



Registrar

National Electric Power Regulatory Authority Islamic Republic of Pakistan

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad.
Ph: +92-51-9206500, Fax: +92-51-2600026
Web: www.nepa.org.pk, E-mail: registrar@nepa.org.pk

No. NEPRA/TRF-255/JPCL-2014/16133-16136
October 19, 2018

Subject: **Decision of the Authority in the matter of Request filed by JPCL for Modification in the Existing Mechanism of Fuel Cost Component on account of Utilization of Re-Gasified Liquefied Natural Gas (RLNG) (Case No. NEPRA/TRF-255/JPCL-2014)**

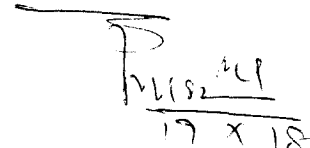
Dear Sir,

Please find enclosed herewith the subject decision of the Authority (07 pages) in the matter of Request filed by JPCL for Modification in the Existing Mechanism of Fuel Cost Component on account of Utilization of Re-Gasified Liquefied Natural Gas (RLNG) in Case No. NEPRA/TRF-255/JPCL-2014.

2. The decision is being intimated to the Federal Government for the purpose of notification of adjustment in the approved tariff through the official Gazette pursuant to Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

3. The Order of the Authority is to be notified in the official Gazette.

Enclosure: As above


(Syed Safer Hussain)

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

CC:

1. Secretary, Cabinet Division. Cabinet Secretariat, Islamabad
2. Secretary, Ministry of Finance, 'Q' Block, Pak Secretariat, Islamabad
3. Secretary, Privatization Commission, 5-A, EDB Building, Constitution Avenue, Islamabad.



**DECISION IN THE MATTER OF REQUEST FILED BY JPCL FOR MODIFICATION IN THE
EXISTING MECHANISM OF FUEL COST COMPONENT ON ACCOUNT OF
UTILIZATION OF RE-GASIFIED LIQUEFIED NATURAL GAS (RLNG)**

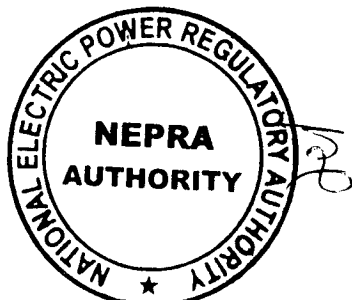
1. INTRODUCTION

- 1.1. Jamshoro Power Company Limited (hereinafter referred as “JPCL”) vide letter dated 8th March 2018, requested for the change in fuel price adjustment mechanism for utilization of RLNG due to shortage of gas and cut in the supply of RFO. JPCL requested following fuel cost components for operation of plants on RLNG on the basis of already approved heat rates:

| Name of Power Station | Block | Unit | Net Heat Rate approved by NEPRA (Btu/kWh) | Requested FCC on RLNG (Rs./kWh) |
|-----------------------|-------|-----------|---|---------------------------------|
| Jamshoro | 2 | 2 | 12,197.0 | 13.4172 |
| | | 3 | 11,869.0 | 13.0553 |
| | | 4 | 11,614.0 | 12.7759 |
| Kotri | 3 | 3 – 7 | 10,237.0 | 11.2612 |
| | | (w/o CCP) | 15,355.5 | 16.8917 |

RLNG Price of Rs. 1,100.044 (USD 10.0004/MMBTU at exchange rate of Rs. 110/USD)

- 1.2. JPCL vide above referred letter also requested the immediate application of RLNG as alternate fuel in accordance with Rule 4 (7) of NEPRA (Tariff Standards and Procedures) Rules, 1998.
- 1.3. The Authority considered the above referred request on 20th March 2018 and accepted the application filed by JPCL and decided to initiate proceedings to modify the existing mechanism of fuel cost component on account of Re-Gasified Liquefied Natural Gas (RLNG).
- 1.4. JPCL vide letter dated 9th April 2018 again requested to expedite the matter for immediate application of RLNG as alternate fuel keeping in view the non-availability of Gas and RFO, upcoming and increase in demand of electricity due to summer season.
- 1.5. The Authority considered JPCL's request of immediate application of RLNG as alternate fuel under Rule 4(7) of NEPRA (Tariff Standards and Procedures) Rules, 1998 on April 10, 2018, and decided to grant immediate application of RLNG as



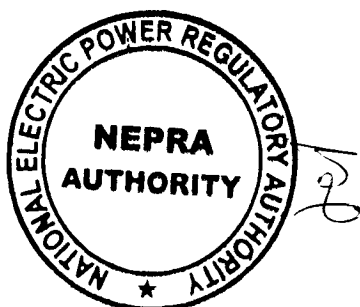


alternate fuel in line with the permission granted to IPPs earlier. Accordingly, decision in the matter was issued on April 12, 2018, which was subject to the following conditions:

- i) Dispatch shall be strictly in accordance with the economic merit order.
- ii) Operation on simple cycle shall not be allowed.

2. PROCEEDINGS

- 2.1. The Authority decided to hold a hearing in the matter on April 17, 2018. Accordingly, the notice of hearing was published in the newspapers on April 10, 2018. Stakeholders were invited to participate in the proceedings through filing comments/ intervention requests. Individual notices were also sent to important stakeholders on April 10, 2018 inviting comments/ intervention requests to assist the Authority in arriving at a just and informed decision. No comments or interventions requests were received in the matter. Hearing in the matter was held as per schedule and was participated by the representatives of the JPCL and NPGCL.
- 2.2. In order to proceed further with the case, JPCL was directed vide letter dated April 30, 2018, directed to provide following information:
- i) Gas supply agreement (GSA) or any other interim arrangement with SSGC / SNGPL which includes specifications of delivered RLNG like pressure, allocated quota and duration of agreement etc;
 - ii) Impact on operational parameters of the power plants including net capacity, auxiliary consumption and net thermal efficiency owing to utilization of RLNG instead of RFO;
 - iii) Impact on annual availability along with outages, O&M expenses (fixed and variable), annual plant capacity factor and frequent start/stops etc. owing to utilization of RLNG instead of RFO;
 - iv) Steps taken by JPCL and NPGCL for modification in the existing generation licenses and Power Purchase Agreements (PPA's).
- 2.3. JPCL vide letter dated June 5, 2018, submitted a reply which was analyzed viz a viz the reply submitted by JPCL vide letter No. CEO/JPCL/TD/34423-24 dated 21st October 2013 on the issue of utilization of gas instead of RFO. The Authority found apparent contradiction in the two aforementioned responses of JPCL which are summarized below:



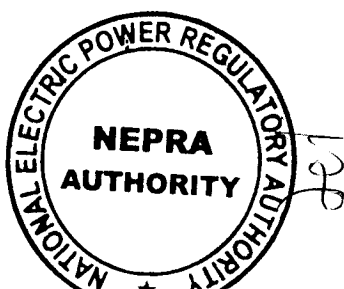
2

St



| Issues framed by Technical Department | Latest Submission | Earlier Submission |
|---|-------------------|--|
| Impact on net capacity and auxiliary consumption owing to utilization of RLNG instead of RFO | No Impact | On gas fuel the auxiliary power consumption is tremendously reduced as it does not require any aux. power for decanting, heating and pumping like RFO. On gas fuel the unit output capacity can be increased up to 5 MW on each unit i.e. 15 MW load can be achieved in excess on three units. |
| Impact on Heat Rate / Thermal Efficiency owing to utilization of RLNG instead of RFO | No Impact | Owing to increase in output capacity of the power plant the Heat Rate / Thermal Efficiency will be improved. |
| Impact on O&M Expenses (Fixed and Variable) owing to utilization of RLNG instead of RFO | No Impact | The maintenance cost of the equipment on gas fuel is reduced due to less wear and tear and outages. |
| Impact on annual plant availability, plant capacity factor and frequent start/stops owing to utilization of RLNG instead of RFO | No Impact | The availability and reliability of the generating units will be improved. The use of gas fuel minimizes the soot deposition and ultimately reduces the outages due to frequent choking of air pre heaters. Frequent shut downs for APH washing, tube leakages and repair of flue gas duct path will be decreased. Moreover, no erosion/corrosion in the flue gas duct and allied component occurs. |

- 2.4. It was also noted that the approved heat rates and dependable capacity in respect of TPS Jamshoro (on both fuels i.e., RFO/Gas) were based on the test results conducted by Independent Engineer on RFO. These were approved by the Authority owing to the fact that the plants would mostly be operated on RFO fuel due to scarcity of





indigenous natural gas. Since the instant request of JPCL pertains to allowing utilization of firm quantity of RLNG as primary fuel instead of RFO, therefore, apart from Kotri units 3 – 7 (CCP), the Authority has decided to separately determine heat rates and net capacity for operation on gas/RLNG. For Kotri units 3 – 7 (CCP), there shall be no change in the operational parameters as this is already operating on Gas. Likewise there shall be no change in the operational parameter on plants operation on RFO.

- 2.5. The Authority noted that gas fired thermal power plants require less auxiliary power as compared to RFO based operations. This is also evident from Authority's earlier decisions in the matter of RFO fired steam turbine based power plants including Pakgen, Lalpir, BQPS-I and HUBCO, wherein the Authority allowed auxiliary consumption within the range of 7% – 8% of gross capacity at RSC. However, in the case of gas fired combine cycle power plants, the Authority allowed auxiliary consumption within the range of 2% – 3% of gross capacity at RSC. Therefore, in the instant case, based on JPCL's 2013 response in the matter, the Authority has decided to approve 5MW increase in the net capacity for each of the units 2 – 4 of TPS Jamshoro for operation on gas/RLNG.
- 2.6. Likewise, the Authority has decided to increase the net HHV thermal efficiency for each of the units 2 – 4 of TPS Jamshoro by 0.903% (equivalent of 1% increase in net LHV thermal efficiency) for operation on RLNG. The revised heat rates shall be applicable both for operation on RLNG and gas. The revised heat rates are provided hereunder:

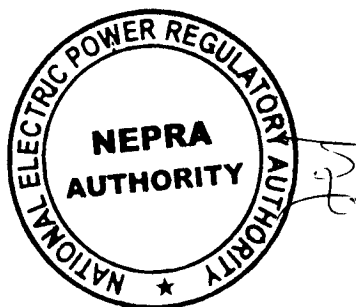
| Name of Power Station | Block | Unit | Fuel | Reference Net HHV Heat Rate (Btu/kWh) | Revised Net HHV Heat Rate (Btu/kWh) |
|-----------------------|-------|------|----------|---------------------------------------|-------------------------------------|
| Jamshoro | 2 | 2 | Gas/RLNG | 12,197 | 11,816 |
| | | 3 | Gas/RLNG | 11,869 | 11,507 |
| | | 4 | Gas/RLNG | 11,614 | 11,268 |

- 2.7. Based on the revised heat rates, reference gas price of Rs. 588.23/MMBTU and reference HHV RLNG price of Rs. 1615.99/MMBTU (US\$ 13.0185/MMBTU @ of Rs. 124.1302/US\$), reference fuel cost components at both fuel shall be as under:



| Name of Power Station | Block | Unit | Fuel | Revised FCC (Rs./kWh) |
|-----------------------|-------|------------|------|-----------------------|
| Jamshoro | 2 | Unit 2 | Gas | 6.9505 |
| | | | RLNG | 19.0945 |
| | | Unit 3 | Gas | 6.7688 |
| | | | RLNG | 18.5952 |
| | | Unit 4 | Gas | 6.6282 |
| | | | RLNG | 18.209 |
| Kotri | 3 | Unit 3 - 7 | Gas | 6.0217 |
| | | | RLNG | 16.5429 |
| | | (w/o CCP) | Gas | 9.0326 |

- 2.8. The Authority is cognizant of the fact that the aforementioned figures may not be accurate, therefore, the Authority directs JPCL to carry out heat rate and net dependable capacity tests on RLNG fuel by an independent engineer within a period of 6 months from the date of notification of the instant decision.
- 2.9. The Authority directs that the selection process and appointment of an Independent Engineer shall be approved by NEPRA, whereas, the tests shall be conducted in the presence of NEPRA professionals as observers. Subsequent to the submission of the test report to the satisfaction of the Authority, onetime adjustment shall be made in the net capacity and fuel cost component, provided that the established net capacity and net LHV thermal efficiency on gas/RLNG does not fall below the already approved net capacity and net LHV thermal efficiency for RFO based operation of units 2~4 of TPS Jamshoro. Regarding degradation and part load adjustments the existing approved mechanism may also be continued for RLNG based operation.
- 2.10. The Authority further noted that operation on RLNG shall result in savings in variable O&M due to lesser plant maintenance. However, at this stage, the savings are difficult to estimate. Therefore, the Authority has decided to maintain the existing variable O&M for a period of one year, after which the same shall be revisited based on historical operational data of the plant, audited financial reports and additional investigations to be carried out by NEPRA.
- 2.11. The Authority also considers that there shall be increase in the availability of the plant for operation on RLNG as compared to RFO due to lesser outages. The annual plant availability of 73% for units 2 – 4 of TPS Jamshoro, as per the PPA also needs to be reviewed and is expected to be available upto 80% on RLNG. Therefore, the Authority has decided to increase plant availability to 80% for units 2 – 4 of TPS Jamshoro.



3. ORDER

- 3.1. The Authority hereby determines the following fuel cost components for Jamshoro Power Company Limited on gas and RLNG w.e.f. 12th April 2018 for sale of electricity to the power purchaser:

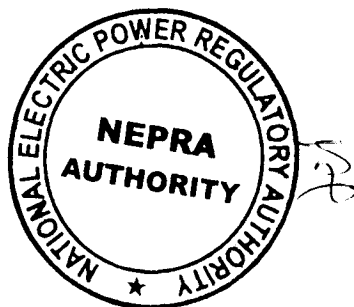
| Name of Power Station | Block | Unit | Fuel | Revised FCC (Rs./kWh) |
|-----------------------|-------|------------|------|-----------------------|
| Jamshoro | 2 | Unit 2 | Gas | 6.9505 |
| | | | RLNG | 19.0945 |
| | | Unit 3 | Gas | 6.7688 |
| | | | RLNG | 18.5952 |
| | | Unit 4 | Gas | 6.6282 |
| | | | RLNG | 18.209 |
| Kotri | 3 | Unit 3 - 7 | Gas | 6.0217 |
| | | | RLNG | 16.5429 |
| | | (w/o CCP) | Gas | 9.0326 |

- 3.2. JPCL is directed to carry out heat rate and net dependable capacity tests on RLNG fuel by an independent engineer within a period of 6 months from the date of notification of the instant decision. JPCL is further directed that the selection process and appointment of an Independent Engineer shall be approved by NEPRA and the tests shall be conducted in the presence of NEPRA professionals as observers. Subsequent to the submission of the test report to the satisfaction of the Authority, onetime adjustment shall be made in the net capacity and fuel cost component, provided that the established net capacity and net LHV thermal efficiency on gas/RLNG does not fall below the already approved net capacity and net LHV thermal efficiency for RFO based operation of units 2~4 of TPS Jamshoro. Regarding degradation and part load adjustments the existing approved mechanism may also be continued for RLNG based operation.
- 3.3. Fuel cost component on each fuel shall be adjusted on account of variation in fuel prices as per following mechanism:

$$FC_{(Rev)} = FC_{(Ref)} \times FP_{(Rev)} / FP_{(Ref)}$$

Where:

$$FC_{(Rev)} = \text{Revised fuel cost component of energy charge part of tariff}$$





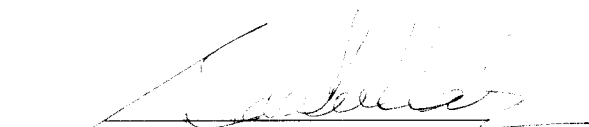
$FC_{(Ref)}$ = Reference fuel cost component


$FP_{(Rev)}$ = Revised applicable HHV price of RFO/Gas/RLNG as the case may be


$FP_{(Ref)}$ = Reference HHV prices, RFO of Rs. 72,897/ton, gas of Rs. 588.23/MMBTU and RLNG of Rs. 1,615.99/MMBTU

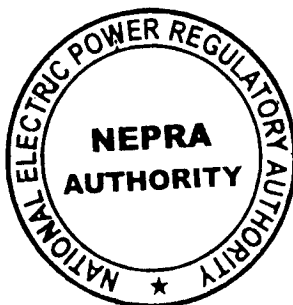
- 3.4. Existing variable O&M shall be applicable for a period of one year, after which the same shall be revisited based on historical operational data of the plant, audited financial reports and additional investigations to be carried out by NEPRA.
- 3.5. Dispatch shall be strictly in accordance with the economic merit order.
- 3.6. Open cycle operation of plant on RLNG shall not be allowed.
- 3.7. The above order of the Authority shall supersede the interim tariff vide decision dated 12th April 2018 in the matter of Immediate Application of RLNG as Alternative Fuel for Jamshoro Power Company Ltd with order of refund of the excess amount charged to the power purchaser.
4. The above Order is to be notified in the official gazette in accordance with the provisions of Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

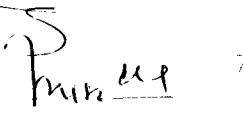
AUTHORITY


(Saif Ullah Chattha)
Member 18.10.2018


(Rehmatullah Baloch)
Vice Chairman 2/18/10/18


(Brig. (R) Tariq Sadozai)
Chairman




17 X 18