PORT QASIM ELECTRIC POWER COMPANY (PRIVATE) LIMITED

Ref: PQEPC/NEPRA/2018-5
19 January 2018

Registrar
National Electric Power Regulatory Authority
NEPRA Tower, Ataturk Avenue (East), G-5/1
Islamabad, Pakistan.

SUBJECT: Application under Regulation 10(2) of the NEPRA (Application & Modification Procedure) Regulations, 1999 read together with all other enabling provisions of law, on behalf of Port Qasim Electric Power Company (Pvt.) Limited for Modification of its Generation License

Dear Sir,

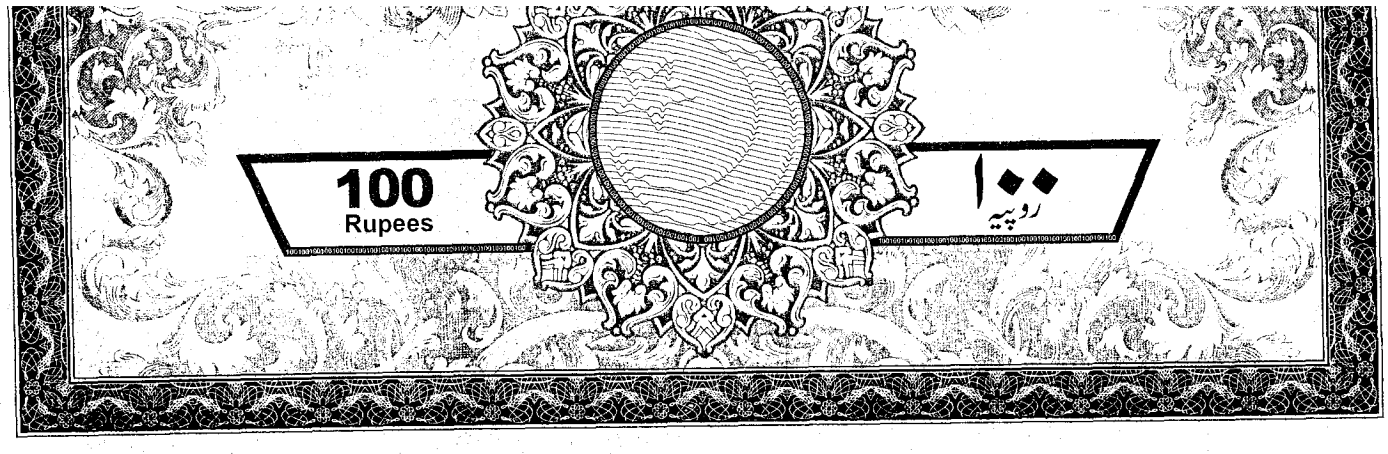
1. We, Port Qasim Electric Power Company (Pvt.) Limited (the "**Company**"), hereby submit the enclosed application under Regulation 10(2) of the NEPRA (Application & Modification Procedure) Regulations, 1999 read together with all other enabling provisions of law, for the modification of our Generation License No. IGSPL/47/2015 dated 3 February 2015 (the "**Application**").

2. Please also find enclosed pay order for Rupees Seven Hundred Sixty Four Thousand and Four Hundred (Rs. 764,400), which is the filing fee for the Application.

3. Thanks for your constant support.

Yours sincerely,

Mr. Cai Bin
Chief Executive Officer



AFFIDAVIT

I, CAI BIN, CHIEF EXECUTIVE OFFICER of **PORT QASIM ELECTRIC POWER COMPANY (PRIVATE) LIMITED**, having its registered office located at House No. 63, Street No. 5, Sector F-8/3, Islamabad, Pakistan (hereinafter referred to as the "**Company**"), do hereby solemnly affirm and declare on oath as under:

1. That I am a duly authorized Chief Executive Officer of the Company and I am well conversant with the affairs of the Company.

2. That I confirm, record, assure and declare to you that the contents of the accompanying application for modification of Generation License No. IGSPL/47/2015, for the Company's 1320 MW imported coal based thermal generation facility located at Bin Qasim Industrial Park at Port Qasim, Karachi, Sindh, including all supporting documents are true and correct to the best of my knowledge and belief, and nothing material or relevant thereto has been concealed or withheld therefrom.

DEPONENT

Verification

I, the above named deponent do hereby solemnly affirm on oath that the contents of the above affidavit are correct and true to the best of my knowledge and nothing has been concealed therein.

DEPONENT

Dated: 2018. Jan. 19th

04

BEFORE

THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

APPLICATION FOR MODIFICATION OF
GENERATION LICENSE NO. IGSPL/47/2015 DATED 3 FEBRUARY 2015

ON BEHALF OF

PORT QASIM ELECTRIC POWER COMPANY (PRIVATE) LIMITED

PURSUANT TO REGULATION 10(2) OF THE NEPRA (APPLICATION & MODIFICATION PROCEDURE) REGULATIONS, 1999 (THE "1999 REGULATIONS") READ TOGETHER WITH THE REGULATION OF GENERATION, TRANSMISSION AND DISTRIBUTION OF ELECTRIC POWER ACT, 1997 AND ALL OTHER ENABLING PROVISIONS OF LAW

DATED: JANUARY 19TH 2018

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Extracts of the Minutes of the Board Meeting of the Company

PORT QASIM ELECTRIC POWER COMPANY (PRIVATE) LIMITED

EXTRACTS OF THE MINUTES OF THE MEETING OF THE BOARD OF DIRECTORS OF PORT QASIM ELECTRIC POWER COMPANY (PRIVATE) LIMITED HELD ON JANUARY 15TH 2018

The Board Meeting of Port Qasim Electric Power Company (Private) Limited (the "**Company**") was held on January 15th, 2018. The following Resolutions were duly adopted by the Board of Directors and that the said resolutions have not been modified or rescinded and are now in full force and effect and is in conformity with the Articles of Association:

"RESOLVED, that the "Application for Modification of Generation License No. IGSPL/47/2015" for the 1320 MW imported coal based thermal generation facility located at Bin Qasim Industrial Park at Port Qasim, Karachi, Sindh (the "**Application**"), is hereby approved for submission by the Company to the National Electric Power Regulatory Authority (the "**NEPRA**")."

"RESOLVED, that Mr. Cai Bin, Chief Executive of the Company, is hereby given the mandate and authorized to

(1) review, execute and submit the Application or any other related document, including any contracts, affidavits, statements, documents, powers of attorney, letters, forms, applications, deeds, guarantees, undertakings, approvals, memoranda, amendments, letters, notices, certificates, requests, statements and any other instrument of any nature whatsoever, to NEPRA, for and behalf of the Company and to proceed with and make any corrections and amendments, if required, in finalizing the Application or any other related document;

(2) attend, represent and participate in all meetings, negotiations, hearings and conferences of whatsoever nature before NEPRA or any other regulatory authority or official or person in connection with the submission and approval of the Application and pay the necessary fees, for and on behalf of the Company; and

(3) do all such acts including but not limited to delegation of any of the powers granted herein to any other director or officer of the Company, singly or jointly, and submit all such documents as may be necessary in respect of the foregoing resolutions."

"RESOLVED FURTHER, that each of the Directors, Chief Executive and Secretary of the Company may, signing singly, certify copies of this Resolution to be true copies of the original."

Mr. Xiao Xin
Company Secretary

Company Secretary
Port Qasim Electric Power Company
(Private) Limited

Affidavit

Application for Modification of Generation License

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1. DETAILS OF THE PETITIONER

1.1 Name and Address

Port Qasim Electric Power Company (Private) Limited
Address: House No. 63, Street No. 5, Sector F-8/3, Islamabad, Pakistan
E-mail: pqep@pqep.net
Phone: 051-2266341
Fax: 051-2266342

1.2 Particulars of Authorized Representative

Name: Mr. Cai Bin
Designation: Chief Executive Officer

1.3 Project Details

Port Qasim Electric Power Company (Private) Limited (the "**Company**") is a private limited company incorporated under the laws of Pakistan and is establishing a 1320 MW imported coal based thermal generation facility located at Bin Qasim Industrial Park at Port Qasim, Karachi, Sindh.

NEPRA granted the Company Generation License No. IGSPL/47/2015 dated 3 February 2015 (the "**Generation License**") under Section 15 of the Regulation of the Generation, Transmission and Distribution of Electric Power Act, 1997.

2. TEXT OF THE PROPOSED MODIFICATIONS

Pursuant to Regulation 10(2) of the 1999 Regulations, the Company hereby applies for the following modifications to the specifications set out in Schedule 1 of the Generation License:

2.1 The Ramping rates (MW/min) set out in row (v) of table F of Schedule 1 of the Generation License (under the heading "Detail of Generation Facility / Power Plant") are proposed to be modified as follows:

Unit load	Cold start (%)	Warm start (%)	Hot start (%)
0<30%	≤0.2	≤0.5	≤1
>30% <50%	≤0.3	≤0.7	≤1
>50% <100%	≤0.5	≤1	≤1

2.2 The time required to Synchronize to the Grid (Hrs.) set out in row (vi) of table F of Schedule 1 of the Generation License (under the heading "Detail of Generation Facility / Power Plant") is proposed to be modified as follows:

Length of Shutdown	Notice required synchronizing (The time start after boiler ignited)
Not more than 2 hours	≤200 mins
More than 2 hours but less than 8 hours	≤270 mins
More than 8 hours but less than 32 hours	≤480 mins
More than 32 hours but less than 150 hours	≤580 mins
More than 150 hours	≤900mins

3. RATIONALE FOR THE PROPOSED MODIFICATIONS

The above modifications to the Ramping rates and the time periods for synchronization to the Grid are necessary because these specifications were provided by the Company to NEPRA at the time of filing of the application for grant of its Generation License and were tentative and indicative in nature. Accordingly, these specifications require modification in light of the actual design and requirements of the power plant and the data and instructions provided by the manufacturer to the Company.

NEPRA has recognized this as a valid ground for modification of the generation license in paragraph E(vi) (pages 9 and 10) of its determination dated 27 October 2017 in the matter of the application for modification of generation license of Huaneng Shandong Ruyi (Pakistan) Energy (Pvt.) Limited ("HSRPEPL"), where it stated that:

> *"...the Authority observes that the technical data/parameters regarding the projects provided by the applicants at the time of filing of generation licence application are mostly tentative and according to the feasibility studies of the project. The same are expected to refine and finalized at later stages, according to the manufacturer provided data. It is relevant to mention here that this issue has been considered in the generation licences and accordingly a sub-article has been added in the generation licences. In article 3.3 of the existing generation licence of HSRPEPL the licensee has been directed to provide the final arrangement, technical and financial specification and other specific details pertaining to its generation facility before its commercial operation date (COD)."*

NEPRA, therefore, has recognized and acknowledged that the specifications provided by a company at the time of submission of its application for grant of a generation license are mostly tentative / indicative and may require amendments at a later stage. Further, similar to the generation license of HSRPEPL, Article 3.3 of the Generation License in our case envisages that the Company will provide the "final arrangement, technical...specifications and other specific details pertaining to its generation facility" before COD.

Consistent with NEPRA determination in the matter of HSRPEPL's modification application and Article 3.3 of the Generation License, the Company is hereby requesting modification of its Generation License in light of the actual design of the power plant and the data provided and instructions received by the Company from the manufacturer.

In addition to the above, we set out below the specific reasons for each modification requested by the Company from NEPRA:

3.1 Rationale for Modification to the Ramping Rates

Modification to the Ramping rates is necessary because:

a. The operation life span of steam turbine cylinder may be seriously impacted due to the excessive change rate of load and temperature. Furthermore, the Ramping rate at various operation conditions shall be limited within the metal temperature increase rate range of cylinder. Therefore, the modification to the Ramping rate, set out in paragraph 2.1 above, has been proposed in light of the manufacturer's recommendation to ensure safe and efficient operation of the power plant.

b. If the Ramping rate is not modified, it will cause an adverse change in the airflow, amount of coal, fineness of pulverized coal, concentration of pulverized coal and quantity of water into the boiler furnace, which may impact the boiler heat absorption, and may cause a substantial change in the boiler main steam temperature and pressure, reheat steam temperature, which will result in pressure rise. Under these circumstances, the boiler may overheat or leak. Furthermore, the operational life span of turbine may be affected due to the excessive heat stress on the cylinder metal.

c. If the Ramping rate is not modified, it will result in combustion instability due to excessive variation on coal fineness and concentration into the boiler, caused by excessive load change rate, which may lead to partial choking in the boiler or boiler shut down, and may result in excessive flue gas emissions.

d. The intermediate storage type coal pulverizing system is equipped with a pulverized coal bin to store qualified coal powder. When the load increases, the stored pulverized coal is directly sent into the furnace to respond quickly to the load requirement. While the direct blowing pulverizing system has no storage equipment, which needs to produce the qualified coal powder in the coal mill in real time for the boiler, to respond to the load requirement. Accordingly, the Ramping rate of intermediate storage type coal pulverizing system could be much higher within 2% and direct blowing pulverizing system shall be limited within 1%. Direct blowing pulverizing system is equipped in Port Qasim Power Plant and all the mills shall start up one by one, which will cost more time to reach full load and result in the limited Ramping rate.

In view of above, the Ramping rate of Port Qasim Power Plant shall be limited within 1%. The Chinese standards and the manufacturer's certificate justifying the proposed modifications to the Ramping rates are attached herewith as Annexes 1 and 2.

3.2 Rationale for Modification to the Time required for Synchronization to the Grid

The following modifications to the time required for synchronization to the Grid are based on the technical requirements of the manufacture's technical specification (set out in Annex 2 of this Application), and take into consideration the efficient and safe operation of the plant:

More than 150 hours: 420 minutes (including boiler hot washing time 100 minutes) is required for boiler to set up temperature and pressure after the success ignition; 40 minutes is required for steam turbine rush to 1500rpm and 370 minutes for turbine equipment warming in medium speed; 30 minutes is required from 1500rpm to speed up to 3000rpm and 10 minutes for turbine equipment warming again at 3000rpm; Then, 30 minutes is required for synchronize to grid. Therefore, total 900 minutes is required for unit start-up.

More than 32 hours less than 150 hours: 410 minutes (including the boiler hot washing time of 100 minutes) is required for boiler to set up temperature and pressure after the success ignition; 30 minutes is required for steam turbine rush to 1500rpm and 100 minutes for turbine equipment warming in medium speed; 20 minutes is required from 1500rpm to speed up to 3000rpm; Then, 20 minutes is required for synchronize to grid. Therefore, total 580 minutes is required for unit start-up.

More than 8 hours less than 32 hours: 410 minutes (including the boiler hot washing time of 100 minutes) is required for boiler to set up temperature and pressure after the success ignition; 30 minutes is required for steam turbine rush to 1500rpm; 20 minutes is required from 1500rpm to speed up to 3000rpm; Then, 20 minutes is required for synchronize to grid. Therefore, total 480 minutes is required for unit start-up.

More than 2 hours less than 8 hours: 220 minutes is required for boiler to set up temperature and pressure after the success ignition; 30 minutes is required for steam turbine rush to 3000rpm; Then, 20 minutes is required for synchronize to grid. Therefore, total 270 minutes is required for unit start-up.

Not more than 2 hours: 150 minutes is required for boiler to set up temperature and pressure after the success ignition; 30 minutes is required for steam turbine rush to 3000rpm; Then, 20 minutes is required for synchronize to grid. Therefore, total 200 minutes is required for unit start-up.

In support of the proposed modification to the Generation License, reliance is also placed on the following documents which form an integral part of this Application:

Annex 1: The Chinese Standard supporting proposed modification of License;

Annex 2: The Certificate of Ramping Rate and Time Required to Synchronize issued by Dongfang Electric Corporation Dongfang Turbine Co., Ltd. (the Manufacturer);

Annex 3: Relevant data submitted by other coal-fired power plants approved by NEPRA;

Annex 4: NEPRA's determination of the HSRPEPL's generation license modification application.

4. IMPACT OF THE PROPOSED MODIFICATION ON THE TARIFF, QUALITY OF SERVICE, AND PERFORMANCE OF THE COMPANY OF ITS OBLIGATIONS UNDER THE GENERATION LICENSE

4.1 Impact of the Proposed Modification on the Tariff

The Company has opted for upfront coal tariff, for 2 x 660 MW Coal Powered Plant, issued by NEPRA. Since the upfront tariff is a fixed tariff, the proposed modification to the Company's Generation License will have no impact on the tariff.

4.2 Impact of the Proposed Modification on Quality of Service

The Company hereby certifies that the Upfront Tariff and the obligations enunciated in the Generation License are fully acceptable to the Company and that the proposed modification will not impact the quality of service. Rather, the modification is necessary as explained above in order to avoid any impairment in the quality of service.

4.3 Impact of the Proposed Modification on the Performance of the Company of Its Obligations under the Generation License

For the reasons explained above, the proposed modification would facilitate the Company in fulfilling its obligations under the Generation License.

It is further submitted that the proposed modification may be accepted as it:

(a) does not cause NEPRA to act or acquiesce in any act or omission of the licensee in a manner contrary to the provisions of the Regulation of the Generation, Transmission and Distribution of Electric Power Act, 1997 or the rules or regulations framed thereunder;

(b) is beneficial to the consumers as it will ensure safe and efficient operation of the power plant;

(c) is reasonably necessary for the Company to effectively and efficiently perform its obligations under the Generation Licence;

(d) is reasonably necessary to ensure the continuous, safe and reliable supply of electric power to the consumers keeping in view the financial and technical viability of the Company; and

(e) is in accordance with the design requirements of the manufacturer, as certified by the manufacturer as per Annex 2.

5. PRAYER

In view of the above, it is hereby most respectfully requested that NEPRA may kindly:

(i) accept the proposed modification to the Generation License to ensure safe and efficient operation of the Company's 1320 MW power plant;

(ii) treat the Company's request for modification to the Generation License on a nondiscriminatory basis; and

(iii) grant such other relief as NEPRA may deem appropriate in the circumstances.

Annex 1
Chinese Standard supporting proposed modification of License

华中电监市场价财〔2011〕200号

关于印发《华中区域并网发电厂辅助服务管理实施细则》和《华中区域发电厂并网运行管理实施细则》的通知

河南、湖南、四川电监办，华中电网公司，河南、湖北、湖南、江西、四川省电力公司，重庆市电力公司，各有关发电企业：

《华中区域并网发电厂辅助服务管理实施细则(试行)》及《华中区域发电厂并网运行管理实施细则(试行)》(以下简称《两个细则》)经过一年多的试行，初步规范了华中区域电力调度行为，提高了发电企业运行管理水平和参与辅助服务的积极性，在保证电力系统安全稳定运行方面发挥了显著作用。华中电监局在总结前期试运行经验，广泛听取各电力企业意见的基

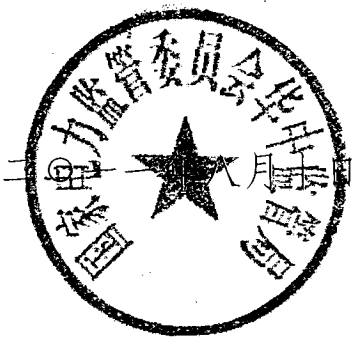
础上，组织修订相关条款，形成《华中区域并网发电厂辅助服务管理实施细则》和《华中区域发电厂并网运行管理实施细则》，现予以印发，请遵照执行。

修订后的《两个细则》于2011年9月1日起正式实施，请各电网企业在8月30日前完成技术支持系统的修改及调试工作。

《两个细则》实施工作过程中遇到问题请及时向华中电监局市场与价财监管处反馈。联系人：董小寒 027-88717615。

附件：1.《华中区域并网发电厂辅助服务管理实施细则》

2.《华中区域发电厂并网运行管理实施细则》



主题词：发电　并网管理　细则　通知

抄送：国家电监会市场监管部。

国家电监会华中监管局办公室　　2011年8月10日印发

1h

1、AGC 的月投运率必须达到 90％以上。每低于 1 个百分点（含不足一个百分点），每台次记考核电量 5 万千瓦时。经调度机构同意退出的时间段，不纳入考核范围。

2、具备 AGC 功能的机组，应按调度指令要求投入 AGC，无法投入 AGC 功能或 AGC 调节性能不满足表 2、表 3 中任一项基本要求，每日按 5 万千瓦时记为考核电量。每月由电力调度机构对所有机组 AGC 控制单元的调节性能进行测试，测试结果及时在“三公”调度网站上公布，并报电力监管机构备案。

表 2　火电机组 AGC 调节性能要求

额定容量	调节范围下限（额定容量的百分数）	调节范围上限（额定容量的百分数）	调节速度（每分钟额定容量的百分数）	调节精度
100MW（含）～200MW	75％	100％	2.0％/Min	±3％
200MW（含）～300MW	66％	100％	2.0％/Min（直吹式制粉系统机组为 1％/Min）	±3％
300MW（含）～600MW	60％	100％	2.0％/Min（直吹式制粉系统机组为 1％/Min）	±3％
600MW 及以上	55％	100％	2.0％/Min（直吹式制粉系统机组为 1％/Min）	±3％

表 3　水电机组 AGC 调节性能要求

调节形式	调节范围下限（额定容量的百分数）	调节范围上限（额定容量的百分数）	调节速度（每分钟额定容量的百分数）	调节精度
全厂方式	机组最低振动区上限	100％	最大机组的 80％/Min	±3％
单机方式	最低振动区上限	100％	60％/Min	±3％

HZDJSCJC [2011] No.200

CIRCULAR ON ISSUING IMPLEMENTATION RULES FOR AUXILIARY SERVICE MANAGEMENT OF GRID-CONNECTED POWER PLANTS IN CENTRAL CHINA AND IMPLEMENTATION RULES FOR MANAGEMENT OF GRID-CONNECTED OPERATION OF POWER PLANTS IN CENTRAL CHINA

To Henan Electric Power Regulation Office, Hunan Electric Power Regulation Office, Sichuan Electric Power Regulation Office, Central Power Grid Company, Henan Electric Power Company, Hubei Electric Power Company, Hunan Electric Power Company, Jiangxi Electric Power Company, Sichuan Electric Power Company, Chongqing Electric Power Company, and all related power plants:

The Implementation Rules for Auxiliary Service Management of Grid-connected Power Plant in Central China (Trial) and Implementation Rules for Management of Grid-connected Operation of Power Plants in Central China (Trial), after one year's trial operation, have regulated preliminarily the electric power dispatch in Central China, increased the operation management level of power plants and their enthusiasm in providing auxiliary services, playing an important role in guaranteeing operation safety and stability of electric power system. Based on the trial operation experience in the past year and by referring to the suggestions and advice provided by the related power plants, Central China Electric Power Regulation Bureau has organized to revise the terms in these two implementation rules and finalized the Implementation Rules for Auxiliary Service Management of Grid-connected Power Plant in Central China and Implementation Rules for Management of Grid-connected Operation of Power Plants in Central China (collectively the "Revised Rules").

The Revised Rules are hereby issued to all of you to be complied with. The Revised Rules will come into force on September 1, 2011, all related power plants and companies are required to complete modification and commissioning of technical support systems before August 30.

For any problem found during implementation of the Revised Rules, please give feedback to the Market and Price Regulation Office. Contact: Dong Xiaohan; Tel: 027-88717615.

Annex 1: Implementation Rules for Auxiliary Service Management of Grid-connected Power Plant in Central China; and
Annex 2: Implementation Rules for Management of Grid-connected Operation of Power Plants in Central China.

Under the seal of
Central China Regulatory Bureau of State Electricity Regulatory Commission

2. For units with AGC, AGC should be put into operation as required by the dispatch instructions. If AGC cannot be put into operation or the regulation performance of AGC fails to meet the basic requirement in Table 2 or Table 3, penalty is imposed according to relevant regulations. The electric power dispatch organization tests the regulating performance of AGC control units of all units each month, publishes the test results on the open, fair, and just despatch website, and reports to the electric power regulation authority for filing.

Table 2 Requirements for Regulation Performance of AGC of Thermal Power Units

Rated Capacity	Lower Limit of regulating Range (percentage in rated capacity)	Upper limit of Regulating Range (percentage in rated capacity)	Regulating Speed (percentage in rated capacity)	Regulating Accuracy (percentage in rated capacity)
100MW (inclusive) ~200MW	75%	100%	2.0%/Min	±3%
200MW (inclusive) ~300MW	66%	100%	2.0%/Min (1%/Min for unit with direct-fired pulverizing system)	±3%
300MW (inclusive) ~600MW	60%	100%	2.0%/Min (1%/Min for unit with direct-fired pulverizing system)	±3%
600MW and above	55%	100%	2.0%/Min (1%/Min for unit with direct-fired pulverizing system)	±3%

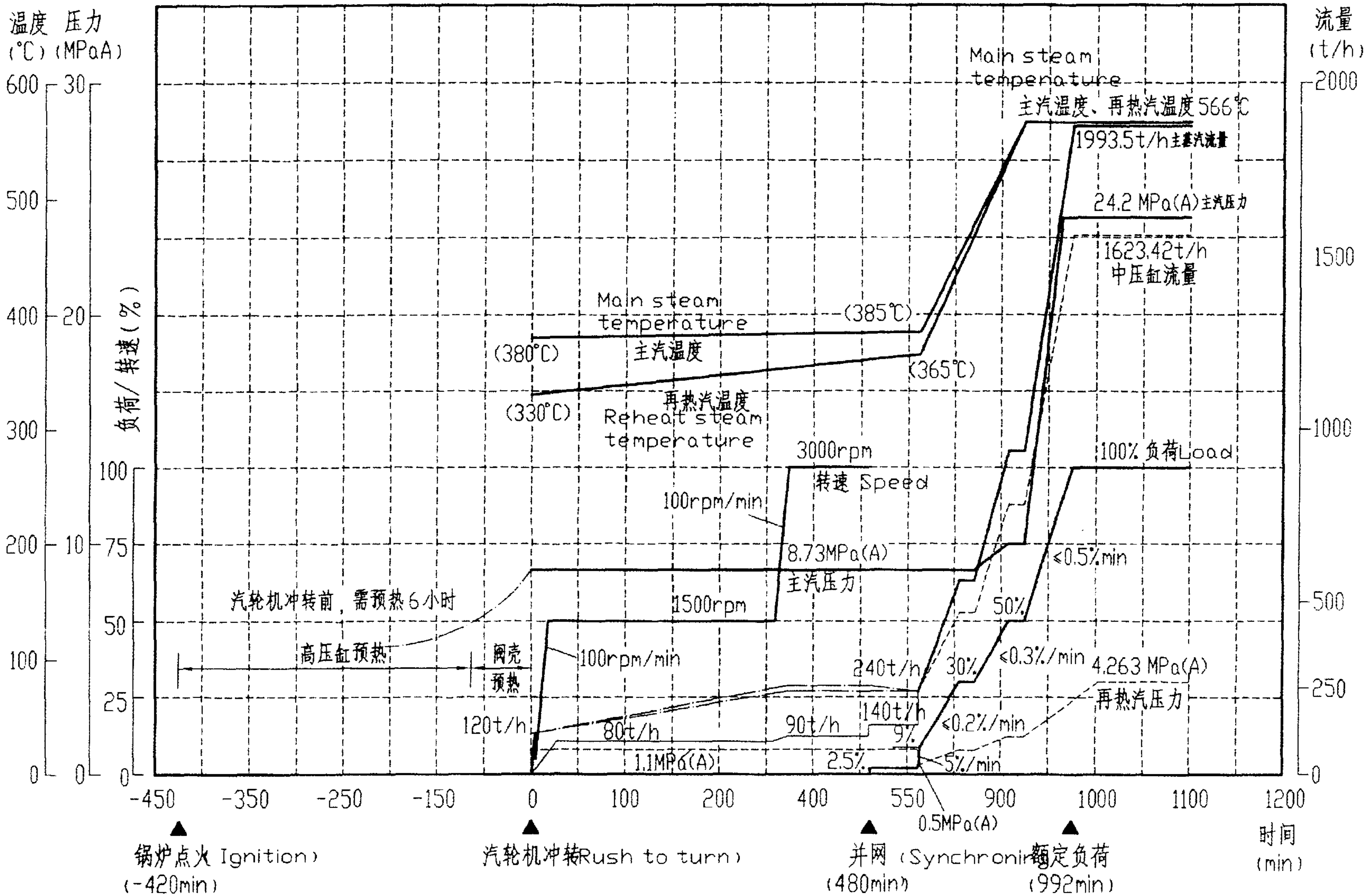
Table 3 Requirements for AGC Regulating Performance of Hydraulic Power Units

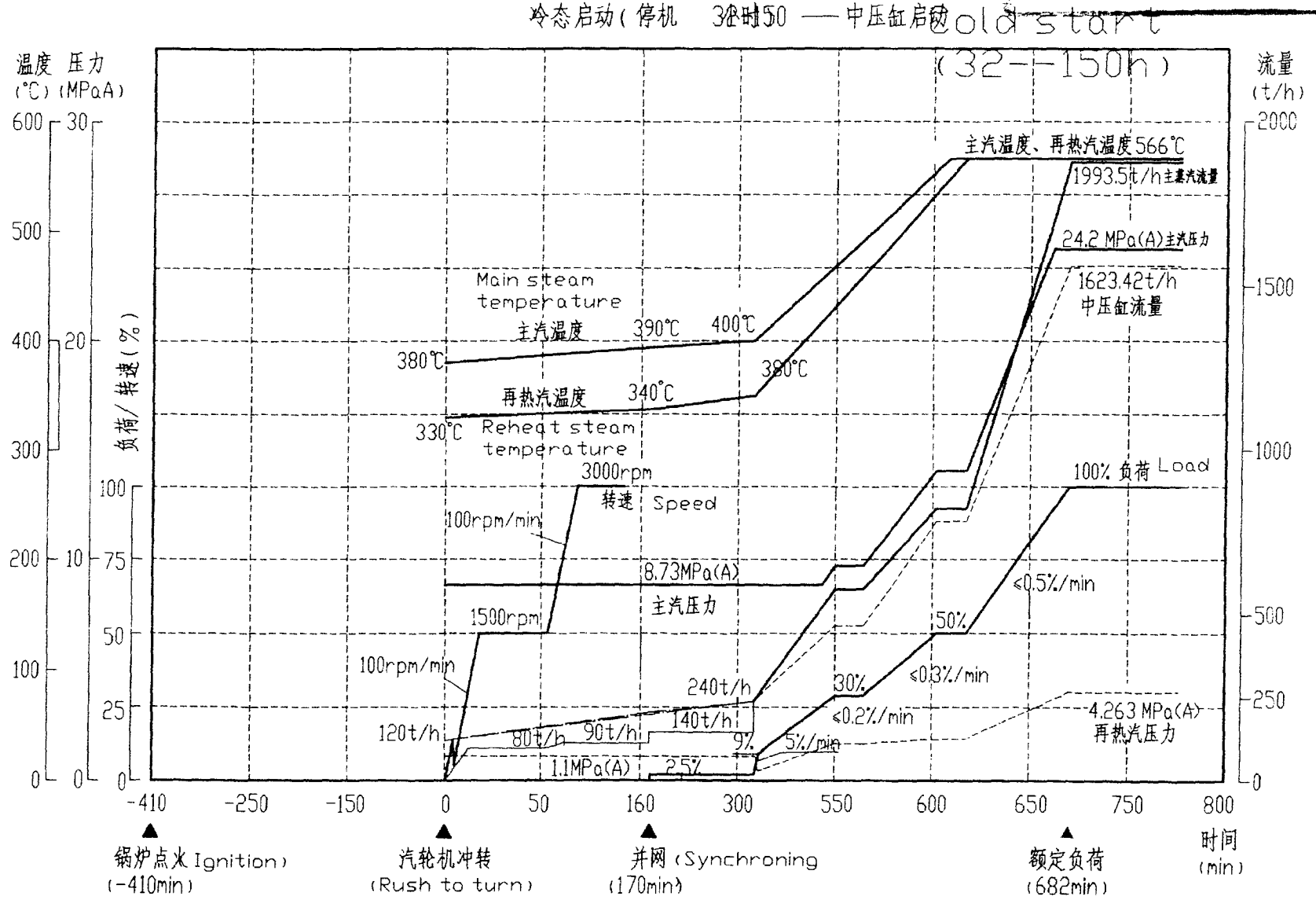
Regulating Type	Lower Limit of Regulating Rang(percentage in rated capacity)	Upper limit of Regulating Range (percentage in rated capacity)	Regulating Speed (percentage in rated capacity per each minute)	Regulating Accuracy
For whole power plant	Upper limit of minimum vibration zone of unit	100%	80% of the maximum unit/Min	±3%
For single unit	Upper limit of minimum vibration zone	100%	60%/Min	±3%

Annex 2
Certificate of Ramping Rate and Time Required to Synchronize issued by Dongfang Electric Corporation Dongfang Turbine Co., Ltd. (the Manufacturer)

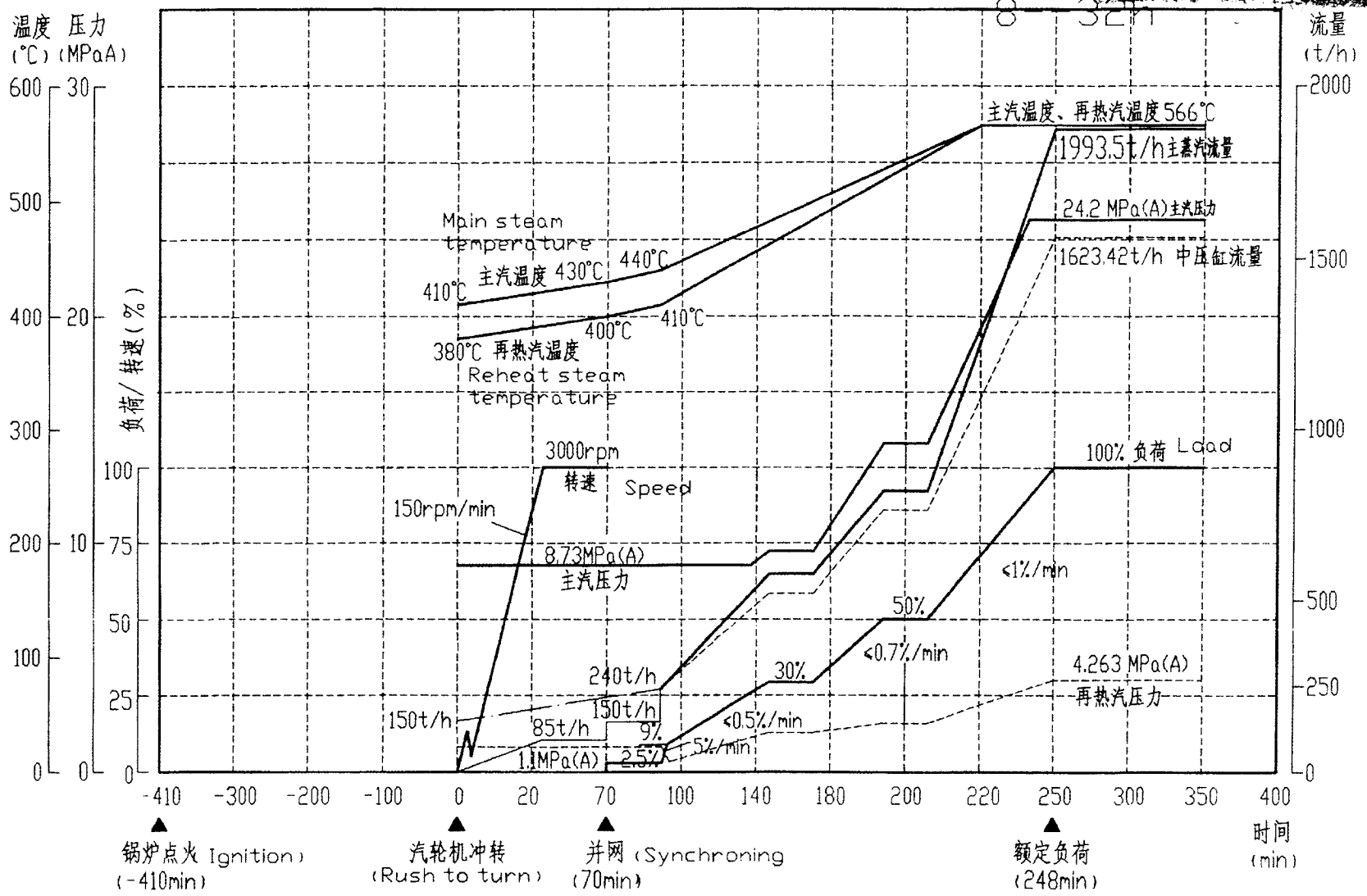
工程施工设计用资料专用章
日期 签名
东方电气集团东方汽轮机有限公司

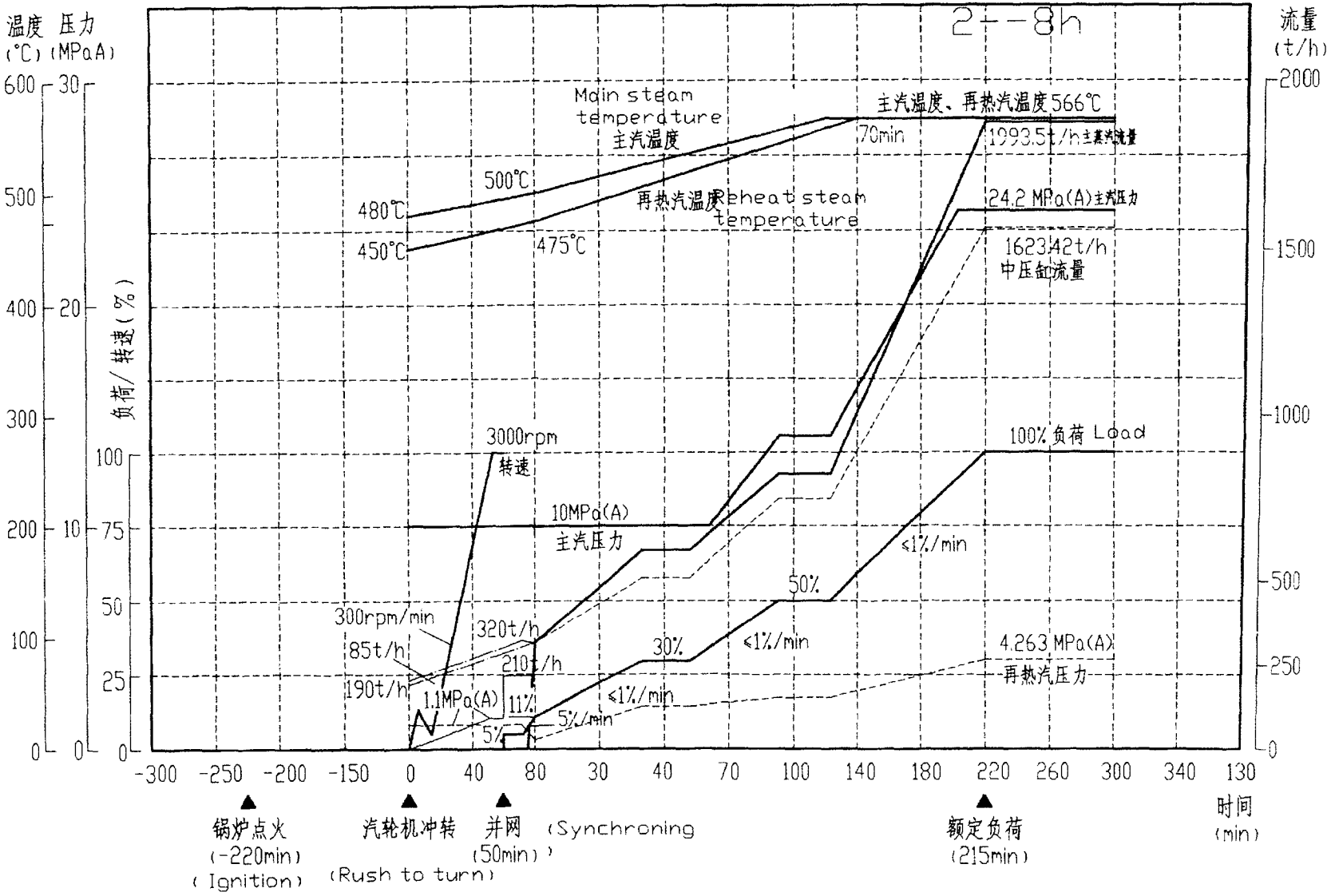
冷态启动(Cold start)— 中压缸启动 >150h)

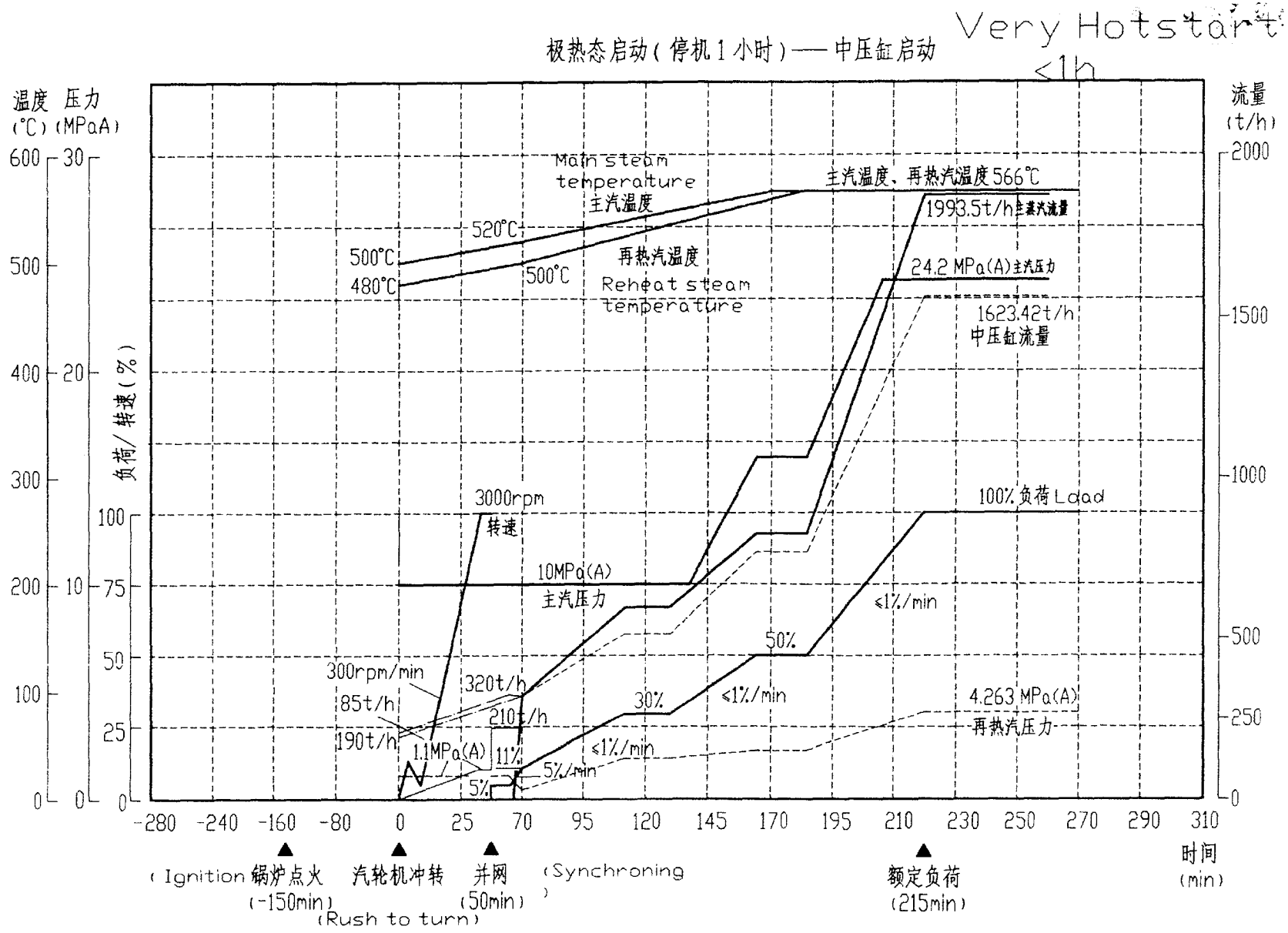




温态启动（停机 8时） —中压缸启动 Warm start




热态启动（停机 小时） — 中压缸启动 Hotstart
2--8h
温度 压力
(℃) (MPaA)
负荷/转速(%)
流量
(t/h)
Main steam temperature
主汽温度
主汽温度、再热汽温度566℃
70min
1093.5t/h主蒸汽流量
500℃
480℃
450℃
475℃
再热汽温度 reheat steam temperature
24.2 MPa(A)主汽压力
1623.42t/h
中压缸流量
3000rpm
转速
10MPa(A)
主汽压力
100% 负荷 Load
≤1%/min
50%
300rpm/min
85t/h
190t/h
320t/h
210t/h
30%
≤1%/min
4.263 MPa(A)
再热汽压力
1.1MPa(A)
11%
5%
≤1%/min
5%/min
时间
(min)
锅炉点火
(-220min)
(Ignition)
汽轮机冲转
(Rush to turn)
并网
(50min)
(Synchroning)
额定负荷
(215min)


极热态启动（停机1小时）——中压缸启动
Very Hotstart
<1h
温度 压力
(℃) (MPaA)
流量
(t/h)
负荷/转速(%)
Main steam temperature
主汽温度
主汽温度、再热汽温度566℃
520℃
500℃
480℃
500℃
再热汽温度
Reheat steam temperature
1993.5t/h主蒸汽流量
24.2 MPa(A)主汽压力
1623.42t/h
中压缸流量
3000rpm
转速
10MPa(A)
主汽压力
100%负荷Load
≤1%/min
50%
300rpm/min
320t/h
85t/h
210t/h
30%
≤1%/min
4.263 MPa(A)
再热汽压力
190t/h
1.1MPa(A)
11%
≤1%/min
5%/min
5%
时间
(min)
(Ignition 锅炉点火
(-150min)
(Rush to turn)
汽轮机冲转
并网
(50min)
(Synchroning)
额定负荷
(215min)

Annex 3
Relevant data submitted by other coal-fired power plants approved by NEPRA

National Electric Power Regulatory Authority
Islamic Republic of Pakistan

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad
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Registrar

No. NEPRA/R/DL/LAG-361/687-94

February 01, 2017

Mr. Mustafa Bilwani,
Chief Executive Officer,
ThalNova Power Thar (Pvt.) Limited,
Ground Floor, G&T Tower # 18,
Beaumont Road, Civil Lines-10,
Karachi.

Subject: **Generation Licence No. IGSPL/75/2017**
Licence Application No. LAG-361
ThalNova Power Thar (Pvt.) Limited (TNPTPL)

Reference: *Your application vide letter No. TN/01/0012/08-2016, dated August 10, 2016, received on August 11, 2016.*

Enclosed please find herewith Generation Licence No. IGSPL/75/2017 granted by National Electric Power Regulatory Authority (NEPRA) to ThalNova Power Thar (Pvt.) Limited (TNPTPL), for its 330.00 MW Indigenous/Thar Coal based Thermal Generation facility located near Islamkot, Thar Coal Block-II, District Tharparker, in the province of Sindh, pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997). Further, the determination of the Authority in the subject matter is also attached.

2. Please quote above mentioned Generation Licence No. for future correspondence.

Enclosure: Generation Licence (IGSPL/75/2017)

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

01.02.17

(Syed Safeer Hussain)

Copy to:

1. Secretary, Ministry of Water and Power, A-Block, Pak Secretariat, Islamabad.
2. The Secretary, Energy Department, Government of Sindh, 3rd Floor, State Life Building No. 03, Opp: CM Secretariat, Karachi
3. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore.
4. Managing Director, Private Power and Infrastructure Board (PPIB), Ground & Second Floors, Plot No. 10, Mauve Area, Sector G-8/1, Islamabad.
5. Chief Executive Officer, Central Power Purchasing Agency Guarantee Limited (CPPAG), 6th Floor, Shaheed-e-Millat Secretariat, Jinnah Avenue, Blue Area, Islamabad.
6. Director General, Environment and Alternative Energy Department, Government of Sindh, Plot No ST/2/1, Sector 23, Korangi Industrial Area, Karachi.
7. Chief Secretary, Government of Sindh, Sindh Secretariat, Karachi.

	Tanks/Open Yard	87,500 Ton	87,500 Ton	Approx. 600M^3
(viii).	Gross Storage	Primary Fuel	Alternative Fuel	Start-Up Fuel
		Approx. 175,000 Ton	Approx. 175,000 Ton	1200 M^3

(D). Emission Values

		Primary Fuel	Alternative Fuel	Start-Up Fuel
(i).	SO_x (mg/Nm^3)	<850	<850	<850
(ii).	NO_x (mg/Nm^3)	<510	<510	<510
(iii).	Particulate Matter (mg/Nm^3)	<100	<100	-

(E). Cooling System

(i).	Cooling Water Source/Cycle	Water from Left Bank Outfall Drainage-LBOD (Primary Source) and ground/well water pumped out of the mining area/other area (Backup Source)/Close cycle cooling system

(F). Plant Characteristics

(i).	Generation Voltage	21KV
(ii).	Frequency	50Hz
(iii).	Power Factor	0.8 to 0.85 (lagging) /0.95(leading)
(iv).	Automatic Generation Control (AGC) (MW control is the general practice)	Yes
(v).	Ramping Rate (MW/min)	0.5-1% rated load (3.3-6.6MW/Minute depending upon nature of start up and regular operational conditions.
(vi).	Time required to Synchronize to Grid (Hrs.)	3-12 Hrs depending upon the nature of startup

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Islamic Republic of Pakistan

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Registrar

No. NEPRA/R/DL/LAG-338/ 249-57

January 05, 2017

Mr. MengDonghai,
Chief Executive Officer,
Thar Coal Block-1 Power Generation Company (Pvt.) Limited,
House No. 20/1, 21st Street, Khayaban-e-Tanzeem, Phase V,
DHA, Karachi.

Subject: **Generation Licence No. IGSPL/74/2017**
Licence Application No. LAG-338
Thar Coal Block-1 Power Generation Company (Pvt.) Limited (TCBPGCPL)

Reference: Your application vide letter No. Nil, dated March 08, 2016, received on March 11, 2016.

Enclosed please find herewith Generation Licence No. IGSPL/74/2017 granted by National Electric Power Regulatory Authority (NEPRA) to Thar Coal Block-1 Power Generation Company (Pvt.) Limited, for its 1320.00 MW Indigenous/Thar Coal based Thermal Generation facility located at Thar Coal Block-1, District Thar, in the province of Sindh, pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997). Further, the determination of the Authority in the subject matter is also attached.

2. Please quote above mentioned Generation Licence No. for future correspondence.

Enclosure: Generation Licence (IGSPL/74/2017)

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
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05.01.17

(Syed Safeer Hussain)

Copy to:

1. Secretary, Ministry of Water and Power, A-Block, Pak Secretariat, Islamabad.
2. Chief Executive Officer, Hyderabad Electric Supply Company Limited (HESCO), Old State Bank Building, G.O.R Colony, Hyderabad.
3. Chief Executive Officer, Sukkur Electric Supply Company (SEPCO), Old Thermal Power Station, Sukkur.
4. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore.
5. Managing Director, Private Power and Infrastructure Board (PPIB), Ground & Second Floors, Plot No. 10, Mauve Area, Sector G-8/1, Islamabad.
6. Chief Executive Officer, Central Power Purchasing Agency Guarantee Limited (CPPAG), 6th Floor, Shaheed-e-Millat Secretariat, Jinnah Avenue, Blue Area, Islamabad.
7. Director General, Environment [illegible] Alternative Energy Department, Government of Sindh, Plot No. 5/1/2, [illegible], Karachi.
8. Chief Secretary, Government of [illegible], Karachi.

(v).	Ramping Rate (MW/min)	0.5-1%rated load (3.3-6.6MW/Minute). This figure is indicative and will be confirmed after engineering design of the plant
(vi).	Time required to Synchronize to Grid (Hrs.)	5 minutes. This figure is indicative and will be confirmed after engineering design of the plant

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Registrar

No. NEPRA/R/DL/LAG-285/ 4034-39

March 18, 2015

Mr. Shamsuddin A. Shaikh
Chief Executive Officer
Engro Powergen Thar (Pvt.) Limited
4th Floor, The Harbor Front Building,
HC-3, Marine Derive, Block 4,
Clifton, Karachi-75600

Subject: **Generation Licence No. IGSPL/49/2015**
Licence Application No. LAG-285
Engro Powergen Thar (Pvt.) Limited

Reference: Your letter No. EPTL-001-11/2014, dated December 02, 2014.

Enclosed please find herewith Determination of the Authority in the matter of Generation Licence Application of Engro Powergen Thar (Pvt.) Limited (EPGTPL) along with Generation Licence No. IGSPL/49/2015 annexed to this determination granted by the National Electric Power Regulatory Authority to EPGTPL for its 660.00 MW indigenous coal based thermal generation facility located at 5.0 KM from Thar Block-II of Thar Coalfields, District Tharparker, Sindh, pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).

2. Please quote above mentioned Generation Licence No. for future correspondence.

Enclosure: **Generation Licence (IGSPL/49/2015)**

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY * NEPRA * REGISTRAR

18.03.15

(Syed Safeer Hussain)

Copy to:

1. Managing Director, Private Power & Infrastructure Board, 50-Nazimduddin Road, F-7/4, Islamabad
2. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore
3. Chief Operating Officer, CPPA, 107-WAPDA House, Lahore
4. Chief Executive Officer, Hyderabad Electric Supply Company, WAPDA Water Wing Complex, Hussainabad, Hyderabad
5. Director General, Sindh Environmental Protection Agency, Plot No. ST 2/1, Sector 23, Korangi Industrial Area, Karachi

(F). Plant Characteristics

(i).	Generation Voltage	20 KV (Transmission Voltage 500 kV)
(ii).	Frequency	50Hz
(iii).	Power Factor	0.8 (lagging) /0.95(leading)
(iv).	Automatic Generation Control (AGC) (MW control is the general practice)	Yes
(v).	Ramping Rate (MW/min)	0.5~1% rated load (1.65~3.3MW/Minute). This figure is indicative and will be confirmed after engineering design of the plant.
(vi).	Time required to Synchronize to Grid (Hrs.)	8 hours for cold start (this time is considering steam turbine cold start). This figure is indicative and will be confirmed after engineering design of the plant.

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Annex 4
NEPRA's determination of the HSRPEPL's generation license modification application

National Electric Power Regulatory Authority
Islamic Republic of Pakistan

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad.
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Registrar

No. NEPRA/R/LAG-292/7985-87 October 27, 2017

Mr. Song Taiji,
Chief Executive Officer,
Hauneng Shandong Ruyi (Pakistan) Energy (Private) Limited,
House No. 105, Street 10,
Block H, Phase 5, DHA,
Lahore.

Subject: **Modification-I in Generation Licence No: IGSPL/60/2015**
Licence Application No. LAG-292
Huaneng Shandong Ruyi (Pakistan) Energy (Private) Limited (HSRPEPL)

Reference: HSRPEPL's application vide letter dated August 16, 2017 (received on August 17, 2017).

It is intimidated that the Authority has approved "Licensee Proposed Modification" in Generation Licence No. IGSPL/60/2015 in respect of Huaneng Shandong Ruyi (Pakistan) Energy (Private) Limited (HSRPEPL), pursuant to Regulation 10(11)(a) of the NEPRA Licensing (Application and Modification Procedure) Regulations 1999.

2. Enclosed please find herewith determination of the Authority in the matter of Licensee Proposed Modification in the Generation Licence of HSRPEPL along with Modification-I in the Generation Licence No. IGSPL/60/2015, as approved by the Authority.

Encl: As above

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

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(Syed Safeer Hussain)

Copy to:

1. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore
2. Chief Executive Officer, CPPA-G, 6th Floor, Shaheed-e-Millat Sectariat, Jinnah Avenue, Blue Area, Islamabad.
3. Chief Executive Officer, Multan Electric Power Company (MEPCO), NTDC Colony, Khanewal Road, Multan.
4. Director General, Environment Protection Department, Government of Punjab, National Hockey Stadium, Ferozpur Road, Lahore.

(ii). In the text of the proposed modification, HSRPEPL proposed to modify the ramping rate (MW/min) and time required to synchronize to Grid (HRs) in its generation licence as given below:

Ramping Rate

Unit load range % age	Cold Start (%MW/Min)	Warm Start (%MW/Min)	Hot Start (%MW/Min)
0—<25%	0.2	0.6	1
25— 50%	0.3	0.8	1
50— 100%	0.3	0.3	0.8

Time required to Synchronize to Grid

Time required to synchronize to Grid (Min.)	Cold start	Warm start	Hot start	Very hot start
	600	480	150	90

(iii). Regarding "statement of the reasons in support of the modification", HSRPEPL, *inter alia*, stated that China-Pakistan Economic Corridor ("CPEC") being the Government of Pakistan's ("GOP") top priority has meant significant pressure on CPEC's early harvest projects to be completed at a rapid pace. The project being an early harvest project faced similar pressure and the push to meet the exacting pace resulted in an oversight by the company. This oversight caused erroneous performance data for the ramping rate and the consequent incorrect time required to synchronize to grid being approved in the generation licence. Notwithstanding to the said, higher ramping rate can be achieved using check coal with low calorific value of 4300 kCal/kg. However, NEPRA has fixed minimum calorific value of 5500 Kcal/kg for the plant and present combustion system of the plant cannot support the ramping rate using coal with 5500 Kcal/kg calorific value.

(iv). About "statement of the impact on the tariff, quality of service and the performance by the Licensee of its obligations under the licence", HSRPEPL submitted that the tariff, quality of service and the performance of the company of its obligations under the generation licence will not be affected by the proposed modification.

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by one from initial load to full load and each mill needs some time to start up which causes gradual ramping. In view of the said, PPDB has supported the LPM;

(b). CPPA-G submitted that review of rational for the proposed modification reveals that HSRPEPL has failed to meet requisite design criteria and technical limits as per its generation licence, hence seeking amendments. This kind of practice if allowed will encourage the IPPs to install equipment of their choice and thereafter asking for modification in design parameters. With lower ramping rate the plant will require more time to comply with dispatch instructions. Further, decreasing ramping rate will cause increase in startup cost, as star up cost calculation takes care of quantity of diesel fuel during the startup process thus financial impact. NEPRA has allowed partial load adjustment on the revised contract heat rate, therefore power purchaser has to pay additional payments on account of Partial Load Adjustment Charges (PLAC) for extended ramping period which will ultimately be passed on to the end consumer. Startup time should be on lower side for efficient despatch of the complex. CPPA-G is of the view that even if NEPRA allows ramp time as requested by HSRPEPL, those ramp rates should be limited to the startup process only and for normal operation of the plant, where the system operator demands variation in load, the ramping rate should not be less than 3.0% per minute. CPPA-G supported its concerns regarding the ramping rate and startup time with documentary evidences. However, later on CPPA-G clarified that the documents are mainly based on European standards whereas the plant of HSRPEPL is being commissioned as per Chinese standards. Therefore, CPPA-G is of the view that while determining the ramping rate and time to synchronize with the grid, Chinese standards may also be taken into consideration;

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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considered appropriate seeking perspective of the licensee/HSRPEPL on the observations of CPPA-G.

(iii). On the comments of CPPA-G, HSRPEPL submitted that equipments of the plant were designed according to the parameters enunciated in the feasibility study and the procurement on the relative design finished by the end of 2015. However, the Authority in its determination regarding fuel price adjustment of the project dated September 23, 2016 fixed the minimum calorific value of coal to 5500kCal/kg. Consequently, the HSRPEPL began to modify its equipment to ensure compliance but in the short term, it has been left with a limited window for procurement of coal due to the scarcity of coal that meets all the conditions of tariff as well as feasibility study. In the said determination, the Authority admitted that before fixing the minimum calorific value for coal power plant, some key factors like availability of good quality of coal and others should be considered. The Authority acknowledged the fact that for compliance to revised calorific value, power plant current design need to be changed which is not feasible for HSRPEPL due to early procurement of all major equipment of the project.

(iv). HSRPEPL has submitted that according to the PPA, it shall provide the data as per manufacturer/EPC loading curves for the complex. If the ramping rate is higher than ramping curves of the complex, the temperature deviation would be enormously high that is a serious risk for different boiler parts and tubes causing degradation of equipment's life as there are metallurgical constraints. Furthermore, frequent high deviation from the normal ramping rate causes slag accumulation inside the furnace which will ultimately damage boiler's water walls and super heater. In view of the said, HRSPEPL is of the view that the ramping rate and the required time to synchronize to grid as mention in the generation licence are on extreme side which are achievable only in case of emergency, but during normal operation the unit should comply with the manufacturer data as the complex/unit works in base load and forbids to operate beyond 1% during normal operation.

(v). On the observation regarding financial impact of the proposed modification, HSRPEPL submitted that in view of the free start-up times for different start-up type proposed by CPPA-G, the company can hardly meet [illegible]

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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manufacturer data. Otherwise, if the unit changes its load above the rated ramping rate, it will result in excessive temperature and erosion thereby decaying overall life of the unit. In order to support it stance, HSRPEPL submitted documentary evidences/certificates from the equipment manufacturers and independent engineers.

(viii). The Authority considered the above reply of HSRPEPL to the comments of CPPA-G and found the same plausible. Further, the Authority also observed that CPPA-G and AKLA have raised certain queries mainly relating to the expected impact of the proposed LPM on the tariff (in terms of startup cost and PLAC). In this regard, the Authority observes that through its determination No. NEPRA/TRF-308/HSRPEL-2015/4385-4387 March 31, 2015, it has already granted an imported coal upfront tariff to HSRPEPL. Further, the generation facility/power plant of HSRPEPL will be operated as base load plant and there will be no frequent startups and partial loading. In addition there is also provision for free starts. Therefore, the Authority considers that impact of the proposed modification on tariff is negligible. In view of the said, the Authority decided to proceed further with the communicated LPM as stipulated in the Licensing Regulations and the NEPRA Licensing (Generation) Rules, 2000 (the "Generation Rules").

(E). Evaluation of the Case

(i). The Authority has examined the entire case in detail including the already granted generation licence and information submitted along with the application of LPM, comments of the stakeholders, replies of HSRPEPL and relevant rules & regulations.

(ii). In this regard, the Authority observes that in terms of Regulation-10(5) of the Licensing Regulations, the Authority is entitled to modify a licence in accordance with an authority proposed modification or LPM, subject to and in accordance with such further changes as the Authority may deem fit if, in the opinion of the Authority such modification (a). does not adversely affect the performance by the licensee of its obligations; (b). does not cause the Authority to act or acquiesce in any act or omission of the licensee in a manner contrary to the

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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later stages, according to the manufacturer provided data. It is relevant to mention here that this issue has been considered in the generation licences and accordingly a sub-article has been added in the generation licences. In article 3.3 of the existing generation licence of HSRPEPL the licensee has been directed to provide the final arrangement, technical and financial specification and other specific details pertaining to its generation facility before its commercial operation date (COD). HSRPEPL has submitted the LPM before its COD.

(vii). The Authority considers that ramp rate is design parameter and fixed at the design stage. In this regard, the Authority observes that the proposed changes in ramping rate and grid synchronization times are according to the design parameters. Further. HRSPEPL has provided certificates/documents from the equipment manufacturers declaring the proposed amendments technically feasible and necessary for smooth and long term operation of the units.

(viii). The Authority considers that in order to comply with the revised calorific value (i.e. 5500 kcal/kg), power plant current design needs to be changed which is not feasible for HSRPEPL due to early procurement of all major equipment of the project. Further, the PPA envisages that HSRPEPL will provide the data as per manufacturer/EPC loading curves for the complex. In this regard, the Authority observes that the proposed changes in the ramping rate and grid synchronization time are as per manufacturer/EPC loading curves.

(ix). In consideration of the above, the Authority is of the considered opinion that the proposed LPM will not have any adverse effect on the performance of the licensee of its obligations. The LPM will not cause the Authority to act or acquiesce in any act or omission of the licensee in a manner contrary to the provisions of the NEPRA Act or the rules or regulations made pursuant to the NEPRA Act. The LPM is reasonably necessary for the licensee to effectively and efficiently perform its obligations under the licence. Further, the LPM is necessary to reduce the supply-demand gap in the country, keeping in view the financial and technical viability of the Licensee.

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National Electric Power Regulatory Authority (NEPRA)

Islamabad – Pakistan

GENERATION LICENCE

No. IGSPL/60/2015

In exercise of the Powers conferred under Section-26 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, the Authority hereby modifies the Generation Licence (No. IGSPL/60/2015 dated June 10, 2015) granted to Huaneng Shandong Ruyi (Pakistan) Energy (Pvt.) Limited, to the extent of changes mentioned hereunder:

(a). Changes made in **Schedule-I** of the generation licence regarding ramping rate and time required to synchronize to grid attached as **Annexure-A**.

This **Modification-I** is given under my hand on this 27th **day** of **October Two Thousand & Seventeen**

27 x 17

Registrar

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Modification-I
in the Generation Licence (No. IFSPL/60/2015, dated June 10, 2015) of Huaneng Shandong Ruyi (Pakistan) Energy (Private) Limited

(A). Details of Generation Facility/Power Plant:

1. At F(v) of schedule-I the detail relating to ramping rate of the generation facility/power plant has been revised/modified as:

Unit load range % age	Cold Start (%MW/Min)	Warm Start (%MW/Min)	Hot Start (%MW/Min)
0—<25%	0.2	0.6	1
25— 50%	0.3	0.8	1
50— 100%	0.3	0.3	0.8

2. At F(vi) of schedule-I the detail relating to time required to synchronize to Grid has been revised/modified as:

Time required to synchronize to Grid (Hrs.)	Cold start	Warm start	Hot start	Very hot start
	10 Hrs.	8 Hrs.	2.5 Hrs.	1.5 Hrs.

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