National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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No. NEPRA/Consultant(RE/Tech)/LAG-317/1559-1561
January 27, 2022

Subject: **Order of the Authority in the matter of Request of Quaid-e-Azam Thermal Power (Private) Limited (QATPL) for Bi-Annual Testing/Operation GTs of its RLNG Based Power Plant on HSD as per OEM's Recommendations**

Dear Sir,

Enclosed please find herewith the subject Order/Decision of the Authority (04 Pages) regarding request of Quaid-e-Azam Thermal (Private) Limited (QATPL) for Bi-Annual testing/operation GTs of its RLNG Based Power Plant on HSD as per OEM's Recommendations.

2. The Order/Decision is being intimated to the Federal Government for the purpose of notification in the official Gazette pursuant to Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 within 30 days from the intimation of this Order/Decision. In the event the Federal Government fails to notify the subject Order/Decision or refer the matter to the Authority for reconsideration, within the time period specified in Section 31(7), then the Authority shall notify the same in the official Gazette pursuant to Section 31(7) of NEPRA Act.

Enclosure: As above

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(Syed Safeer Hussain)

Secretary
Ministry of Energy (Power Division)
'A' Block, Pak Secretariat,
Islamabad

CC:

1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Finance, 'Q' Block, Pak Secretariat, Islamabad.

National Electric Power Regulatory Authority (NEPRA)

Order of the Authority

in the Matter of Request of Quaid-E-Azam Thermal Power (Private) Limited for Bi-Annual Testing/Operation GTs of its RLNG Based Power Plant on HSD as per OEM's Recommendations

Quaid-E-Azam Thermal Power (Private) Limited (QATPL) is company owned by the Government of Punjab (GoPb). QATPL has setup a 1230.90 MW RLNG based (with HSD as backup fuel) power plant consisting of 2x416 MW Gas Turbines + 1x398.90 MW Steam Turbine at Bhikki, District Sheikhupura in the province of Punjab.

(2). QATPL achieved COD of the plant on May 20, 2018. The Authority has awarded a cost plus Tariff to QATPL on both (RLNG and HSD) fuels. However, due to the fact that HSD is a backup fuel, NPCC is allowed to despatch the QATPL's plant on HSD only in case of non-availability of RLNG.

(3). QATPL vide its Letter dated July 26, 2021 submitted that as per GTs OEM i.e. General Electric (GE), it is mandatory to operate both GTs of Bhikki Power Plant on HSD fuel twice in a year for a reliable start-up and operation of GTs on liquid fuel whenever required.

(4). QATPL informed that it also took up the matter with CPPA-G vide its letter dated February 08, 2021. In response, CPPA-G stated as under:

> *"As there is no provision in the PPA, which requires power purchaser/system operator to operate the plant on HSD fuel and also the plants are despatched on economic merit order or as per energy requirement of the system operator in emergency situations. Considering above contractual and factual position, out of merit operation of power plant on HSD fuel has financial implications, which may result an audit objection by CPPA Auditors and NEPRA. However, QATPL may present its case in next Operating Committee Meeting for discussion, please."*

(5). The Matter was discussed in the Operating Committee Meeting held on July 09, 2021 wherein CPPA-G advised QATPL to take up the matter with NEPRA as it has Tariff/Financial implications. Accordingly, QATPL requested the Authority to consider its technical requirement to comply with

the OEM's recommendations of bi-annual testing/operation of GTs of its power plant on HSD to ensure reliability of its operation on HSD.

(6). In this regard, QATPL also provided supporting documentary evidence namely **"Pressure Atomized Liquid Fuel Maintenance and Trouble-shooting Guidelines"** from GE. The Para-IV(C) of the said guidelines is reproduced hereunder:

> *"The unit shall be operated on liquid fuel every six months to ensure all components are exercised and operating correctly. In order to complete this requirement, the gas turbine shall be:*
>
> *1. Either started on liquid fuel (in case the turbine was shutdown) or transferred from gas to liquid fuel at low load.*
> *2. Loaded up to LFE mode.*
> *3. Held in LFE mode for 30 minutes.*
> *4. Either shutdown or transferred back to gas.*
>
> *Ensure the water flush was successful after liquid fuel was turned off."*

(7). From the above, it is noted that the OEM has given two options to serve the purpose i.e. (i). Either start on Liquid Fuel or (ii). Transfer from Gas to Liquid Fuel at low load (Online Changeover from RLNG to HSD). Regarding cost/financial implication QATPL submitted its working as under:-

a). <u>Cost of Start-up on HSD:</u>

Estimated cost of Start-up to LFE Mode then Shutdown			
Step	Estimated HSD Consumption (Ltrs)	Time Required (Minutes)	Output Delivered (MW)
From Start-up to FSNL	1,736		
Stabilization time at FSNL (half hour)	9,441		
Sync to LFE Mode	16,006	29	41.08
Machine operation on LFE Mode (half hour)	30,000	30	85.00
During shutdown of machine	17,580	15	21.25
Total consumption for one successful start	75,000		
HSD consumption for two starts in a year for each GT	**300,000**		

	@ current Tariff	
Total cost of HSD fuel consumption	8.25	PKR. Million
Total Generation on HSD fuel	147.33	MWh
Expected Recovery of cost (HSD FCC)	2.964	PKR. Million
Net cost impact for each GT Start-up	5.30	PKR. Million
Net cost impact for each year for Start-ups only	**21.14**	**PKR. Million**

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NOTES:

Fuel Cost Component considered=(8.4527*110/46.21) Rs/KWh (Current tariff)

HSD price is assumed Rs 110/liter

Heat Rate Degradation, Output Degradation, Part Load and Variation in Fuel Prices to be applied as per actual.

b). **Cost of Online Changeover from RLNG to HSD:**

Estimated Cost for Online Fuel Changeover from RLNG to HSD and back to RLNG		
Activity		HSD Consumption (Ltrs)
GT Fuel changeover from Gas to HSD on LFE Mode and half hour operation on HSD		30,000
Total Consumption for one successful changeover		30,000
HSD consumption for two online changeovers in a year for each GT		**120,000**
Before Changeover	**@ current Tariff**	
Complex (GT1, GT2, ST) Load	1110	MW
Generation on RLNG (25 min)	462.5	MWh
Fuel Changeover		
GT1 changeover to HSD at 170 MW		
Complex (GT1,GT2, ST) Load at changeover	850	MW
GT1 generation on HSD (35 min)	99.17	MW
ST generation on HSD (35 min)	54.09	MWh
ST generation on RLNG (35 min)	120.91	MWh
GT2 generation on RLNG (35 min)	221.67	MWh
Total generation on HSD	153.26	MWh
Cost of generation on HSD	3.30	PKR Million
Expected Recovery of cost (HSD FCC)	3.10	PKR Million
Total hourly generation	958.33	MWh
Capacity payment loss	0.29	PKR Million
Net cost impact for each GT changeover	0.51	PKR Million
Net cost impact for each year for online changeover only	**2.03**	**PKR Million**

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NOTES:

Fuel Cost Component considered=(8.4527*110/46.21) Rs/KWh (Current tariff)

Capacity Rate considered = 1.9358 Rs/KWh (HSD reference tariff)

HSD price is assumed Rs 110/liter

Heat Rate Degradation, Output Degradation, Part Load and Variation in Fuel Prices to be applied as per actual.

Order:

(8). The Authority has examined and duly considered the submissions of QATPL including the information provided with its application. The Authority is of the considered view that the request of QATPL is based on real technical grounds and carries weight as the same is in line with the recommendation of OEM for reliability of GTs on HSD. Further, the Authority has reviewed the above working of QATPL and found that the option (ii) is plausible and rationale.

(9). In view of the above, the Authority hereby approves the request of QATPL and allows the cost of PKR 2.03 Million for Online Changeover from RLNG to HSD on bi-annual basis as detailed at Para-7(b) above subject to the following directions:-

a). Heat Rate Degradation, Output Degradation and Variation in Fuel Prices will be applied as per actual.

b). QATPL will not be entitled for the abovementioned cost of PKR 2.03 Million in case the plant is operated on HSD upon the instructions of System Operator due to the system requirements and hence the recommendations of the OEM are met with.

(Engr. Maqsood Anwar Khan)
Member

(Rehmatullah Baloch)
Member

(Tauseef H. Farooqi)
Chairman

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