

To,
Mr. Iftikhar Ali Khan,
Director Registrar Office,
National Electric Power Regulatory Authority,
Islamabad.

July 12th, 2018

Letter No: "CPHG-NEPRA/ZY-AS/18-0096".

Subject: "Ramping rate and synchronization to Grid for 2x660 (1320MW) Imported Coal based IPP at Hub, Baluchistan".

Dear Sir,

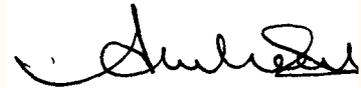
This is reference to your letter no. "NEPRA/R/LAG-314/9977" dated "July 2nd, 2018". Whereby, your good office has directed to submit the modification application as per the procedures laid down under NEPRA Licensing (Application & Modification Procedures) Regulations, 1999 (AMPR).

The Licensee Proposed Modification (LPM) required under regulation 10(2) was already submitted to NEPRA vide letter no. "CPHG-NEPRA/ZY-AS/18-0060" dated "May 9th, 2018" (attached as Annexure I). Further, we are submitting modification fee pay order as per regulation 10(3) along with this letter.

Kindly consider our application as per the procedures and let us know if you require any further information.

Thanking you for your kind support and guidance.

Kind Regards,



**Ambreen Shah,
Vice President Legal
& Corporate Affairs.**

Encl:

1. Letter CPHG-NEPRA/ZY-AS/18-0060.
2. Pay order amounting PKR 400,000/-.



To,
Mr. Iftikhar Ali Khan,
Director Registrar Office,
National Electric Power Regulatory Authority
Islamabad.

May 9th, 2018

Letter No: "CPHG-NEPRA/ZY-AS/18-0060".

Subject: "Ramping Rate & Synchronization to Grid for 2X660 (1320 MW) Imported Coal based IPP at Hub, Balochistan".

Dear Sir,

Reference to the Schedule 1, details of Generation Facility/Power Plant, part F (Plant Characteristics), Generation License dated September 8, 2016 of our Company, we were required to intimate NEPRA in relation to the "Ramping Rate" and "Time required to Synchronize to Grid (hrs)". The required details are provided below.

1. Proposed Modification:

CPHGC has proposed to modify the Ramping rate (MW/min) and time required to synchronize to Grid (HRs) in its Generation License as per following:

(i). Load ramping rate in generation license schedule I

(v).	Ramping Rate (MW/min)	≤1.2% (instead of "later")
------	-----------------------	----------------------------

Note : The 1.2% /min rate load is the max load ramping rate which is under Unit load >50% and reliable operation, other status data are showing follows:

Unit load range % age	Cold Start (% / Min)	Warm Start (%/Min)	Hot Start (% /Min)
0 < 30	≤0.4	≤0.8	≤0.9
>30 < 50	≤0.45	≤0.54	≤0.54
>50 < 100	≤0.45	≤0.54	≤1.2

(ii). Notice required synchronizing (minutes) in generation license schedule I

(vi).	Time required to Synchronize to Grid	1240 (instead of "later")
-------	--------------------------------------	---------------------------

Note : The time in the above table means: After receiving the start-up command to synchronize

to the Power Purchaser Grid, and this value is specifically referred to the cold start. Data in other different states are showing as follow:

Length of Shutdown	Notice required time synchronizing (minutes)
Not more than 2 hours	≤195
More than 2 hours but less than 10 hours	≤275
More than 10 hours but less than 72 hours	≤645
More than 72 hours but less than 120 hours	≤910
More than 120 hours	≤1240

2. Statement of the reasons in support of the modification

The date of Generation License No. IGSPL/68/2016 granted by National Electric Power Regulatory Authority (NEPRA) to China Power Hub Generation Company (Private) Limited (CPHGCL) was on 8 September 2016. CPHGC had not finalized the load ramping rate and Notice required synchronizing data by then, they were filled "later" instead.

- **Clarification for modified data in generator license**

- (i) **Load ramping rate**

For coal-fired generating units, when the power grid dispatch requires the unit to lift load, it needs to be controlled by the boiler feed water control system, fuel (coal-fired) control system, air flow (combustion air needed for combustion), and other corresponding equipment. The change of the steam inlet parameters (steam flow, steam pressure, steam temperature) will be based on the change of the boiler outlet steam parameters.

When the balance between the heat generated by boiler combustion and the heat absorbed by the boiler feed water (steam) system is maintained, the temperature of the metal on the heating surface of the boiler and the temperature of the generated steam are in a stable state. On the contrary, when the balance is destroyed, the temperature of the metal on the heating surface of the boiler will be too high or too low, and the same of the steam temperature, which will affect the boiler and turbine equipment.

The fuel used in our supercritical boiler is coal and a direct-fired pulverizing system is also used to pulverize the coal for combustion. The combustion mode is different from that of the oil-fired boiler. It takes at least 180 seconds from the change of fuel quantity (change of the coal quantity in the coal feeder) to the boiler combustion, during which the boiler feed water volume and the amount of air flow required for combustion shall match to a reasonable level so as to achieve a stable boiler heat balance with the heat absorbed by the feed water (steam). In our case, when the load change rate changes too fast exceeding 1.2%/min, the balance between the boiler combustion system and the boiler water supply system will be undermined, which will affect the safety of the boiler and steam turbine.



(ii) **Notice required synchronizing.**

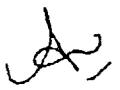
The cold start of large coal-fired power plant requires power (auxiliary power), coal (the fuel needed for the start-up process), and water (qualified demineralized water; 5000 tons of storage quantity are required for each time of cold start-up), oil (diesel fuel for igniting pulverized coal in the initial phase of coal-fired power plant start-up) and the preparation of related systems. In order to ensure the power supply for the cold start-up machinery and equipment, as well as enough time to produce demineralized water, the demineralized water production system is required to run continuously for 1800 minutes for cold-start.

The once-through boilers, including supercritical boilers, have very strict demineralized water quality requirements for start-up. Unlike the steam drum boilers, once-through boilers cannot discharge pollutants and unqualified working fluids. Once these fluids enter into the boiler and steam turbine, it will cause fouling on the heater surface of the boiler and accumulation of salt in the steam turbine through-flow parts, which will endanger the safety of the boiler and the steam turbine. For the once-through boilers, including supercritical boilers, in the initial period of start-up and during start-up, all pipes and vessels (including condensers, low-pressure heaters, deaerators, high-pressure heaters, boiler heating surface pipes, and steam water separator) to the boiler are required of repeated rinsing by using qualified demineralized water to ensure the fluids quality entering the boiler is not affected by the impurities stored in these pipes and containers. The flushing time is required of 360 minutes and the flushing water volume of 2000 tons since the water circulation flushing can only be performed after receiving the start command.

For the once-through boilers and supercritical boilers, due to the thicker wall of the steam water separator and the slower expansion, however, the wall of the pipes connected to the separator is thinner and expanding faster, so when the water enters the boiler, it is necessary to control the temperature and the speed of the feed water. Excessively high or low feed water temperatures and excessively high speed will cause uneven expansion, cracking in the weld and other damages on equipment. As for CPHGC's boilers, the capacity of the economizer and the water-wall is 280m³, and the boiler feed water temperature should be limited at about 75°C and the feed water flow should be 100 tons/hour. In conclusion, it takes 300 minutes for the entire process to satisfy the boiler feed water need for ignition.

After the boiler is successfully ignited with fuel, a large amount of diesel fuel shall be used to increase the temperature of the furnace, the secondary air system required to heat the pulverized coal and the primary air system required to convey the pulverized coal produced by the coal mill. For the kind of coal used by CPHGC, the ignition point is around 650-840°C. If there is insufficient temperature for the secondary air to assist the combustion of pulverized coal that combusted in the furnace, which will eventually lead to incomplete combustion and such instability of the pulverized coal will cause the deflagration of the furnace. Without a sufficiently high primary air flow, the pulverized coal produced by the coal mill cannot be transported to be combusted. To achieve the above-mentioned purposes, it takes 90 minutes after the boiler is ignited.

After the boiler is ignited, the temperature rising speed of the heating surface must be controlled. If the temperature rises too fast, the thermal stress between the heating surfaces of





the boiler will increase, so the temperature rising speed must not exceed 1°C/min, thereby, 360 minutes is needed to reach turbine turning parameters

3. **Statement of the impact on the tariff, quality of service and the performance by the licensee of its obligations under the license**

CPHGC would like to informed that the tariff, quality of service and the performance of the company of its obligations under the generation license will not be affected by the proposed modification

Kindly let us know if you require any further information. Thanking you for your kind support and guidance.

Kind Regards,

A handwritten signature in black ink, appearing to read 'Ambreen Shah', is written over a horizontal line.

AMBREEN SHAH
VP – LEGAL & CORPORATE AFFAIRS