Junction Box 35.
- The Engine warranty **15 months from the date of**

completed commissioning or 8,000 hours of operation from first use, whichever occurs first.

3.2 **The Low-hour LM2500 SAC Engine Exchange include.**

- **The Low-hour engine was last overhauled at GE Service Center or factory with GE license.**
- **Including the installation of one all set of Hydraulic Starting motors and pipelines.**
- **Including the installation of brand new or overhauled liquid fuel/ water injection nozzles and manifolds on the engine.**
- **Including the installation of all set (AI and CR) individual T5.4 thermocouple to Junction Box 35.**
- **The Engine warranty 15 months from the date of completed commissioning or 8,000 hours of operation from first use, whichever occurs first.**
- **The Low-hour gas turbine to the facility (GE licensee or GE Service Center) where it will be put on the test stand and run to confirm its performance prior to shipping the turbine to Guam. This is reduce the risk of any issues arising once the turbine is installed at Macheche plant. This is included in the total contract price.**
- **Contractors must before shipping Guam to do Borescope Inspection of Low-hour gas turbine at facility (GE licensee or GE Service Center) ~~or on-site~~. This is included in the total contract price.**

3.3 Contractor's Qualified Technical Advisors will perform the removal and installation of the LM2500 SAC Gas Turbine from the enclosure in accordance with (IAW) GEK 97310, Volume II, WP 300 00.

3.4 Scope of work includes the removal and installation from a standard LM2500 package using package hoist and external H-Frame assembly only.

3.5 Contractor shall provide the following resources to carry out the scope of work

- Provision of two (2) or three (3) Qualified Technical Advisors for working eight (8) hours per day.
- Provision of two (2) or four (4) Craft Labor for working eight (8) hours per day.
- Engine Exchange tooling and consumables.

3.6 Replacement of all gasket or packing or O-ring and bolts/ nuts.

3.7 The contractor shall provide the spare parts required for turbine exchange; it was shown in the **attachment 4** list which may include but **are not limited to**. This is the minimum requirement and the contractor should use professional judgment to add additional spare parts to meet this turbine exchange project. **The remaining spare parts belong to the owner.**

- **The contractor must provide 30 pcs new fuel secondary flow tubes (Part Number: L46466G01) for the owner as additional spare parts. The price of which is included in the total price quotation.**
- **The contractor must provide 30 pcs new fuel primary flow tubes (Part Number: L46380G01) for the owner as additional spare parts. The price of which is included in the total price quotation.**

3.8 The variable stator vane (VSV) tracking and adjusts to ensure that VSV schedule is in limits in operating region. The contractor needs to provide adjustment data to owner.

3.9 When the VSV schedule is completed and the new engine continues to operate for 4 hours after the output of 20MW, the commissioning is declared complete.

3.10 **48** hours of continuous business test.

3.11 Indicative Performance & emission test is included in the total contract price. **(On site test)**

The company information is as follows: (for reference only)

- **Emission test**

  TRC Environmental Corporation (TRC)

  Contact: Matthew Ellis

Contact number: +1671-488-1823

Email address: MEllis@trccompanies.com

- **Performance test**

McHale & Associates, Inc.

Contact: Gerben Baalbergen; Davis Wilson

Contact number: +1 865 588 2654

Email address: gerben.baalbergen@mchale.com

wilson.davis@mchale.com

3.12 Free borescope inspection – 12 months after first use.

3.13 Shipping of the zero-hour **or low-hour** engine to Macheche power plant in Guam (door-to-door) is included in the total contract price.

3.14 The return of Macheche engine ESN **560-012** to the contractor is included in the total contract price.

3.15 If the Macheche engine ESN **560-012** happen to be damaged before the gas turbine is exchanged, it must return to the same price as the PI 456-906 engine.

3.16 The final decision of Macheche engine ESN 560-012 belongs to the Owner.

3.17 The return of PI 456-906 engine with shipping container to the contractor is included in the total contract price.

4.0 Project schedule

4.1 LM2500 certified zero-hour **or Low-hour** gas turbine engine lead time –shipped to the Macheche CT power plant **100** days after the award of the **P.O.**

4.2 The installation of the new engine and the completion of the commissioning will be completed on the 14th day after receiving the notice from the owner.

4.3 Due to the shortage of electricity in Guam, the contractor needs to cooperate with the schedule of the dispatch center to do Performance & emission tests. The waiting schedule is included in the total contract price, and the owner does not pay

any delay fee.

5.0 Liquidated Damages term

5.1 For any delays caused directly by contractor's scope of supply, a penalty of 0.5% per calendar day to a maximum of 15% of contract value equivalent. This terms are only suitable for 4.1 items.

5.2 These specifically exclude any delays caused by owner's existing equipment, equipment to be re-used, site availability, or any other reason other than work scope that is directly in contractor control, a penalty of 0.25% per calendar day to a maximum of 10% of contract value equivalent to the work scope portion of the delay if contractor fails to make suitable efforts to remedy the problem. This terms are only suitable for 4.2 & 4.3 items.

5.3 The maximum limit of liquidated damages for item 5.1 plus item 5.2 is 30% of total contract price.

6.0 Payment terms by TEMES via wire transfer to the contactors' bank

6.1 Pay 10% of the total contract price with order placement.

6.2 Pay 40% of the total contract price, after receipt of shipping documents and "Engine Shop Visit Report".

- Shipping documents-Bill of lading, packing list, Invoice.
- "Engine Shop Visit Report" provided by GE license factory **or GE Service Center**. (Including Engine test report, Outgoing Report, Recorded Modification Sheet)

6.3 Pay 30% of the total contract price, after new engine arrives at the Macheche Power Plant.

6.4 Pay 10% of the total contract price upon completion of 72 hour run test.

- The PI 456-906 engine and ESN **560-012** engine of shipping return to the contractor.
- Provide a copy of the bill of lading.

6.5 Pay 10% of the total contract price, after upon completion of performance test and emissions test and final report. (Any oil sampling testing and analysis are included in total contract

price.)

7.0 Receipt and Price Proposals Opening

7.1 The bid shall be submitted in sealed either hand carried or express mail (Fedex or DHL) or Email to TEMES CTPMC Mr. Fred Lee, Physical address: GPA Dededo CT Power Plant, 523 East Marine Corp. Drive Route 1, GU 96929, no later than **12:00 P.M. June 23, 2022** (Guam time).

7.2 The price proposals received by TEMES shall be in a sealed envelope no later than the specified date and time. Any late submittals will be rejected and disqualified.

7.3 The bid will be publicly opened at GPA Generation Admin Conference Room located at Cabras Power Plant. (NO. 322 Cabras Hwy, Route 11, Piti, Guam 96915) on **June 24, 2022, 09:00 AM.** One (1) Personnel per Prospective Bidder is invited to attend public opening.

7.4 MODIFICATIONS PRIOR TO DATE SET FOR OPENING BIDS, The right is reserved, as the interest of the TEMES/GPA may require to revise the specifications or drawings or both prior to the date set for opening bids. The addendum will include an announcement of the new date for opening bids.

7.5 CUT-OFF DATE FOR RECEIPT OF QUESTIONS: **16:00 P.M. June 17, 2022** (Guam time).

7.6 RIGHT TO ACCEPT AND REJECT BIDS

7.6.1 TEMES reserves the unqualified right, in its sole and absolute discretion, to reject any and all bids, or to accept that bid or combination of bids, if any, which in its sole and absolute judgment will under all circumstances best serve the Guam Power Authority's interests. Any effort by a BIDDER to influence TEMES in the proposal evaluation, proposal comparison or contract award decisions may result in the rejection of the proposal.

7.6.2 The bidder's proposal must provide the LM2500 engine serial number and the maintenance factory certificate with GE license **or GE Service Center**. This proposal must be separated from the quotation

proposal and clearly marked on the outside.

7.6.3 The factory without GE **Service Center** or without GE license will cause the proposal to be rejected.

7.6.4 The bidder needs to provide a copy of the GE license certificate. If not provided it will be rejected.

7.6.5 The bidders must provide on-site performance test and emission test price. If not provided it will be rejected.

7.6.6 Proposals for quotations must be separated and sealed and should be clearly marked on the outside. Quotations are always in US dollars.

8.0 General Requirement

8.1 Protection of Work, Property and Personnel

The CONTRACTOR shall safely guard the Owner's property from damage or loss in connection with this contract all the time. He shall safely guard and protect his own work and that of adjacent property (as provided by law and the contract documents) from damage. All passageways, guard fences, lights and other facilities required for protection by laws and regulations and local conditions must be provided and maintained.

CONTRACTOR shall be responsible for all materials received from the Owner and shall safeguard Owner materials from damage and/or theft.

All materials and work covered by partial payments made shall thereupon become the sole property of the Owner. The materials on site shall remain the responsibility of the CONTRACTOR and any material lost due to theft or damage shall be replaced by the CONTRACTOR. Excess materials shall be turned over to TEMES and/or the Owner after the completion of the project.

8.2 Accident Prevention

Precaution shall be exercised at all times for the protection of persons (including employees) and property. The safety provisions of applicable laws, building and construction codes shall be observed. Machinery equipment and all hazards shall

be observed. Machinery equipment and all hazards shall be guarded or eliminated in accordance with the safety provisions of the latest edition of the Manual of Accident Prevention in Construction published by the Associated General Contractors of America to the extent that such provisions are not in contravention of applicable laws.

The CONTRACTOR shall comply with all safety regulations and OSHA standards regarding Confined Space Entry. He shall be responsible for securing and providing entry permits for such spaces. Should typhoon warnings be issued, the CONTRACTOR shall take every practicable precaution to minimize damage and/or danger to persons, to the work, and to the adjacent property. These precautions shall include closing all openings, removing all loose materials, tools and/or equipment from exposed locations, and removing or securing scaffolding and all other temporary work.

8.3 Restoration of Property Damages

Any property damages to private and public properties, buildings, equipment, or utilities during the course of the work shall be restored to its original condition at no expense to TEMES/GPA.

Any temporary modifications made by the CONTRACTOR for access of temporary piping and installation of equipment like cutting of gratings shall be restored by the CONTRACTOR to its original condition. The CONTRACTOR shall remove all temporary supports after the completion of the work and all burned surfaces due to oxy-acetylene cutting shall be cleaned and painted.

8.4 Mutual Responsibility of CONTRACTORs

If the CONTRACTOR or any of subcontractors or employees causes loss or damage to any separate contractors on the work, the CONTRACTOR has to settle with such separate contractors by agreement. If such separate contractors sues the TEMES or Owner on account of any loss so sustained, the TEMES or Owner shall notify the CONTRACTOR who shall indemnify and save harmless the TEMES or Owner against any expenses or judgment arising there from.

8.5 Engineering Safety

8.5.1 The CONTRACTOR shall hire its own safety officer to supervise the site working area to ensure all site activities are performed in accordance with safe working practices and in compliance with OSHA and local law requirements. Hot work permit for site welding and Confine space entry permit must apply thru GPA safety department and approved by GPA safety officer before proceeding any hot touching jobs. Due to the location of the work the CONTRACTOR must exercise safety precautions and keep the area clean from falling debris to lower elevations which create hazard for TEMES or GPA personnel or other inspecting individuals. GPA does have a safety department, which may advise the CONTRACTOR on the required safety procedures before and during the project.

8.5.2 The CONTRACTOR shall organize and manage its workplace so that placement and location of materials, parts, tools and equipment will minimize the interference to the public and GPA employees.

8.5.3 General Precautions

At all times when performing work on this project the following general practices should be observed.

- Remove and tag out electrical power from all systems/circuits upon which work is to be performed.
- Remove the instruments before Turbine disassembly.

8.6 Standard

Any material, working procedure or method shell be comply with manufacturer's specific standard, instruction manual criteria and other standard such as a commercial standard, a Federal specification, a trade association standard or other similar standard.

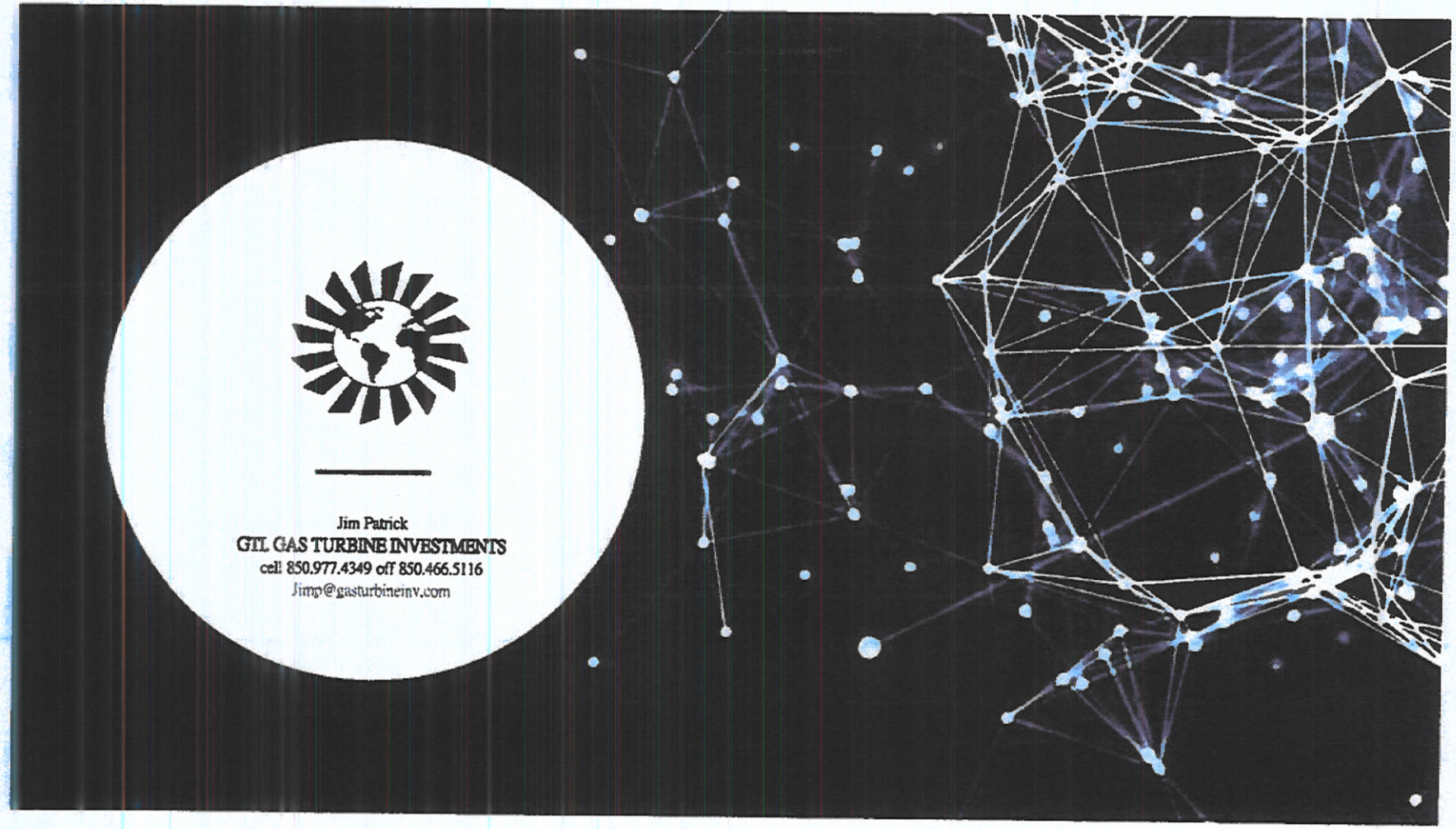
9.0 The zero hour turbine exchange for Macheche CT plant Rev.3a Quoation Form

Item	Description	Quantity	unit	Unit Price	Subtotal	Remarks
1A	The overhauled or refurbished zero-hour LM2500 SAC Engine Exchange	1	lots			
	- Fully refurbished Gas Turbine					
	-Includes all Campaign and Alert Service Bulletins complied with at the time of the overhaul.					
	- All new or refurbished blades, vanes and shrouds					
	- Including the installation of brand new or overhauled liquid fuel/ water injection nozzles and manifolds on the engine. (The minimum required fuel nozzles must be replaces.)					
	- Including the installation of one all set of Hydraulic Starting motors and pipelines.					
	-Including the installation of all set (AI and CR) individual T5.4 thermocouple to Junction Box 35					
	-The Engine warranty					
	-Free borescope inspection – 12 months after first use.					
1B	The Low-hour LM2500 SAC Engine Exchange include.	1	lots			
	- The Low-hour engine was last overhauled at GE Service Center or factory with GE license.					
	- Including the installation of brand new or overhauled liquid fuel/ water injection nozzles and manifolds on the engine. (The minimum required fuel nozzles must be replaces.)					
	- Including the installation of one all set of Hydraulic Starting motors and pipelines.					
	-Including the installation of all set (AI and CR) individual T5.4 thermocouple to Junction Box 35					
	-Borescope Inspection at facility (GE licensee or GE Service Center)					
	-The Engine warranty					
	-Free borescope inspection – 12 months after first use.					
2	The spare parts required for turbine exchange, please see Specification 3.7 item and attachment 4	1	lots			Minimum requirement
3	Secondary Flow Fuel Tube (Part Number: L46466G01)	30	EA			For the owner as additional spare parts
4	Primary Flow Fuel Tube (Part Number: L46380G01)	30	EA			For the owner as additional spare parts
5	The commissioning and 48 hours of continuous business test.	1	lots			
6	Engine Exchange tooling and consumables.	1	lots			
7	The Performance test and final report. (Any oil sampling testing and analysis are included in total contract price.)	1	lots			
8	The emission test and final report.	1	lots			
9	Shipping of the zero-hour engine to Macheche CT	1	lots			door-to-door
10	The return of Macheche engine ESN 560-012 to the contractor	1	lots			
11	The ESN 560-012 engine Shipping costs	1	lots			

9.0 The zero hour turbine exchange for Macheche CT plant Rev.3a Quoation Form

Item	Description	Quantity	unit	Unit Price	Subtotal	Remarks
12	The return of PI 456-906 engine with sipping container	1	lots			
13	The PI 456-906 engine Shipping costs	1	lots			
14	Field Service Support for removal and installation of the LM2500 SAC Gas Turbine	1	lots			
15	Round-trip air tickets, accommodation, vehicles and meals	1	lots			
	TOTAL					USD

Remarks:
1. If Engine on item 8 is damaged before shipping out, then the price shall be the same as item 10 (please refer to scope 3.14 and 3.15)
2. Turbine exchange can choose 1A item or 1B item.
3. The final decision of Macheche engine ESN 560-012 belongs to the Owner.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