

**TN Reference: TN-NEPRA-SM-01**

June 13, 2023.

**The Registrar**

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

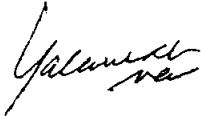
**Subject: Application under Regulation 9(1) of NEPRA (Application & Modification Procedure) Regulations, 2021, on behalf of ThalNova Power Thar (Pvt.) Limited for Modification of its Generation License**

Dear Sir,

I, Saleemullah Memon, being the duly authorized representative of ThalNova Power Thar (Pvt.) Limited by virtue of Board Resolution dated January 12, 2023, hereby apply to the National Electric Power Regulatory Authority for the modification of our Generation Licence No. IGSP/75/2017 dated February 01, 2017 (the "Application").

Pay order# **04867839** dated 8 June 2023 from Standard Chartered, Karachi Branch in the sum of Rupees Two Million, Three Hundred Fifty-Four Thousand, Three Hundred Ten Only (Rs. 2,354,310/-), being the non-refundable license application fee calculated in accordance with Schedule II to the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 2021, is also attached herewith.

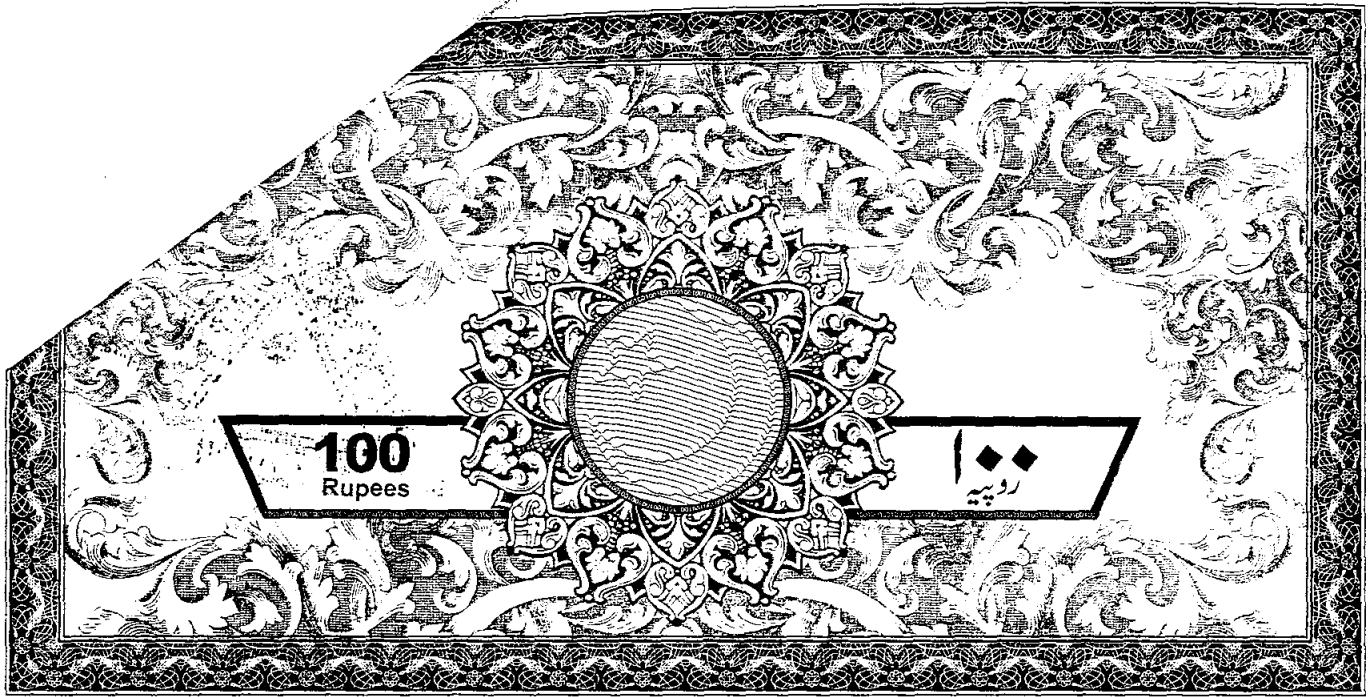
Best Regards,



**Saleemullah Memon**  
Chief Executive Officer

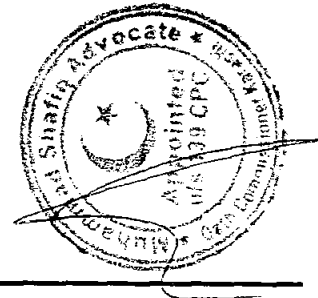
**Enclosed:**

- 1 - Pay order# **04867839** dated 8 June 2023 from Standard Chartered, Karachi Branch
- 2 - Affidavit
- 3 - Extract of Board Resolution
- 4 - Licence Proposed Modification (LPM) Application
- 5 - Copy of Generation Licence No. IGSP/75/2017 dated February 01, 2017



03 APR 2023

RUPEES ONE HUNDRED ON



### AFFIDAVIT

I, Saleemullah Memon, holding CNIC No. 43304-0595666-7, Chief Executive Officer of **ThalNova Power Thar (Private) Limited**, having its registered office located at 9th Floor, Ocean Tower, Block-9, Main Clifton Road Karachi, 75600, 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. IGSP/75/2017 for 330.00 MW indigenous coal based thermal generation facility located at 5.0 KM from Thar Block-II of Thar Coalfields, District Tharparkar, 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.

**ATTESTED**  
**KUNAMU KHAN**  
**ADVOCATE**  
**7th Floor, Ocean Tower**

*Saleemullah Memon*

DEPONENT



**ThalNova**  
Power Generation

**CERTIFIED TRUE COPY OF THE RESOLUTIONS OF THE BOARD OF DIRECTORS OF THALNOVA POWER THAR (PRIVATE) LIMITED (THE "COMPANY") DATED JANUARY 12, 2023, PASSED BY CIRCULATION**

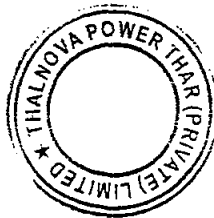
**"UNANIMOUSLY RESOLVED** that the Application for Modification of Generation License No. IGSPL/75/2017 for 330.00 MW indigenous coal based thermal generation facility located at 5.0 KM from Thar Block-II of Thar Coalfields, District Tharparkar, Sindh (the "Application"), is hereby approved for submission by the Company to the National Electric Power Regulatory Authority ("NEPRA")."

**"FURTHER RESOLVED THAT** the Chief Executive Officer, Chief Financial Officer, the Company Secretary or any authorized representative/nominated officer of the Company be and is hereby singly given the mandate and authorized to:

- i. 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;
- ii. 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
- iii. 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."

**"FURTHER RESOLVED THAT** any and all actions of the authorized representative/nominated officer in pursuant to, or in furtherance of the intent and purposes of the foregoing resolution, are hereby in all respects adopted, approved, confirmed and ratified as the valid and subsisting acts of this Company."

Zamzam Sohail Kassamali  
Company Secretary



**ThalNova Power Thar (Private) Limited**

09th Floor, Ocean Tower Block -9, Main Clifton Road Karachi, Pakistan  
Ph: 0213-3587 4677-86, 0213-3583 9018

## 1 DETAILS OF THE PETITIONER

### 1.1 Name and Address

Name:	ThalNova Power Thar (Pvt) Limited (TNPTL)
Address:	09th Floor, Ocean Tower Block-9, Main Clifton Road Karachi, 75600, Pakistan
Phone:	+92 21 3587 4677-86 +92 21 3583 9018
Fax:	+92 21 3587 0397

### 1.2 Particulars of Authorized Representative

Name:	Mr. Saleemullah Memon
Designation:	Chief Executive Officer

### 1.3 Particulars of Authorized Representative

ThalNova Power Thar (Pvt.) Limited (the “Company”) is private limited Company incorporated under the laws of Pakistan and has established a 330MW indigenous Thar coal based thermal generation facility located at Thar Coal Block-II, Village Singharo-Bitra in Taluka Islamkot, District Tharparkar, in the province of Sindh.

NEPRA granted the Company Generation License NO. IGSPL/75/2017 Dated February 01, 2017 (the “Generation License”) under section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act ,1997.

## 2 PROPOSED MODIFICATION

Pursuant to Regulation 10(1) of the 2021 Regulations, Company hereby applies for the following modifications to the specification 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 the schedule 1 of the Generation License (under the heading “Detail of Generation Facility / Power Plant are proposed to be written as follows:

Complex Net load range % age	Cold Start (% / Min)	Warm Start (%/Min)	Hot Start (% /Min)
<u>0 – 25 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
Hold Time	10 minutes		
<u>25 – 50 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
Hold Time	10 minutes		
<u>50 – 75 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>

Hold Time	10 minutes		
<u>75 – 90 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
Hold Time	10 minutes		
<u>90 – 100 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
<u>Total Time</u>	<u>326 minutes</u>	<u>189 minutes</u>	<u>140 minutes</u>

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

<b>Length of Shutdown</b>	<b>Notice Required to Synchronize (The time start after boiler ignited)</b>
Not more than 2 hours	<u>100 min</u>
More than 2 hours but less than 8 hours	<u>150 min</u>
More than 8 hours but less than 32 hours	<u>360 min</u>
More than 32 hours but less than 150 hours	<u>550 min</u>
More than 150 hours	<u>770 min</u>

2.3 The Gross storage of startup fuel set out in row(viii) of table C of schedule 1 of Generation license under the heading "Detail of Generation Facility / Power Plant is proposed to 600m<sup>3</sup>.

2.4 The Power Factor of Plant set out in row(iii) of table F of schedule 1 of Generation license under the heading "Detail of Generation Facility / Power Plant is proposed to be 0.8 lagging / 0.9 leading.

### 3 STATEMENT OF THE REASON IN SUPPORT OF THE MODIFICATION

The above modifications to Ramping rates, time periods for Synchronization to the Grid and gross storage of Start-up Fuel are necessary because these specifications were provided by the Company to NEPRA at the time of filling 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 requirement of the power plant and the data and instructions provided by the manufacturer to the Company.

Consistent with NEPRA determination in the matter of similar IPPs modification application and Article 3.2 of Generation License, The Company hereby requesting modification of its Generation License in light of actual design of the power plant and the data provided and instruction 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 the modification to Ramping Rates

Modification to the Ramping rates is necessary because:

- a. ThalNova power plant is equipped with a Circulating Fluidized Bed (CFB) boiler and Thar lignite coal combusted. For CFB boiler, the normal ramp rate is no more than 1%Pe/min for Hot startup, 0.67% Pe/min and 0.35% Pe/min for Warm and Cold startup respectively.
- b. High moisture lignite coal is combusted, and some residence time required to ensure proper burning. If the Ramping rate along with Hold Times are not followed, the circulation and heating of the furnace cannot be ensured, faster ramp rate may cause excess coal feed to furnace in low temperature condition, which may result in localized explosion, ash fusion and clinker formation in Boiler. Therefore, the modification to the Ramp rate, set out in paragraph 2.1 above, has been proposed to ensure safe and efficient operation of the power plant.
- c. Meanwhile, the ramp rate is crucial to ensure proper heating of the Boiler, Steam Turbine, and Steam pipelines to avoid exceed thermal stress. If the Ramping rate is not limited, it may cause an adverse change in the airflow, distribution of coal, and difficulty in achieving thermal & chemical equilibrium for the CFB boiler, which may impact the system parameters like steam pressure, steam temperature etc. adversely. Under these circumstances, the boiler may overheat or leak. Furthermore, heat stress protection on the cylinder metal will be triggered and load ramping will be limited by GE TCS system, or even the operational life span of turbine may be affected.
- d. According to Chinese relevant standards, the Ramp rate of CFB unit should be limited no more than 1%Pe/min, to ensure main system parameters are properly under controlled, such as boiler bed temperature, primary air pressure, second air flow, drum level, main steam pressure, main/reheat steam temperature, etc. Ramp rate of ThalNova Power Plant shall be limited within 1%Pe/min for Hot startup, 0.67% Pe/min and 0.35% Pe/min for Warm and Cold startup respectively.

Annexure 1: Start-up Load Profiles

### 3.2 Rationale for the modification to the Time required for the Synchronization to the Grid

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

**More than 150 hours: Total 770 Minutes**, wherein, 200 minutes are required auxiliary boiler start and auxiliary steam system warm up, as well as for boiler water purity & pressure raising; 500 minutes are required for CFB boiler to setup temperature and pressure after the successful ignition; hot flushing time of 30 minutes in addition to Boiler Startup time to achieve the steam purity is required; Then, 40 minutes are required for turbine rolling and synchronization to grid. Therefore total 770 minutes are required for unit startup.

**More than 32 hours and less than 150 hours: Total 550 Minutes** wherein, 200 minutes are required auxiliary boiler start and auxiliary steam system warm up, as well as for boiler water purity & pressure raising; 290 minutes are required for CFB boiler to setup temperature and pressure after the successful ignition; hot flushing time of 30 minutes is needed; Then, 30 minutes are required for turbine rolling and synchronization to grid. Therefore total 550 minutes are required for unit startup.

**More than 8 hours and less than 32 hours: Total 360 Minutes** wherein 200 minutes are required for auxiliary boiler start and auxiliary steam system warm up, as well as for boiler water purity & pressure raising; 145 minutes are required for CFB boiler to set up temperature and pressure after the successful ignition; Then, 15 minutes are required for turbine rolling and synchronization to grid. Therefore total 360 minutes are required for unit startup.

**More than 2 hours less than 8 hours: Total 150 minutes**, wherein 135 minutes are required for CFB boiler to set up temperature and pressure after the successful ignition; then, 15 minutes are required for turbine rolling and synchronization to grid. Therefore, total 150 minutes are required for unit start-up.

**Not more than 2 hours: Total 100 minutes**, wherein 85 minutes are required for CFB boiler to set up temperature and pressure after the successful ignition; Then, 15 minutes are required for turbine rolling and synchronize to grid. Therefore, total 100 minutes are required for unit start-up.

Annexure 2: Startup curves

### 3.3 Rationale for the modification in Startup Fuel storage

As per engineering design of the project the capacity of startup fuel should be 600m<sup>3</sup> (2x300 m<sup>3</sup>).

### 3.4 Rationale for the modification in Power Factor

As per OEM data the power factor should be 0.8 Lagging and 0.9 Leading.

Annexure 3: OEM Datasheet

## 4 STATEMENT OF THE 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 1 x 330 MW Coal Power 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 perform its obligations effectively and efficiently under the Generation License.
- 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.



## 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'330 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
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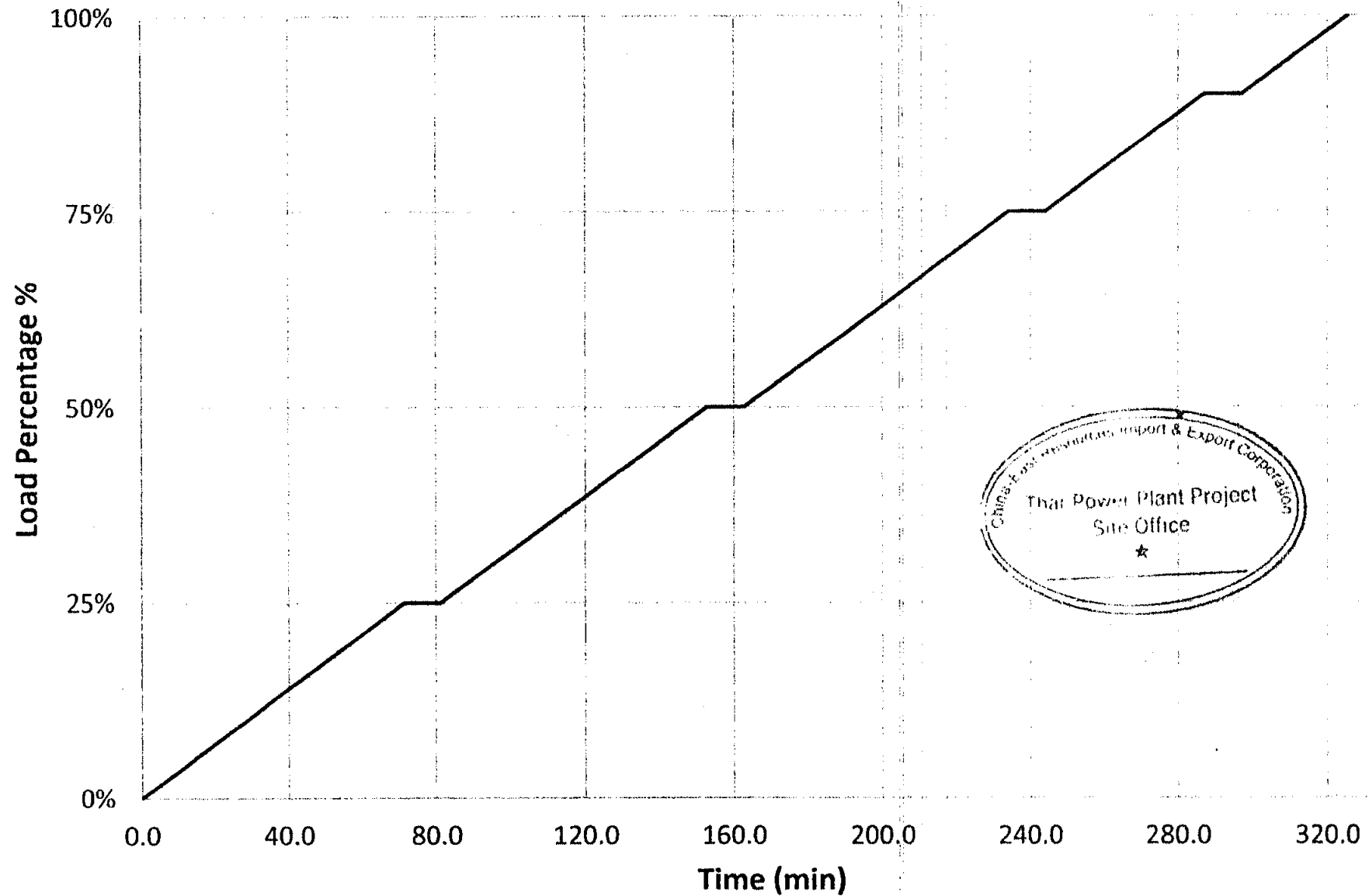
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## **Annexure 1**

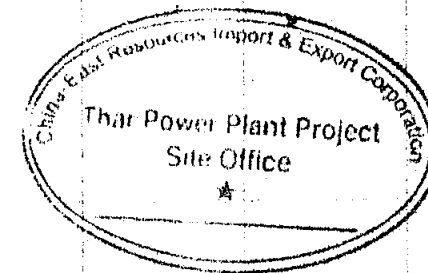
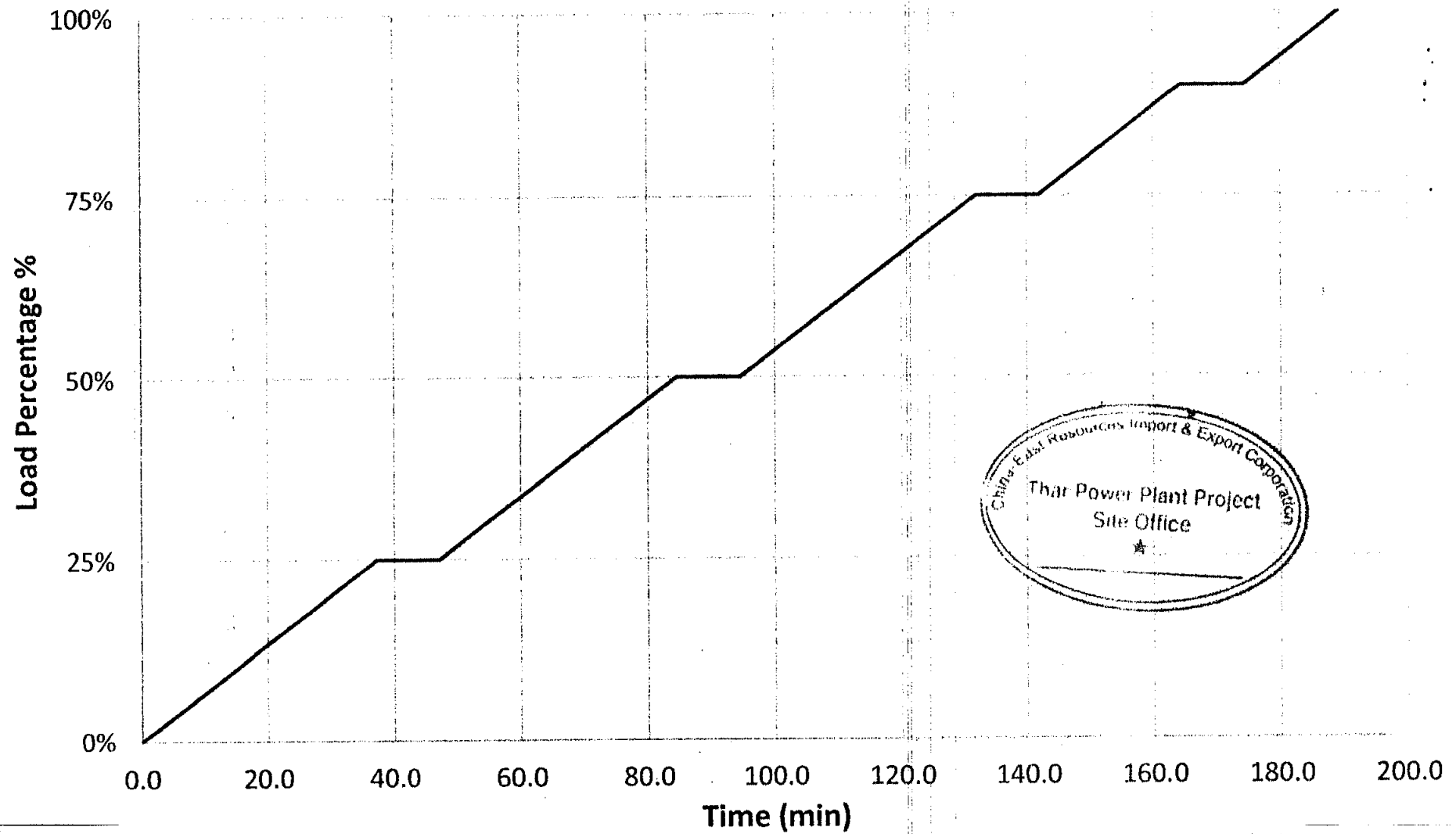
### **Start-up Load Profiles**

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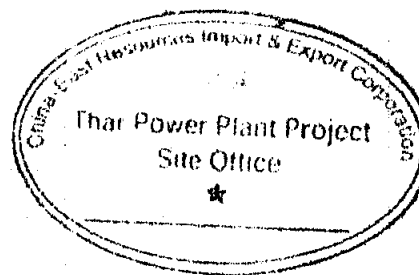
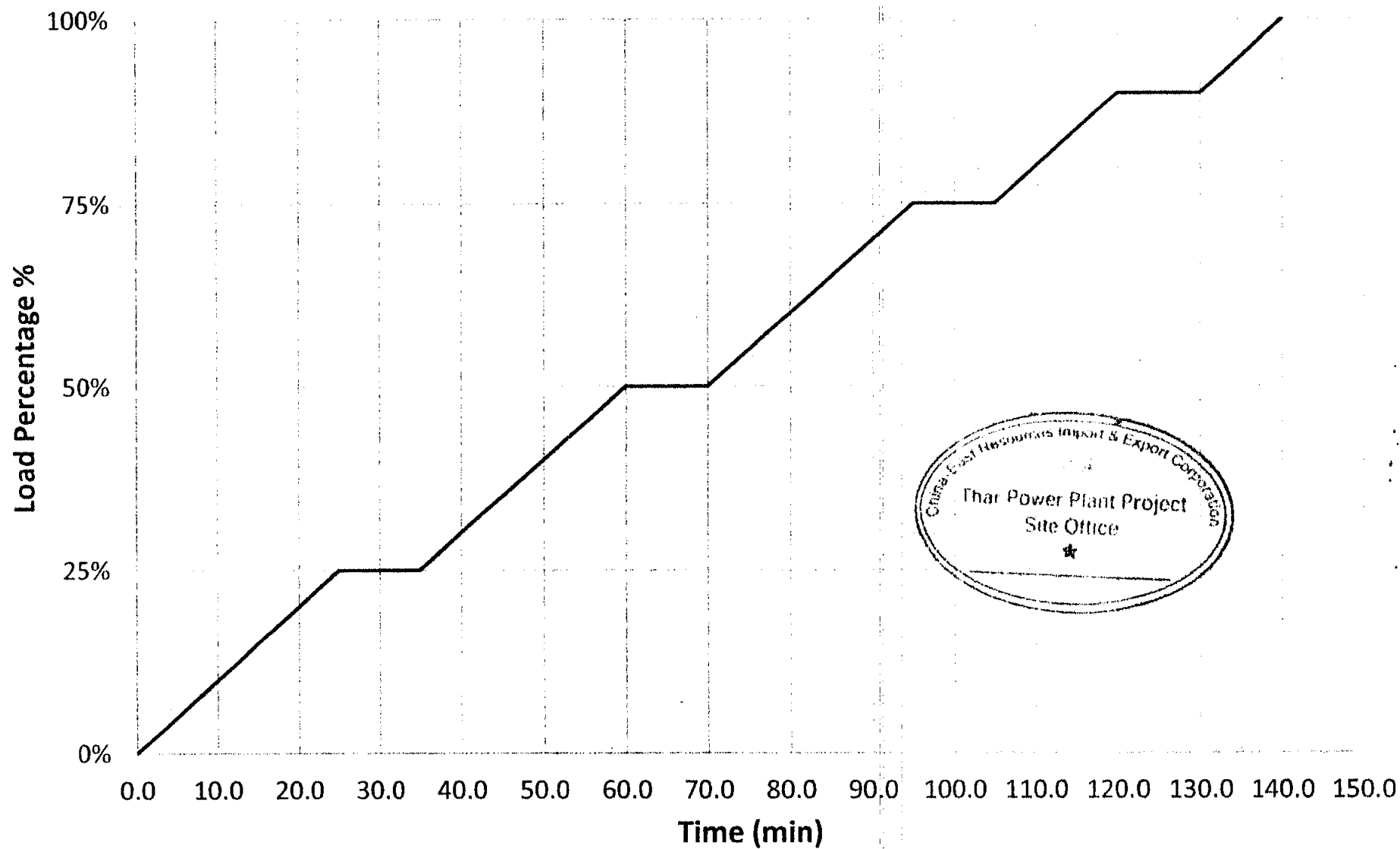
Cold Start-up Load Profile (Synch to Full Load = 326 min)



Warm Start-up Load Profile (Synch to Full Load = 189 min )



Hot Start-up Load Profile (Synch to Full Load = 140 min)



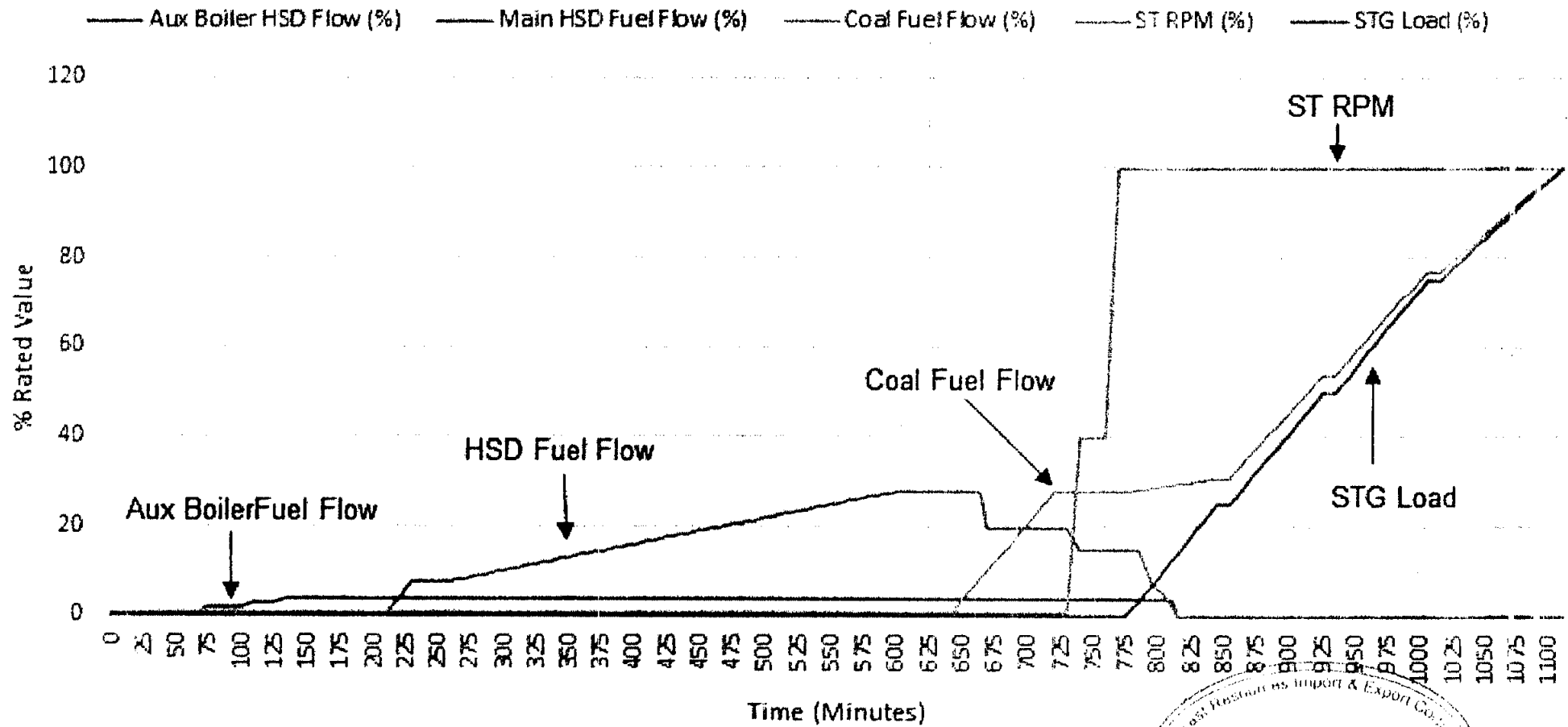
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## Annexure 2

### Start-up Curves

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## TNPTL 1\*330MW CFPP - Cold Startup Curve after 150 Hours (100% MCR, Performance Coal)

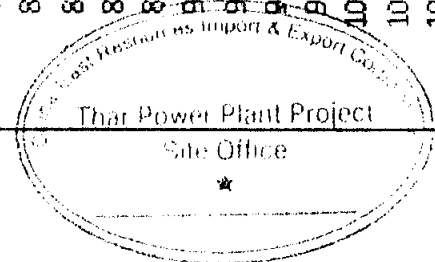


**Note:**

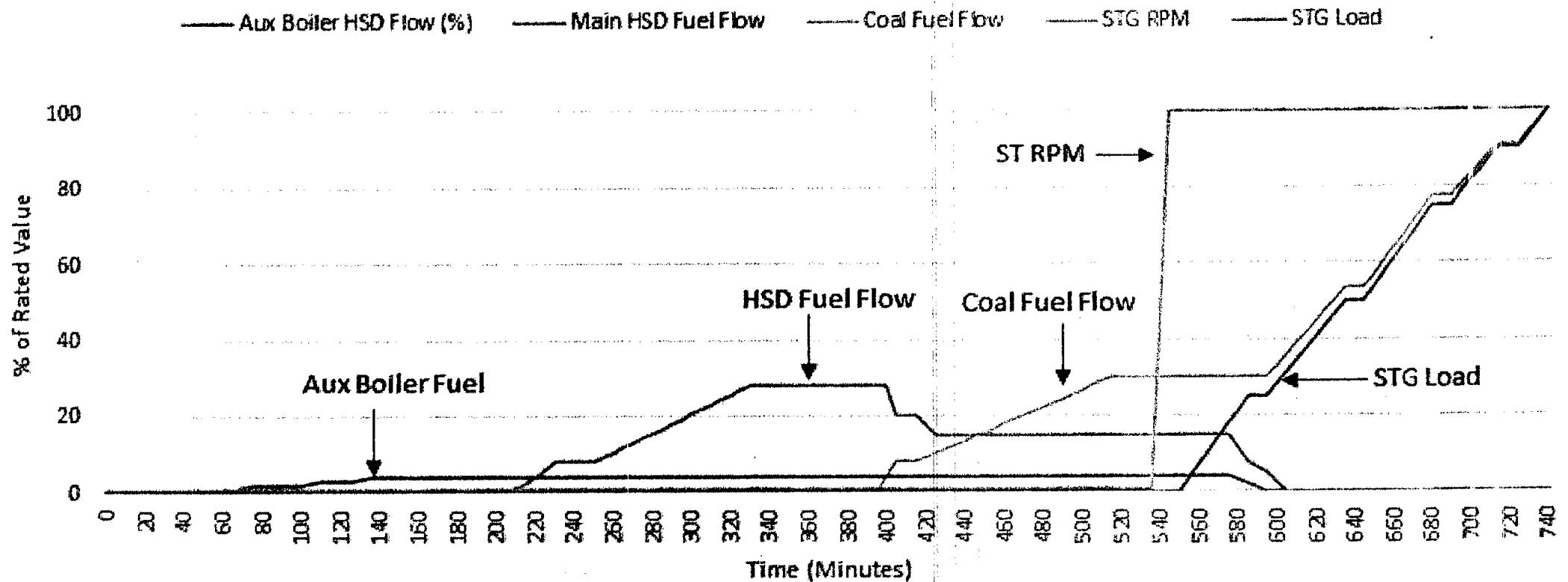
All OEM requirements will be followed.

This graph is only used to inform NTDC the time of unit startup.

The bed inventory should be 10 ~ 12 KPa equivalent before startup.

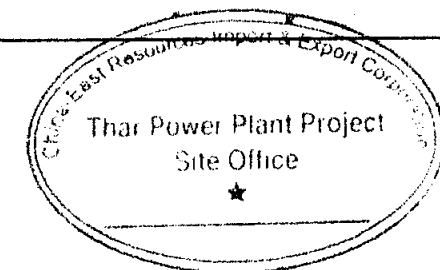


## TNPTL 1\*330MW CFPP Warm-2 Startup Curve after 32 hrs & less than 150hrs (100% MCR, Performance Coal)



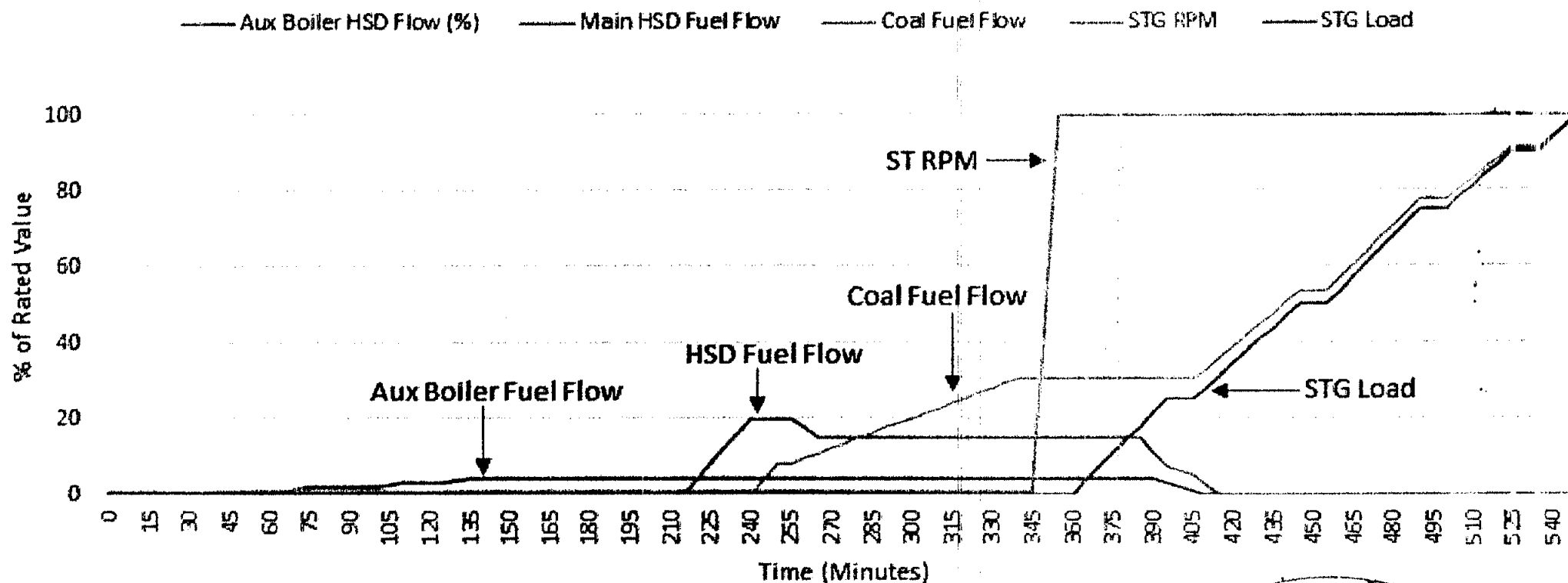
**Note:**

All OEM requirements will be followed.  
This graph is only used to inform NTDC the time of unit startup.  
The bed inventory should be 10 ~ 12 KPa equivalent before startup.





## TNPTL 1\*330MW CFPP Warm-1 Startup Curve after 8 hrs & less than 32 hrs (100% MCR, Performance Coal)

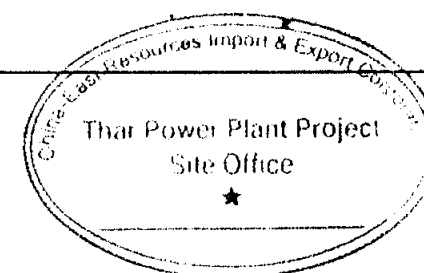


**Note:**

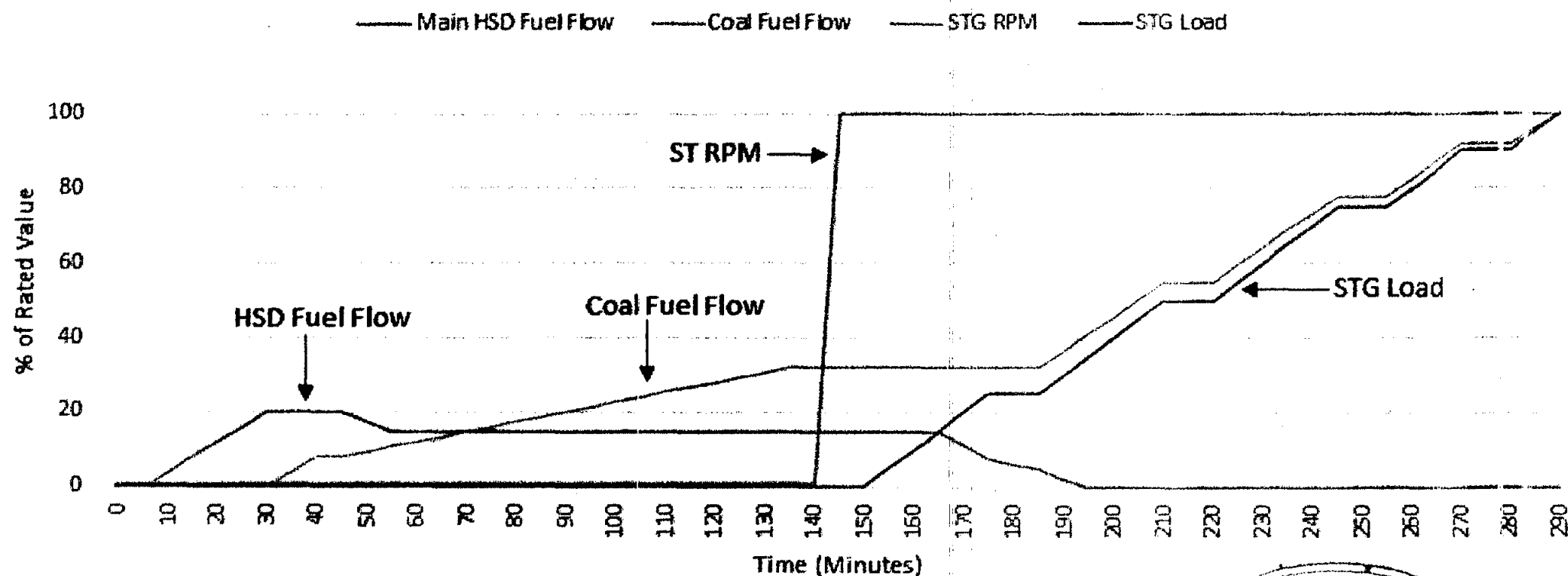
All OEM requirements will be followed.

This graph is only used to Inform NTDC the time of unit startup.

The bed inventory should be 10 ~ 12 KPa equivalent before startup.



# TNPTL 1\*330MW CFPP Hot Startup Curve after 2 hrs & less than 8 hrs (100% MCR, Performance Coal)

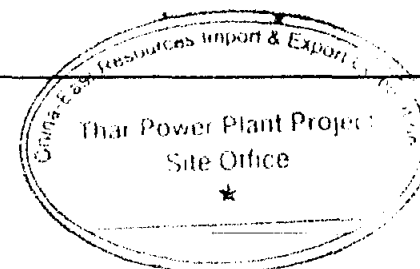


## Note:

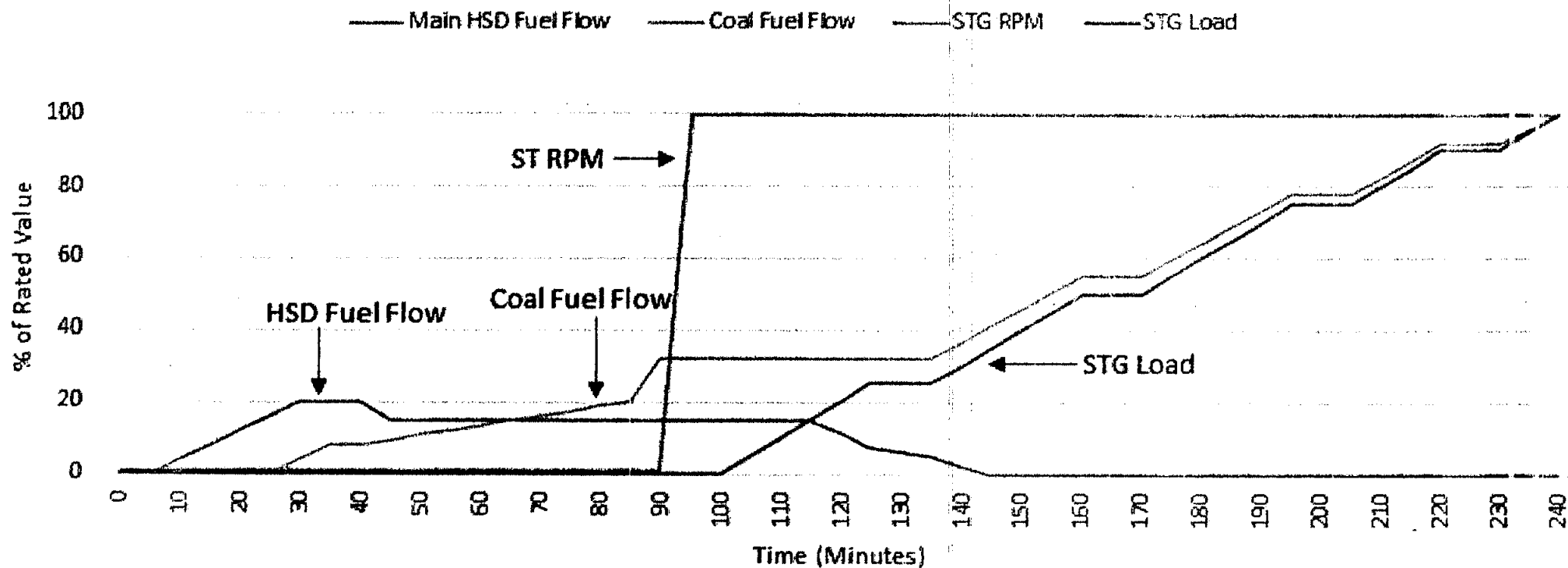
All OEM requirements will be followed.

This graph is only used to inform NTDC the time of unit startup.

The bed inventory should be 10 ~ 12 KPa equivalent before startup.



# TNPTL 1\*330MW CFPP Very Hot Startup Curve less than 2 hrs (100% MCR, Performance Coal)

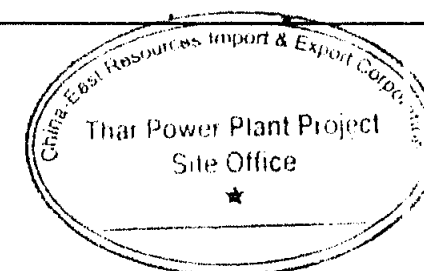


**Note:**

All OEM requirements will be followed.

This graph is only used to inform NTDC the time of unit startup.

The bed inventory should be 10 ~ 12 KPa equivalent before startup.





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## **Annexure 3**

### **OEM Datasheet**

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MB	22-01-2023	As Built	SHEN HONGTAO	SUN LEI	ZHENG EDMOND
Rev.	Date	Description	Designer	Checker	Approver
Project Name:					
巴基斯坦塔尔煤田 II 区块 ThalNova 电站项目 TNPTL 1x330MW Power Plant					
Owner:					
 <b>ThalNova Power Thar (Private) Limited</b>					
EPC Contractor:					
 <b>中国机械设备工程股份有限公司</b> <b>China Machinery Engineering Corporation</b>					
EPC Designer:					
 <b>中国电力工程顾问集团中南电力设计院有限公司</b> <b>CENTRAL SOUTHERN CHINA ELECTRIC POWER DESIGN INSTITUTE CO., LTD. OF CHINA POWER ENGINEERING CONSULTING GROUP</b>					
DETAILED DESIGN STAGE I (A)					

Scale 1:1			Other Document Code (if any):	
Responsible dept. 6515	Created by SHEN HONGTAO	Checked by SUN LEI	Approved by ZHENG EDMOND	Format A4
Originator	Document Type DA		Project Document Code THN/10/S/MK-----4580/DS/001	
GE Power	Document title, Subtitle <b>Technical Data Sheet</b> 50WT21H-120 with static excitation		Document Status <b>Released</b>	
		Identification number <b>1BCE410511</b>		
		Rev. MB	Date 22/01/2023	Lang. EN

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# TOPGAS

Technical Data for Generator **50WT21H-120** with Static Excitation  
455.6 MVA 21000 V 50 Hz p.f. = 0.80 T<sub>cg</sub> = 50 °C Temp.-Cl. = 130(B)

2023-01-23:03

Content:	Page
1. Generator main data (rating).....	3
2. Generator reactances and resistances .....	4
3. Time constants (unsaturated).....	5
4. Miscellaneous (electrical and noise).....	5
5. Torque and inertia .....	6
6. Critical speeds generator only.....	6
7. Generator losses at rated load .....	6
8. Generator efficiency .....	7
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10. Generator rotor .....	8
11. Generator hydrogen cooler data (without glycol) .....	8
12. Brushgear cooler data.....	9
13. Generator bearings.....	9
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Legal Owner <b>GE Power</b>	Identification number <b>1BCE410511</b>	Rev. <b>MB</b>	Date <b>22/01/2023</b>	Lang. <b>EN</b>	Sheet <b>2/9</b>
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1.	Generator main data (rating)	Sym.	Value	Di m.
1.1	Standards		IEC 60034	
1.2	Temperature rise according to class		130(B)	
1.3	Rated apparent power	$S_n$	455.6	MV A
1.4	Rated active power	$P_n$	364.5	MW
1.5	Rated terminal voltage (+ 5.0 % / - 5.0 %)	$U_n$	21000	V
1.6	Rated phase current	$I_n$	12526	A
1.7	Rated power factor Power factor: 0.80 lagging / 0.90 leading	$\cos\varphi_n$	0.80	-
1.8	Rated frequency (+ 2.0 % / - 3.0 %)	$f_n$	50	Hz
1.9	Rated speed	$n_n$	3000	rpm
1.10	Cold gas inlet temperature	$T_{cg}$	50	°C
1.11	Hydrogen pressure (gauge)	$P_{H_2}$	4.5	bar
1.12	Hydrogen purity		98.0	%
1.13	Generator field current at no load, rated terminal voltage	$I_{f0}$	1627	A
1.14	Generator field voltage at no load, rated terminal voltage and 95.0 °C	$U_{f0}$	137	V
1.15	Generator field current at rated conditions	$I_{fn}$	4249	A
1.16	Generator field voltage at rated conditions and 110.0 °C	$U_{fn}$	364	V
1.17	Ceiling current		2.0×4249	A
1.18	Ceiling voltage		2.25×364	V
1.19	Ceiling time		10.0	s
1.20	Short-circuit ratio	SCR	0.592	-
1.21	Generator output with one cooler out of service		67.0	%

Legal Owner <b>GE Power</b>	Identification number <b>1BCE410511</b>	Rev. <b>MB</b>	Date <b>22/01/2023</b>	Lang. <b>EN</b>	Sheet <b>3/9</b>
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2.	Generator reactances and resistances	Sym.	Value	Dim.
2.1	Rated impedance	$Z_n$	0.968	$\Omega$
2.2	Direct-axis synchronous reactance (unsaturated)	$x_d$	1.77	p. u.
2.3	Direct-axis transient reactance (unsaturated)	$x'_d$	0.301	p. u.
2.4	Direct-axis subtransient reactance (unsaturated)	$x''_d$	0.232	p. u.
2.5	Direct-axis transient reactance (saturated)	$x'_{dv}$	0.295	p. u.
2.6	Direct-axis subtransient reactance (saturated)	$x''_{dv}$	0.186	p. u.
2.7	Quadrature-axis synchronous reactance (unsaturated)	$x_q$	1.708	p. u.
2.8	Quadrature-axis transient reactance (unsaturated)	$x'_q$	0.499	p. u.
2.9	Quadrature-axis subtransient reactance (unsaturated)	$x''_q$	0.250	p. u.
2.10	Negative-sequence reactance (unsaturated)	$x_2$	0.235	p. u.
2.11	Zero-sequence reactance (unsaturated)	$x_0$	0.099	p. u.
2.12	Negative-sequence reactance (saturated)	$x_{2v}$	0.189	p. u.
2.13	Zero-sequence reactance (saturated)	$x_{0v}$	0.079	p. u.
2.14	Potier reactance	$x_p$	0.320	p. u.
2.15	Leakage reactance (stator)	$x_\sigma$	0.201	p. u.
2.16	Positive-sequence resistance	$r_1$	0.0022	p. u.
2.17	Negative-sequence resistance at 95.0 °C	$r_2$	0.0222	p. u.
2.18	Zero-sequence resistance at 95.0 °C	$r_0$	0.00089	p. u.
2.19	Stator resistance per phase at 95.0 °C	$R_a$	0.858	m $\Omega$
2.20	Rotor resistance at 95.0 °C	$R_f$	0.0808	$\Omega$
2.21	Stator impedance without rotor	$X_{total}$	0.52	$\Omega$

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3.	Time constants (unsaturated)	Sym.	Value	Dim.
3.1	Direct-axis transient open-circuit time constant at 95.0 °C	$T'_{do}$	5.58	s
3.2	Direct-axis transient short-circuit time constant at 95.0 °C	$T'_d$	0.95	s
3.3	Direct-axis subtransient open-circuit time constant at 95.0 °C	$T''_{do}$	0.020	s
3.4	Direct-axis subtransient short-circuit time constant at 95.0 °C	$T''_d$	0.016	s
3.5	Quadrature-axis transient open-circuit time constant at 95.0 °C	$T'_{qo}$	0.54	s
3.6	Quadrature-axis transient short-circuit time constant at 95.0 °C	$T'_q$	0.16	s
3.7	Quadrature-axis subtrans. open-circuit time constant at 95.0 °C	$T''_{qo}$	0.032	s
3.8	Quadrature-axis subtrans. short-circuit time constant at 95.0 °C	$T''_q$	0.016	s
3.9	Short-circuit time constant of armature winding at 95.0 °C	$T_a$	0.84	s
4.	Miscellaneous (electrical and noise)	Sym.	Value	Dim.
4.1	Three-phase stator winding capacitance (3 x $C_{Phase}$ to ground)	C	2.057	$\mu F$
4.2	Telephone Influence Factor, balanced	TIF	$\leq 40.0$	p. u.
4.3	Telephone Influence Factor, residual	TIF	$\leq 30.0$	p. u.
4.4	Telephone Harmonic Factor	THF	$\leq 0.015$	p. u.
4.5	Total Harmonic Distortion	THD	$\leq 0.05$	p. u.
4.6	Continuous unbalanced load, maximum	$I_{2\infty}$	0.076	p. u.
4.7	Short time capability for unbal. faults, max.	$I_2^{2,t}$	7.4	p.u.s
4.8	Saturation factor $I_{f0} / I_{fair-gap}$ (acc. to IEEE 100)		1.05	p. u.
4.9	Voltage increase at sudden load rejection and rated $\cos\phi = 0.80$ (without AVR action)		41.2	%
4.10	Voltage increase at sudden load rejection and $\cos\phi = 1.00$ (without AVR action)		28.5	%
4.11	3-phase short-circuit current (peak value)	$i_{p3}$	171	kA
4.12	3-phase steady-state short-circuit current (r.m.s.)	$I_{k3}$	19349	A
4.13	A-weighted sound power level (acc. to ISO 3746) (reference: 1 pW)	$L_{WA}$	116	dB(A)
4.14	A-weighted surface sound pressure level (acc. to ISO 3746) (reference: $2 \cdot 10^{-5}$ Pa)	$L_{pA}$	85	dB(A)

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5. Torque and inertia		Sym.	Value	Dim.
5.1	Nominal torque	$M_N$	1160	kNm
5.2	Synchronous pull-out torque	$M_{max}$	2235	kNm
5.3	Maximum two-phase short-circuit torque	$M_{k2}$	10138	kNm
5.4	Inertia moment (generator + exciter/slipring shaft only)	J	8067	kgm <sup>2</sup>
5.5	Inertia constant (generator + exciter/slipring shaft only)	H	0.874	s
6. Critical speeds generator only		Sym.	Value	Dim.
6.1	1st. critical speed (for information only)		695	rpm
6.2	2nd. critical speed (for information only)		1970	rpm
6.3	3rd. critical speed (for information only)		4384	rpm
6.4	Calculated with flexibility of bearing support	$\alpha$	1.00	mm/MN
6.5	Revolutions per minute at overspeed test ( 2 min.)		3600	rpm
7. Generator losses at rated load		Sym.	Value	Dim.
7.1	Core losses	$P_{Fe}$	511	kW
7.2	Stator copper at 95.0 °C	$P_{Cu1}$	404	kW
7.3	Stray load losses	$P_{sup}$	600	kW
7.4	Rotor copper at 95.0 °C	$P_{Cu2}$	1480	kW
7.5	Excitation losses	$P_{exc}$	55	kW
7.6	Windage losses	$P_{Ven}$	593	kW
7.7	Bearing losses	$P_{Lag}$	413	kW
7.8	Total	$P_{tot}$	4056	kW

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8.	Generator efficiency		Sym.	Value	Dim.
8.1	At rated $\cos\phi = 0.80$	- full load	$\eta$ 4/4	98.89	%
		- 3/4 load	$\eta$ 3/4	98.87	%
		- 2/4 load	$\eta$ 2/4	98.68	%
		- 1/4 load	$\eta$ 1/4	97.86	%
8.2	At $\cos\phi = 1.00$	- full load	$\eta$ 4/4	99.23	%
		- 3/4 load	$\eta$ 3/4	99.14	%
		- 2/4 load	$\eta$ 2/4	98.90	%
		- 1/4 load	$\eta$ 1/4	98.03	%

9.	Generator stator		Value	Dim.
9.1	Core length		6000	mm
9.2	Inside diameter of core		1306	mm
9.3	Number of slots		54	
9.4	Type of slots		rectangular	
9.5	Number of parallel paths in winding		2	
9.6	Type of winding		2-lay. Roebelbar	
9.7	Type of end winding joint		brazed	
9.8	Lamination thickness		0.50	mm
9.9	Lamination losses at 1.5 T		2.90	W/kg
9.10	Lamination insulation		varnish	
9.11	Class of insulation		155(F)	
9.12	Material between turns		hard glass fibre	
9.13	Stator core pressplate material		aluminum alloy	
9.14	Main insulation system		Micadur	
9.15	Method of cooling stator winding		indirectly	
9.16	Winding coolant		H2	
9.17	Core coolant		H2	

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10.	Generator rotor	Value	Dim.
10.1	Diameter of body	1080	mm
10.2	Number of wound slots per half pole	7	
10.3	Conductor material	hard copper	
10.4	Class of winding insulation	155(F)	
10.5	Material between turns in slot	laminated glass	
10.6	Material in slot between conductor and iron	Nomex	
10.7	Material under retaining rings	Nomex / Kapton	
10.8	Material of damper winding	copper alloy	
10.9	Material of rotor forging	ferritic steel	
10.10	Material of retaining rings	X8CrMnN1818	
10.11	Method of axial securing of end ring	bayonet fitting	
10.12	Method of balancing	multiplane dyn.	
10.13	Number of fans	2	
10.14	Method of cooling rotor winding	directly	
10.15	Winding coolant	H2	
10.16	Max. permissible ceiling voltage (DC)	1500	V

11.	Generator hydrogen cooler data (without glycol)	Sym.	Value	Dim.
11.1	Design capacity	Pdiss	3700	kW
11.2	Total gas flow (at Tcg = 50 °C)		40.91	m³/s
11.3	Number of coolers		4	
11.4	Capacity of one cooler		25	%
11.5	Cooling water flow		450.0	m³/h
11.6	Cooling water inlet temperature		42.0	°C
11.7	Cooling water pressure drop		≤ 500	mbar
11.8	Cooling water pH value		6.5 – 9.5	
11.9	Tube material		CuNi10Fe	

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12.	Brushgear cooler data	Value	Dim.
12.1	Type of brush gear	TEG61L0	
12.2	Design capacity	64	kW
12.3	Number of coolers	4	
12.4	Capacity of one cooler	25	%
12.5	Cooling water flow	14	m <sup>3</sup> /h
12.6	Cooling water pressure drop	≤ 500	mbar

13.	Generator bearings	Value	Dim.
13.1	Type	journal bearing (pocket type)	
13.2	Nominal diameter	DE, drive end	500 mm
13.3	Nominal diameter	NDE, non drive end	400 mm
13.4	Nominal diameter	EE, excitation end	250 mm

14.	Synchronising requirements	Sym.	Value	Dim.
14.1	Max. fault angle between generator and system (grid)	$\Delta\alpha$	±15	deg.
14.2	Max. frequency deviation (slip) between generator and system (grid)	s	±0.5	%
14.3	Max. voltage deviation between generator and system (grid)	$\Delta U$	±5.0	%

## 15. Generator diagrams

Refer to document 1BCE410512.

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**National Electric Power Regulatory Authority**  
**Islamic Republic of Pakistan**

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad  
Ph: +92-51-9206500, Fax: +92-51-2600023  
Web: www.nepa.org.pk, E-mail: registrar@nepa.org.pk

**Registrar**

No. NEPRA/R/DL/LAG-361/1687-94

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.

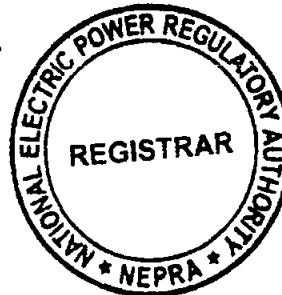
**Subject: Generation Licence No. IGSP/L/75/2017**  
**Licence Application No. LAG-361**  
**ThalNova Power Thar (Pvt.) Limited (TNPTPL)**

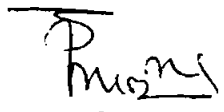
**Reference:** Your application vide letter No. TN/01/0012/08-2016, dated August 10, 2016,  
received on August 11, 2016.

Enclosed please find herewith Generation Licence No. IGSP/L/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 (IGSP/L/75/2017)**



  
01.02.17  
(Syed Safer Hussain)

**Copy to:**

1. Secretary, Ministry of Water and Power, A-Block, Pak Secretariat, Islamabad.
2. The Secretary, Energy Department, Government of Sindh, 3<sup>rd</sup> 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.

**National Electric Power Regulatory Authority**  
**(NEPRA)**

**Determination of the Authority**  
**in the Matter of Generation Licence Application of**  
**Thalnova Power Thar (Private) Limited**

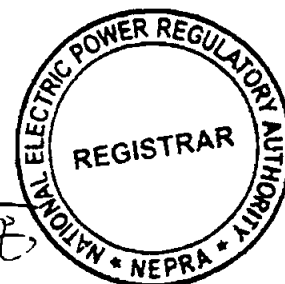
**January 24, 2017**  
**Case No. LAG-361**

**(A). Background**

(i). The electric power sector of the country is experiencing a supply-demand gap. In order to bridge the said deficit, all efforts are being made to set up generation facilities using cheaper resources. The efforts include projects by the federal as well as provincial governments.

(ii). The Government of Pakistan (GoP) has set up Private Power and Infrastructure Board (PPIB) as a one window facilitator for the entrepreneurs interested in setting up new generation facilities. In order to meet the electricity/energy needs of the country and to improve the energy mix, the GoP has decided to install generation facilities/thermal power plants mainly operating on indigenous coal. In order to implement the said initiative, PPIB has issued Letter of Intent (LoI) to various local and foreign investors/groups.

(iii). Thal Limited, Novatex Limited and Descon Engineering Limited (collectively the Sponsors) submitted a proposal to Private Power & Infrastructure Board (PPIB) for setting up a 330.00 MW Thar coal based power project at Thar Block-II, District Tharparker, in the Province of Sindh. PPIB found the proposal financially and technically viable and issued a notice to proceed on May 13, 2016 to the sponsors. In order to implement the project, the sponsors incorporated a special purpose vehicle in the name of Thalnova Power Thar (Private) Limited (TNPTPL). PPIB also issued LoI to TNPTPL on August 02, 2016 for setting up a 330.00 MW project.



**(B). Filing of Generation Licence Application**

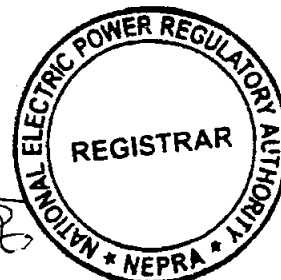
(i). In accordance with Section-15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the NEPRA Act), TNPTPL submitted an application on August 11, 2016 requesting for the grant of generation licence.

(ii). The Registrar examined the submitted application to confirm its compliance with the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 (the Licensing Regulations). The Registrar found the application in compliance with the Licensing Regulations and submitted the matter before the Authority for admission of the application for grant of generation licence or otherwise.

(iii). The Authority found the form and content of the application in substantial compliance with Regulation-3 of the Licensing Regulations. Accordingly, the Authority admitted the application for consideration of the grant of the generation licence as stipulated in Regulation-7 of the Licensing Regulations. The Authority approved the advertisement containing (a). the prospectus; (b). a notice to the general public regarding admission of the application of TNPTPL, for the purpose of inviting the general public to submit their comments in the matter as stipulated in Regulation-8 of the Licensing Regulations. The Authority also approved the list of the persons to submit their comments or otherwise to assist the Authority in the matter.

(iv). Accordingly, the advertisement was published in one Urdu and one English national newspaper on September 23, 2016. Apart from the above, separate letters were also sent to government ministries, their attached departments, representative organizations and individual experts on September 26, 2016. The said stakeholders were requested to submit their views/comments for the assistance of the Authority.

(v). Meanwhile, TNPTPL informed that in the notice of admission the total cost of the project was mentioned as US\$ 408.245 million whereas in terms of





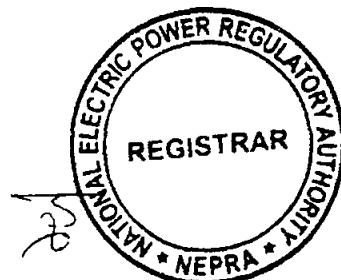
NEPRA determined tariff the cost of the project is US\$ 498.30 millions. In view of the said, TNPTPL requested that the project cost may be corrected and considered as US\$ 498.30 million. The Authority acceded to the request of TNPTPL. Accordingly, an addendum to the notice of admission was published in the press on October 10, 2016 seeking afresh comments of stakeholders.

**(C). Comments of Stakeholders**

(i). In reply to the above, comments were received from three (03) stakeholders including Energy Department Govt. of Sindh, PPIB and Ministry of Petroleum & Natural Resources. The salient points of the comments offered by the above stakeholder are summarized in the following paragraphs: -

- (a). Energy Department, Govt. of Sindh submitted that TNPTPL intends to install sub-critical circulating fluidized bed boiler with emission control through Electrostatic Precipitator (ESP) 99.9%. Energy Department, Govt. of Sindh supported the grant of generation licence to TNPTPL stating that the project is solely based on indigenous coal that will help in saving of foreign exchange, will ensure energy security of the country and will generate direct and indirect job opportunities in the region;
- (b). Ministry of Petroleum & Natural Resources commented that TNPTPL intends to install coal fired thermal power plant and as such, no gas is required for utilization. Therefore, Ministry of Petroleum and Natural Resources has no objection for the grant of generation licence;
- (c). PPIB in its comments supported the initiative of TNPTPL for investment in the power sector of Pakistan and construction of 330.00MW coal power plant.

(ii). The above comments of the stakeholders were examined and generally found in support of the grant of generation licence to the TNPTPL. In view of the above, it was considered appropriate to process the application of the



TNPTPL for the consideration of the grant of generation licence as stipulated in the Licensing Regulations and NEPRA Licensing (Generation) Rules, 2000 (the Generation Rules).

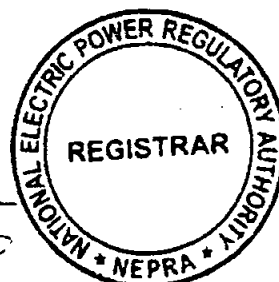
**(D). Analysis of the Authority**

(i). The Authority has examined the generation licence application of TNPTPL along with information provided with the generation licence application including feasibility study of the project, environment impact assessment study, interconnection and dispersal arrangement studies, relevant rules & regulations and the provisions of the Policy for Power Generation Projects 2015.

(ii). The applicant company (i.e. TNPTPL) is a private limited company (having Universal Incorporation No. 0099023, dated April 18, 2016) under Section 32 of the Companies Ordinance, 1984. The registered/business office of the company is Ground Floor, G&T Tower, #18 Beaumont Road, Civil Lines-10, Karachi. The memorandum of association of the company, inter alia, includes generation of electric power and its supply thereof. According to the submitted memorandum of association of the company, the total number of shares is one thousand and six (1006) of Rs. 10 each. Out of which 500 shares are owned Thal Power (Pvt.) Limited, 500 shares are with Nova Thar Powergen (Pvt.) Limited whereas, the balance six (06) shares are owned by six (06) individuals.

(iii). The project is located at Thar Coal Block-II, District Thar in the Province of Sindh. The proposed 330MW generation facility/thermal power plant will be consisting of a 1 x 330MW subcritical unit having Circulating Fluidized Bed (CFB) Boiler technology and sub-critical steam parameters (i.e. main steam 175 bar and 541 °C, single reheat steam 36 bar and 541°C). The CFB technology is particularly adept at burning low-grade, high-ash coals and co-firing with other low-grade waste materials.

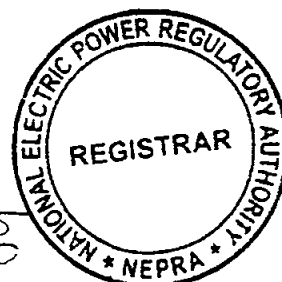
(iv). For operation of the plant, lignite coal will be supplied from the adjacent mine through trucks, which is most feasible and economical option. The trucks will unload the lignite coal at the unloading station which has a capacity of



1000t/h and is sufficient for 330 MW unit. There is also an option of conveyer belt from mine to plant but that can be used later in the regular stage and trucks will be used as a backup option.

(v). The selected main parameters of the steam turbine and boiler of the project (i.e. main steam 175 bar and 541°C) are at the higher end of the subcritical class and produce higher efficiency. The high efficiency of the selected system and the low cost of coal fuel will generate the low cost power and make an economically feasible solution to relieve power shortages in Pakistan. The efficiency of the proposed generation facility/thermal power plant will be more than 37%.

(vi). The Authority has observed that the operation of the proposed coal power plant will generate major waste in the form of ash, waste water and gaseous emission. In this regard, TNPTPL has ensured to adopt adequate measures to cover all these issues. The ash will be stored temporarily on site until it is transported to mine area for final disposal where it will be used as a backfill in the spent mine pit. The dumped ash will be compacted, mixed with sand and given leaching protection. The waste water from the plant will be treated and stored for recycling in the process stream, suppressing coal and ash dust and for landscaping. A sewage treatment plant will treat sewage from the housing complex and construction camp. Waste water from the sewage plant will be discharged or recycled in appropriate processing stream. Non-recycled waste water from the project will be disposed through a 50 cusec drainage and waste water effluent channel being prepared by the Govt. of Sindh. Main gaseous emissions from the plant include sulfur dioxide (SO<sub>2</sub>) and nitrogen oxide (NO<sub>x</sub>) along with particulate matters emission. For treatment of flue gas, the steam generator is equipped with dry Electrostatic Precipitator (ESP) with efficiency greater than 99.9% and desulfurization efficiency of greater than 90% which is achieved by injection of limestone in the CFB boiler. For NO<sub>x</sub> control, low NO<sub>x</sub> burner will be used. Further, proper arrangement will be made for disposal of ashes/combustion and FGD residues. Depending upon the emissions limits imposed on the plant, direct injection of limestone into the bed is often sufficient to meet SO<sub>2</sub> removal

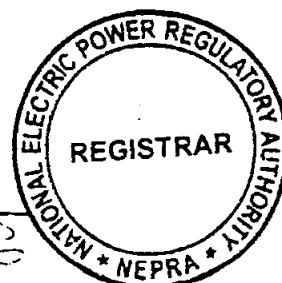


requirements, without the additional desulfurization equipment found on pulverized coal power plants. The emission control system will make the technology environmentally friendly. In this regard, TNPTPL has carried out Environmental and Social Impact Assessment (ESIA) study to ensure compliance with the relevant environment standards and Environmental Protection Agency, Govt. of Sindh (EPA, Sindh) has issued NOC in the matter.

(vii). Regarding system studies of the project, the Authority has observed that TNPTPL has submitted interconnection study of the project, which has been carried out by Planning Department of Power Planners International. According to the said study, the electric power generated by the proposed generation facility of TNPTPL will be evacuated by looping in-out 500 kV circuit between Engro Coal Fired Power Plant and Matiari Converter Station. In this regard, NTDC through its letter dated December 12, 2016 has accorded its approval for the interconnection studies. Further, CPPA-G through its letter dated April 13, 2016 has provided its consent for procuring power from the generation facility of TNPTPL.

(viii). Regarding land of the project, the Authority has observed that Sindh Engro Coal Mining Company has confirmed that it has initially allocated 110 Acres of land to TNPTPL, near Islamkot, Thar Block-II, District Tharparker, in the Province of Sindh. The land has been allocated for establishment of indigenous coal based thermal power plant and coal yard etc.

(ix). The Authority has observed that the least cost option criteria as envisaged in Rule-3(5) of the Generation Rules, includes several factors i.e. (a). sustainable development or optimum utilization of the renewable or non-renewable energy resources proposed for generation of electric power; (b). the availability of indigenous fuel and other resources; (c). the comparative costs of the construction, operation and maintenance of the proposed generation facility against the preferences indicated by the Authority; (d). the costs and rights-of-way considerations related to the provision of transmission and interconnection facilities; (e). the constraints on the transmission system likely to result from the proposed generation facility and the costs of the transmission system expansion



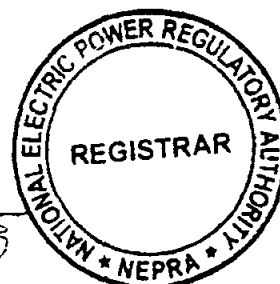
required to remove such constraints; (f). the short-term and the long-term forecasts for additional capacity requirements; (g). the tariffs resulting or likely to result from the construction or operation of the proposed generation facility; and (h). the optimum utilization of various sites in the context of both the short-term and the long-term requirements of the electric power industry as a whole. The Authority considers that the proposed plant of TNPTPL will be helpful for sustainable development as it will be utilizing indigenous coal (cheaper fuel) of Thar block-II, which will result in less per unit cost of electricity to CPPA-G. The plant will be connected to the proposed 500kV system of NTDC which is at a distance of 5-km from it, for which right of way and space at terminal substation would be available. In this regard, NTDC has accorded its approval for the interconnection arrangement, CPPA-G has provided its consent for procuring power from TNPTPL and EPA, Sindh has issued NOC for the project. Further, TNPTPL has unconditionally accepted the upfront coal tariff. In view of the said, the Authority is of the considered opinion that project of TNPTPL fulfills the least-cost option criteria as envisaged in the Rule-3(5) of the Generation Rules.

(x). In view of the above, the Authority is of the considered opinion that TNPTPL qualifies for the grant of generation licence in terms of NEPRA Act, the Generation Rules and the Licensing Regulations.

### (E). Grant of Generation Licence

(i). Sustainable and affordable electric power is a key and lifeline for the socio-economic development of any country. In fact, the economic growth of any country is directly linked with the availability of safe, secure, reliable and cheaper supply of electricity. The electricity consumption per capita has a strong correlation to the Social Development Indices (Human Development Index-HDI, life expectancy at birth, infant mortality rate, and maternal mortality) and Economic Indices (such as GDP per capita etc.).

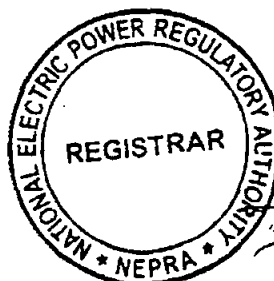
(ii). Increasing electricity consumption per capita can directly stimulate faster economic growth and indirectly achieve enhanced social development. In



short, the economic growth of any country is directly linked with the availability of safe, secure, reliable and cheaper supply of electricity. In view of the said, the Authority is of the considered opinion that for sustainable development, all types of electric power generation resources including coal, hydel, wind, solar and other renewable energy resources must be tapped and developed on priority basis both in public and private sectors.

(iii). The current energy mix of the country is skewed towards the costlier thermal generation facilities/power plants operating on furnace oil. The import of relatively expensive furnace oil results in depletion of the precious foreign exchange reserves of the country affecting the macro and micro stability of the country. In view of the said, an increase in the consumer end tariff is experienced which not only results in higher inflation but it also affects the competitiveness of the local industry with its foreign peers. In order to address the said issues, the Authority considers it imperative that efforts must be made to change the energy mix towards cheaper fuels. With the depleting natural gas reserves in the country and relatively longer lead time for the construction of hydro electric power projects, the coal power plants are considered to be the best option in the short and medium term planning. Therefore, to reduce the demand-supply gap and to achieve sustainable development, it is vital that coal projects are given priority for power generation and their development is encouraged. In view of the said, the Council of Common Interests (CCI) approved the Power Policy 2015 which envisages rationalizing the energy mix and reducing the demand-supply gap through imported and indigenous coal based power generation. In consideration of the said, the Authority is of the view that the proposed project of TNPTPL is consistent with the provisions of Power Policy 2015.

(iv). The term of a generation licence under the Rule-5 of the Generation Rules is to be commensurate with the maximum expected useful life of the units comprised in a generating facility. Further, as per the International benchmarks available, the useful life of a steam turbine is normally taken as thirty (30) years from its Commercial Operation Date (COD). TNPTPL has confirmed that based on the up-front tariff determined by the Authority for Thar coal projects, it will be negotiating a Power Purchase Agreement (PPA) with CPPA-G for a period of



Thirty (30) years. In view of the said, the Authority hereby fixes the term of the proposed generation licence of TNPTPL as thirty (30) years from COD of the project.

(v). Regarding tariff that the company will charge from the Power Purchaser/CPPA-G, it is clarified that under Section-7(3)(a) of the NEPRA Act, determination of tariff, rate and charges etc. is the sole prerogative of the Authority. In this regard, the Authority through its determination No. NEPRA/TRF-367/TPTPL-2016/14217-14219 dated October 18, 2016 has granted an up-front tariff to TNPTPL for its project. The Authority directs TNPTPL to follow the terms and conditions of the granted up-front tariff in letter and spirit and charge the power purchaser only such tariff which has been determined, approved or specified by the Authority.

(vi). Regarding compliance with the environmental standards, the Authority directs TNPTPL to ensure that the project will comply with the environmental standards during the term of the generation licence. In view of the said, the Authority has included a separate article (i.e. Article-10) in the generation licence along with other terms and conditions that the licensee will comply with relevant environmental standards. Further, the Authority directs TNPTPL to submit a report on a bi-annual basis, confirming that operation of its generation facility/thermal power plant is compliant with required environmental standards as prescribed by the concerned environmental protection agency.

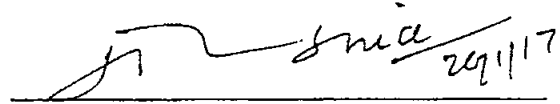
(vii). Regarding land of the project, it is clarified that Sindh Engro Coal Mining Company has allocated 110 Acres of land to TNPTPL, near Islamkot, Thar Block-II, District Tharparker, in the Province of Sindh as mentioned in the Schedule-I of the generation licence. In this regard, the Authority directs TNPTPL that the aforementioned land shown in schedule-I shall be exclusively used for the proposed coal power plant and TNPTPL cannot carry out any other activity on this land except with prior approval of the Authority.



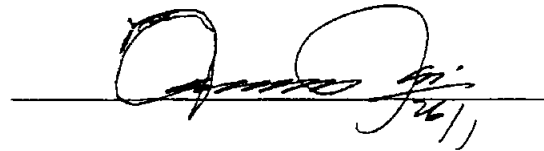
In view of the above, the Authority hereby approves the grant of generation licence to TNPTPL on the terms and conditions set out in the generation licence annexed to this determination. The grant of generation licence will be subject to the provisions contained in the NEPRA Act, relevant rules, regulations framed there under and the other applicable documents.

**Authority:**

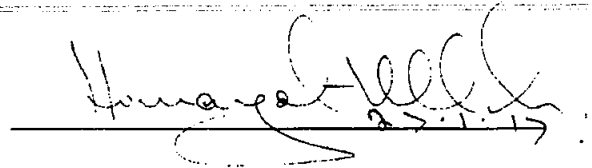
Maj. (R) Haroon Rashid  
(Member)

 24/1/17

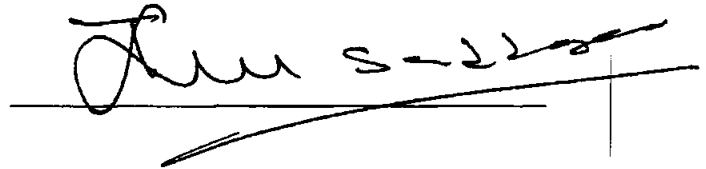
Syed Masood-ul-Hassan Naqvi  
(Member)

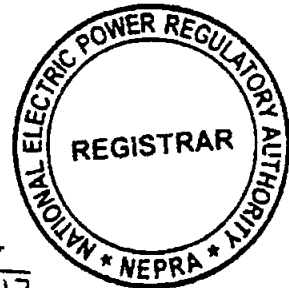
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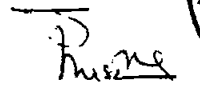
Himayat Ullah Khan  
(Member/Vice Chairman)

 25.1.17

Tariq Sadozai  
(Chairman)





  
21.02.17



**National Electric Power Regulatory Authority  
(NEPRA)  
Islamabad – Pakistan**

**GENERATION LICENCE**

**No. IGSP/L/75/2017**

In exercise of the Powers conferred upon the National Electric Power Regulatory Authority (NEPRA) under Section-15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, the Authority hereby grants Generation Licence to:

**THALNOVA POWER THAR (PRIVATE) LIMITED**

Incorporated Under Section-32  
of the Companies Ordinance, 1984 (XL VII of 1984) Having Corporate  
Universal Identification No.0099023, Dated April 18, 2016

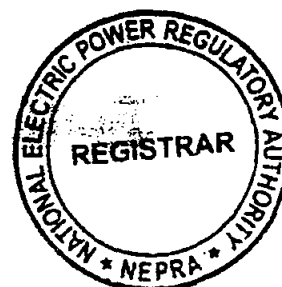
**for its Indigenous/Thar Coal Based Thermal Generation Facility Located  
near Islamkot, Thar Coal Block-II, District Tharparker, In the Province of  
Sindh**

(Installed Capacity: 330.00 MW Gross)

to engage in generation business subject to and in accordance with  
the Articles of this Licence.

Given under my hand on 01<sup>st</sup> day of February  
Thousand & Seventeen and expires on 30<sup>th</sup> day of  
December Two Thousand & Forty Nine.

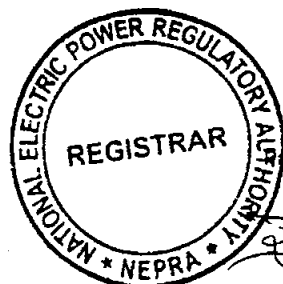
01.02.17  
Registrar



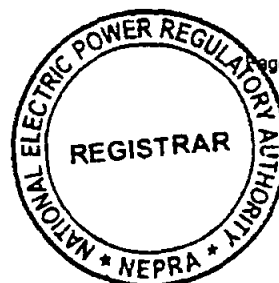
**Article-1**  
**Definitions**

**1.1 In this Licence**

- (a). "Act" means "the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997";
- (b). "Applicable Documents" mean the Act, the NEPRA rules and regulations, any documents or instruments issued or determinations made by the Authority under any of the foregoing or pursuant to the exercise of its powers under the Act, the grid code, the applicable distribution code, if any, or the documents or instruments made by the licensee pursuant to its generation licence, in each case of a binding nature applicable to the licensee or, where applicable, to its affiliates and to which the licensee or any of its affiliates may be subject;
- (c). "Authority" means "the National Electric Power Regulatory Authority constituted under Section-3 of the Act";
- (d). "Bus Bar" means a system of conductors in the generation facility of the Licensee on which the electric power of all the generators is collected for supplying to the Power Purchaser;
- (e). "Commercial Operations Date (COD)" means the Day immediately following the date on which the generation facility of the Licensee is Commissioned;
- (f). "CPPA-G" means "the Central Power Purchasing Agency (Guarantee) Limited" or any other entity created for the like purpose;



- (g). "Grid Code" means the grid code prepared by NTDC and approved by the Authority, as it may be revised from time to time by NTDC with any necessary approval by the Authority;
- (h). "IEC" means International Electrotechnical Commission or any other entity created for the like purpose and its successors or permitted assigns;
- (i). "IEEE" means the Institute of Electrical and Electronics Engineers and its successors or permitted assigns;
- (j). "Interconnection Point" the physical point or points where the generation facility and the Grid System are to be connected;
- (k). "Law" means the Act, relevant rules and regulations made there under and all the Applicable Documents;
- (l). "Licensee" means "Thalnova Power Thar (Private) Limited" and its successors or permitted assigns;
- (m). "NTDC" means National Transmission and Despatch Company Limited and its successors or permitted assigns;
- (n). "Power Purchase Agreement" means the power purchase agreement, entered or to be entered into by and between the Power Purchaser and the Licensee, for the purchase and sale of electric energy generated by the generation facility, as may be amended by the parties thereto from time to time;
- (o). "Power Purchaser" means the CPPA-G purchasing power on behalf of XW-DISCOs from the Licensee, pursuant to Power Purchase Agreement;
- (p). "Regulations" mean "the National Electric Power Regulatory



Authority Licensing (Application & Modification Procedure)  
Regulations, 1999 as amended or replaced from time to time";

- (q). "Rules" mean "the National Electric Power Regulatory Authority  
Licensing (Generation) Rules, 2000";
- (r). "XW DISCO" means "an Ex-WAPDA distribution company  
engaged in the distribution of electric power".

1.2 Words and expressions used but not defined herein bear the meaning given  
thereto in the Act or rules and regulations issued under the Act.

**Article-2**  
**Applicability of Law**

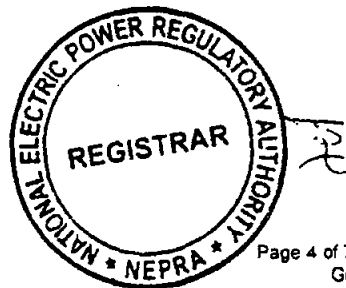
This Licence is issued subject to the provisions of the Applicable Law, as  
amended from time to time.

**Article-3**  
**Generation Facilities**

3.1 The location, size (capacity in MW), technology, interconnection  
arrangements, technical limits, technical and functional specifications and other  
details specific to the generation facility of the Licensee are set out in Schedule-I of  
this Licence.

3.2 The net capacity of the generation facility of the Licensee is set out in  
Schedule-II hereto.

3.3 The Licensee shall provide the final arrangement, technical and financial  
specifications and other specific details pertaining to its generation facility before its  
COD.



**Article-4**  
**Term of Licence**

4.1 The Licence is granted for a term of thirty (30) years from the COD of the generation facility.

4.2 Unless suspended or revoked earlier the Licensee may apply for renewal of this licence ninety (90) days prior to the expiry of the above term as stipulated in the Regulations.

**Article-5**  
**Licence fee**

After the grant of the Generation Licence, the Licensee shall pay to the Authority the Licence fee, in the amount and manner and at the time set out in the National Electric Power Regulatory Authority (Fees) Rules, 2002.

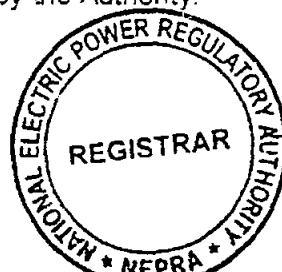
**Article-6**  
**Tariff**

The Licensee shall charge only such tariff which has been determined, approved or specified by the Authority.

**Article-7**  
**Competitive Trading Arrangement**

7.1 The Licensee shall participate in such manner as may be directed by the Authority from time to time for development of a Competitive Trading Arrangement. The Licensee shall in good faith work towards implementation and operation of the aforesaid Competitive Trading Arrangement in the manner and time period specified by the Authority. Provided that any such participation shall be subject to any contract entered into between the Licensee and another party with the approval of the Authority.

7.2 Any variation or modification in the above-mentioned contracts for allowing the parties thereto to participate wholly or partially in the Competitive Trading Arrangement shall be subject to mutual agreement of the parties thereto and such terms and conditions as may be approved by the Authority.



**Article-8**  
**Maintenance of Records**

For the purpose of sub-rule (1) of Rule-19 of the Rules, copies of records and data shall be retained in standard and electronic form and all such records and data shall, subject to just claims of confidentiality, be accessible by authorized officers of the Authority.

**Article-9**  
**Compliance with Performance Standards**

The Licensee shall comply with the relevant provisions of the National Electric Power Regulatory Authority Performance Standards (Generation) Rules 2009 as amended from time to time.

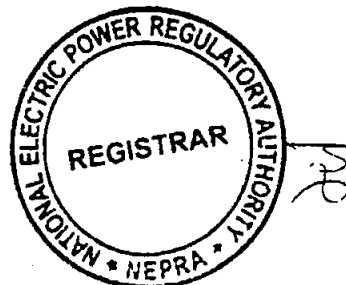
**Article-10**  
**Compliance with Environmental Standards**

10.1 The Licensee at all times shall comply with the environmental standards as may be prescribed by the relevant competent authority as amended from time to time.

10.2 The Licensee shall provide a certificate on a bi-annual basis, confirming that the operation of its generation facility is in line with environmental standards as prescribed by the relevant competent authority.

**Article-11**  
**Power off take Point and Voltage**

The Licensee shall deliver power to the Power Purchaser at the outgoing Bus Bar of its grid station. The up-gradation (step up) of generation voltage up to the required voltage level for Interconnection Point will be the responsibility of the Licensee.



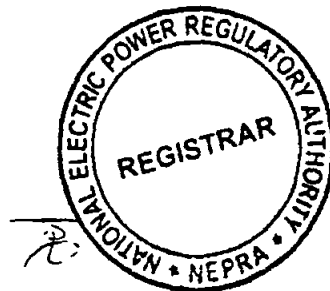
**Article-12**  
**Provision of Information**

12.1 The obligation of the Licensee to provide information to the Authority shall be in accordance with Section-44 of the Act.

12.2 The Licensee shall be subject to such penalties as may be specified in the relevant rules made by the Authority for failure to furnish such information as may be required from time to time by the Authority and which is or ought to be or has been in the control or possession of the Licensee.

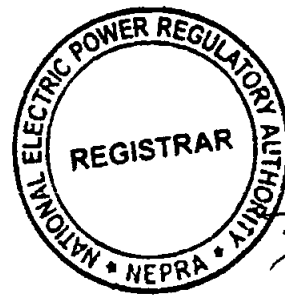
**Article-13**  
**Design & Manufacturing Standards**

All the components of the generation facility/power plant shall be designed, manufactured and tested according to the latest IEC, IEEE or any other equivalent standards. All plant and equipment shall be unused and brand new.



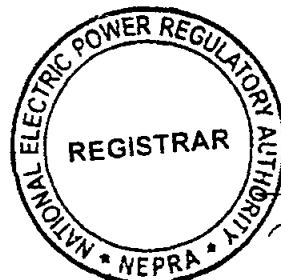
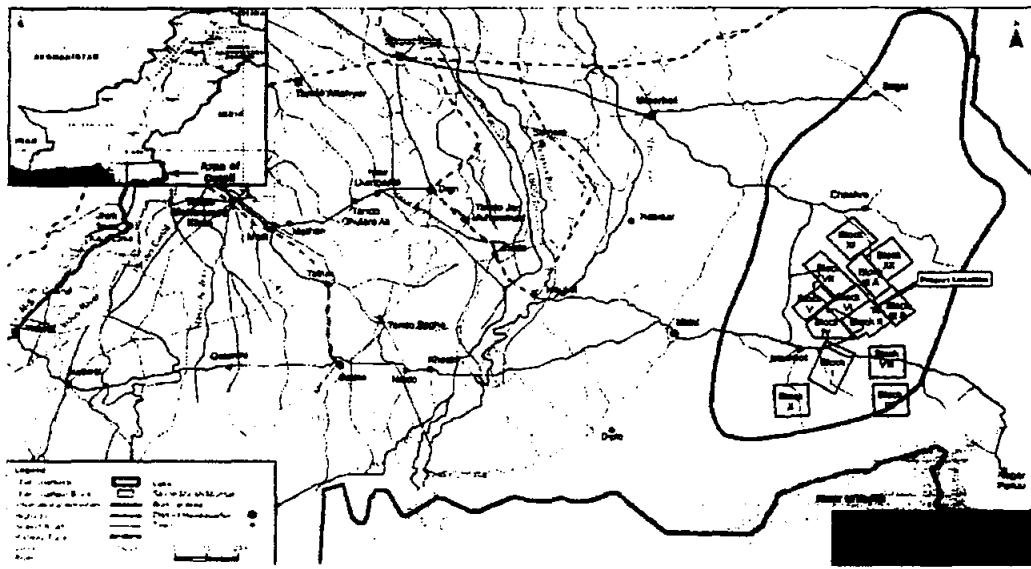
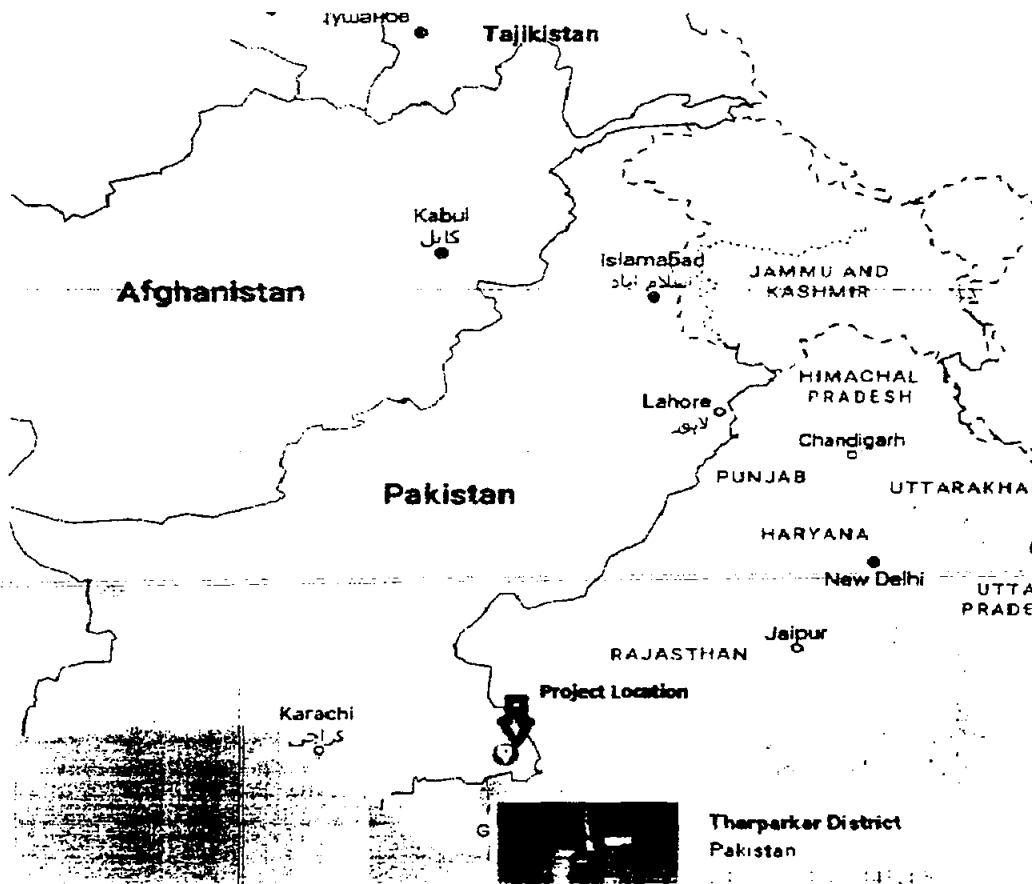
## **SCHEDULE-I**

The Location, Size (i.e. Capacity in MW), Type of Technology, Interconnection Arrangements, Technical Limits, Technical/Functional Specifications and other details specific to the Generation Facilities of the Licensee are described in this Schedule

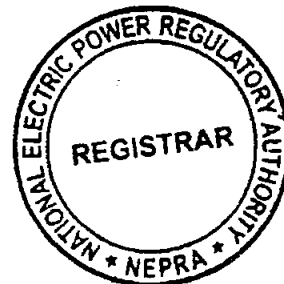
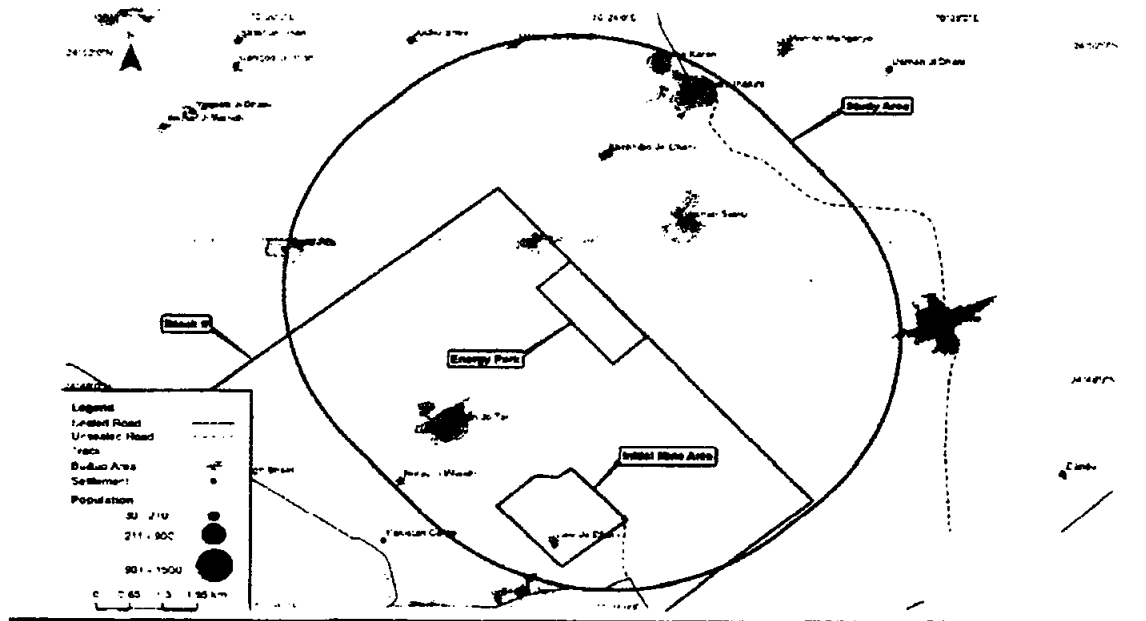




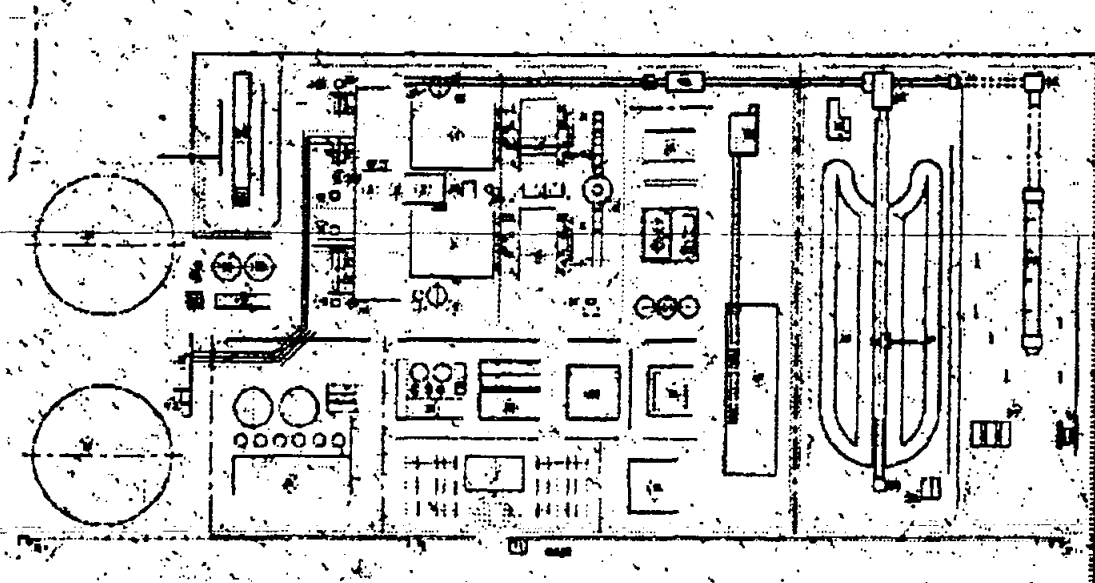
## Location of the Generation Facility/Thermal Power Plant



**Location**  
**of the Generation Facility/Thermal Power Plant**



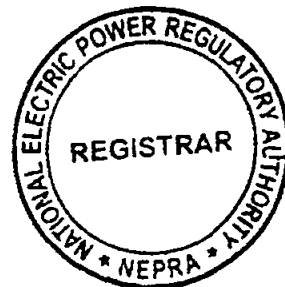
## Layout and Land Coordinates of the Generation Facility/Thermal Power Plant



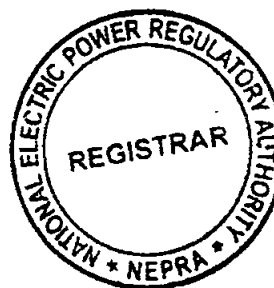
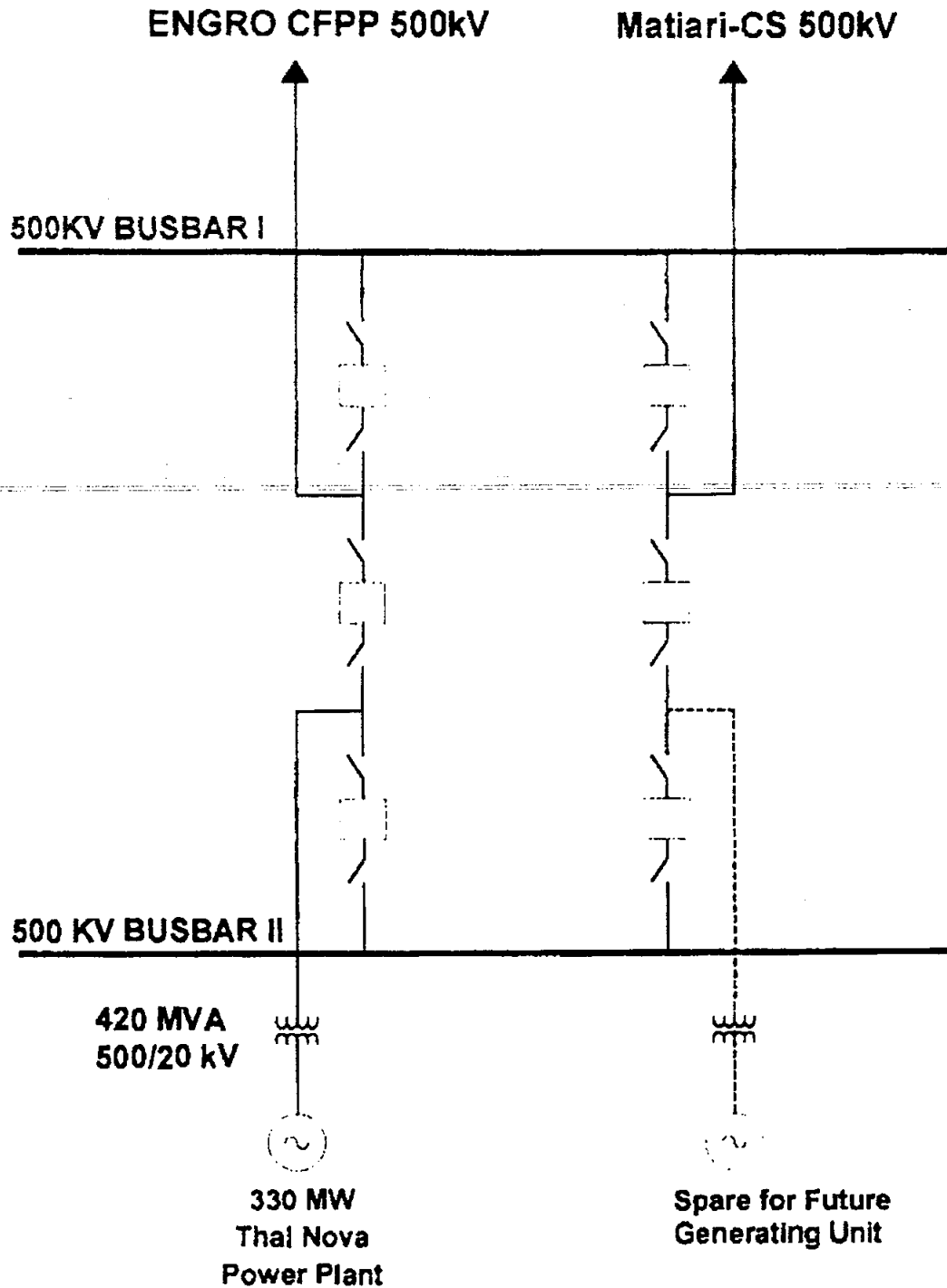
**Project Land: 110 Acres**

**Land Coordinates (NE)**

Boundary	Latitude (N)	Longitude (E)
Boundary A	24°48'42.57"	70°21'48.57"
Boundary B	24°49'3.18"	70°21'48.57"
Boundary C	24°49'14.51"	70°21'48.57"
Boundary D	24°48'54.05"	70°21'48.57"



**Single Line Diagram**  
**of the Generation Facility/Thermal Power Plant**

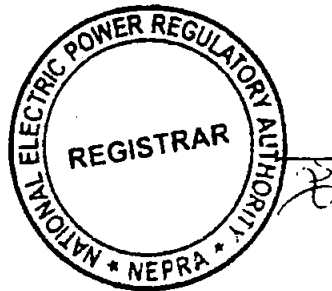


**Interconnection Facilities/  
Transmission Arrangements for Dispersal of Power from the  
Generation Facility/ Thermal Power Plant**

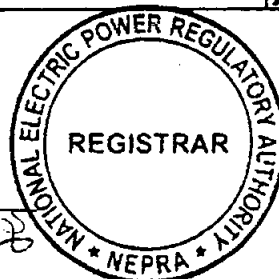
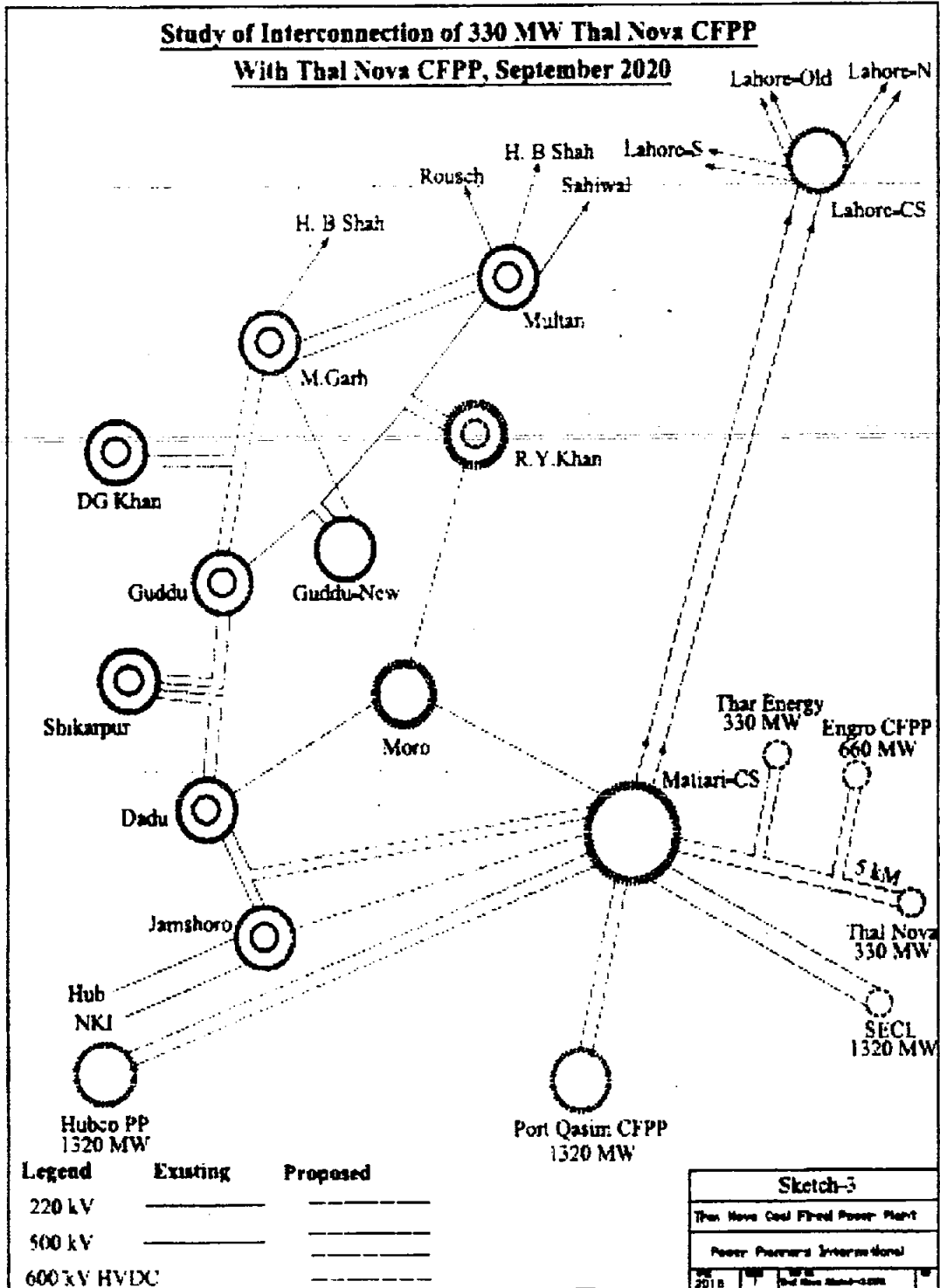
The electric power from the Coal based generation facility of Thalnova Power Thar (Private) Limited (TNPTPL) will be dispersed to the National Grid.

(2). The interconnection facilities /transmission arrangement for supplying to National Grid from the above mentioned generation facility shall be at 500 kV level. The Interconnection/Dispersal Arrangement will be consisting of looping in-out arrangement of 500 kV circuit between Engro Coal Fired Power Plant and Matiari Converter Station.

(3). Any change in the above mentioned interconnection facilities /transmission arrangement for dispersal of electric power as agreed by the Licensee and the Power Purchaser shall be communicated to the Authority in due course of time.



# **Schematic Diagram** **of Interconnection Arrangement for Dispersal of Power from the** **Generation Facility/ Thermal Power Plant**



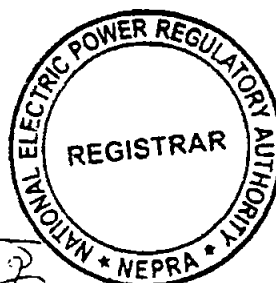
**Details**  
**Of the Generation Facility/**  
**Thermal Power Plant**

**(A). General Information**

(i).	Name of Company/Licensee	Thalnova Power Thar (Private) Limited
(ii).	Registered /Business Office	Ground Floor, G&T Tower, #18 Beaumont Road, Civil Lines-10, Karachi.
(iii).	Location of the Generation Facility	near Islamkot, Thar Coal Block-II, District Tharparker, in the Province of Sindh
(iv).	Type of Generation Facility	Mine Mouth Lignite fired power generation

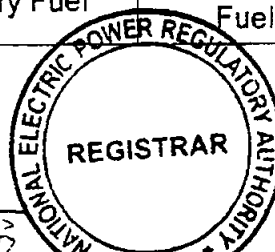
**(B). Plant Configuration**

(i).	Installed Capacity/ Plant Size of the Generation Facility	330.00 MW	
(ii).	Type of Technology	Sub-critical parameters with Circulating Fluidized Bed Boiler (CFB) Technology	
(iii).	Number of Units/Size (MW)	1 x 330.00 MW	
(iv).	Unit Make/Model/Type & Year of Manufacture etc.	Boiler	CFB Boiler with Sub-critical Steam Parameters of GE-Alstom or Equivalent
		Steam turbine	GE-Alstom or Equivalent
		Generator	GE-Alstom or Equivalent
(v).	COD of the Generation Facility (Expected)	December 31, 2019	
(vi).	Expected Useful Life of the Generation Facility from COD	30 years	



**(C). Fuel/Raw Material Details**

(i).	Primary Fuel	Thar Block-II Lignite		
(ii).	Alternative Fuel	Imported Coal (Indonesian/Equivalent)		
(iii).	Start-Up Fuel	High Speed Diesel		
(iv).	Fuel Source f	Primary Fuel	Alternative Fuel	Start-Up
		Lignite Coal from Thar Block-II	To be imported from Indonesia or equivalent	Indigenous/ Imported
(v).	Fuel Supplier	Primary Fuel	Alternative Fuel	Start-Up
		The main fuel source is indigenous, produced from Thar Block-II lignite mine, owned & operated by Sindh Engro Coal Mining Company (SECMC)	To be imported from Indonesia or equivalent	PSO/ Equivalent
(vi).	Supply Arrangement	Primary Fuel	Alternative Fuel	Start-Up Fuel
		Via Trucks/ Conveyer Belt from Thar Block-II Mine to Generation Facility	Via trucks from Karachi Port	Via Trucks to Generation Facility
(vii).	No. of Storage Bunkers/Tanks/ Open Yard	Primary Fuel	Alternative Fuel	Start-Up Fuel
		Open stockyards	Open stockyard	Two Oil tanks
	Storage Capacity of each Bunkers/	Primary Fuel	Alternative Fuel	Start-Up Fuel





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

**(D). Emission Values**

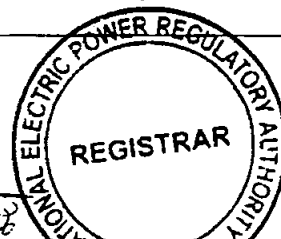
		Primary Fuel	Alternative Fuel	Start-Up Fuel
(i).	SO <sub>x</sub> (mg/Nm <sup>3</sup> )	<850	<850	<850
(ii).	NO <sub>x</sub> (mg/Nm <sup>3</sup> )	<510	<510	<510
(iii).	Particulate Matter (mg/Nm <sup>3</sup> )	<100	<100	-

**(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
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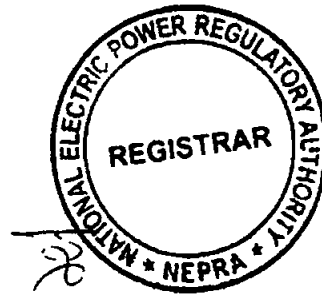
**(F). Plant Characteristics**

(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



## **SCHEDULE-II**

The Installed/ISO Capacity (MW), De-Rated Capacity at Mean Site Conditions (MW), Auxiliary Consumption (MW) and the Net Capacity At Mean Site Conditions (MW) of the Generation Facilities of Licensee are given in this Schedule

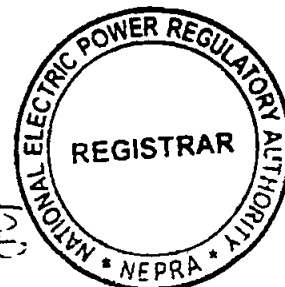


## **SCHEDULE-II**

(1).	Total Gross Installed Capacity of the Generation Facility	330.00 MW
(2).	De-rated Capacity of Generation Facility at Reference Site Conditions	330.00 MW
(3).	Auxiliary Consumption of the Generation Facility	29.70 MW
(4).	Total Installed Net Capacity of Generation Facility at Reference Site Conditions	300.3 MW

**Note**

All the above figures are indicative as provided by the Licensee. The net capacity available to power purchaser for dispatch will be determined through procedure(s) contained in the power purchase agreement or any other applicable document(s).



**BEFORE**  
**THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY**

APPLICATION FOR MODIFICATION OF  
GENERATION LICENSE NO. IGSP/75/2017 DATED February 01, 2017

ON BEHALF OF

**ThalNova Power Thar (Pvt) Limited (TNPTL)**

PURSUANT TO REGULATION 9(1A) OF THE NEPRA (APPLICATION,  
MODIFICATION, EXTENSION AND CANCELLATION) PROCEDURE REGULATIONS, 2021), READ  
TOGETHER WITH THE REGULATION OF GENERATION, TRANSMISSION AND DISTRIBUTION OF  
ELECTRIC POWER ACT, 1997 AND ALL OTHER ENABLING PROVISIONS OF LAW

**Dated XX January 2023**

## CORRIGENDUM

Thar Energy Limited (TEL) is pleased to make the following amendments to the Generation License Modification Application submitted vide letter TEL-NEPRA-SM-05 dated December 07, 2022.

1. In paragraph 2.1 of section 2, table has been modified. Hold Time is added and ramp rate for Warm Start is changed from 0.8%/Min to 0.67%/Min. The ramping rates (MW/min) set out in row V of table F of the schedule 1 of the Generation License (under the heading "Detail of Generation Facility / Power Plant are proposed to be written as follows:

Complex NET load range % age	Cold Start (% / Min)	Warm Start (%/Min)	Hot Start (% /Min)
<u>0 – 25 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
Hold Time	10 minutes		
<u>25 – 50 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
Hold Time	10 minutes		
<u>50 – 75 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
Hold Time	10 minutes		
<u>75 – 90 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
Hold Time	10 minutes		
<u>90 – 100 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
<u>Total Time</u>	<u>326 minutes</u>	<u>189 minutes</u>	<u>140 minutes</u>

2. In paragraph 3.1 Rationale for the Modification to Ramping rate of section 3, point (e) has been added that mentions the reasons for adding Hold Time and ramp rate of Warm Start. Also, load profiles for Cold, Warm and Hot startups provided by OEM are mentioned as Annexures 1A/1B/1C.
3. In paragraph 3.2 Rationale for the Modification to the Time required for the Synchronization of the Grid, section has been revised based on the Startup curves provided by OEM, which is mentioned as Annexure 2.

For the ease of understanding, the revised draft of attachment 04 "License Proposed Modification Application" incorporation of all changes is attached herewith.

**BEFORE**  
**THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY**

**APPLICATION FOR MODIFICATION OF**  
**GENERATION LICENSE NO. IGSPL/83/2017 DATED JUNE 07, 2017**  
**ON BEHALF OF**

**THAR ENERGY LIMITED (TEL)**

**PURSUANT TO REGULATION 9(1A) OF THE NEPRA (APPLICATION,  
MODIFICATION, EXTENSION AND CANCELLATION) PROCEDURE REGULATIONS, 2021), READ  
TOGETHER WITH THE REGULATION OF GENERATION, TRANSMISSION AND DISTRIBUTION OF  
ELECTRIC POWER ACT, 1997 AND ALL OTHER ENABLING PROVISIONS OF LAW**

**Dated XX Oct 2022**

## 1 DETAILS OF THE PETITIONER

### 1.1 Name and Address

Name:	Thar Energy Limited
Address:	09th Floor, Ocean Tower Block-9, Main Clifton Road Karachi, 75600, Pakistan
Phone:	+92 21 3587 4677-86 +92 21 3583 9018
Fax:	+92 21 3587 0397

### 1.2 Particulars of Authorized Representative

Name:	Mr. Saleemullah Memon
Designation:	Chief Executive Officer

### 1.3 Particulars of Authorized Representative

Thar Energy Limited (the “Company”) is private limited Company incorporated under the laws of Pakistan and is establishing a 330MW indigenous Thar coal based thermal generation facility located at Thar Coal Block-II, Village Singharo-Bitra in Taluka Islamkot, District Tharparkar, in the province of Sindh.

NEPRA granted the Company Generation License NO. IGSP/L/83/2017 DATED JUNE 07, 2017 (the “Generation License”) under section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

## 2 PROPOSED MODIFICATION

Pursuant to Regulation 10(1) of the 2021 Regulations, Company hereby applies for the following modifications to the specification 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 the schedule 1 of the Generation License (under the heading “Detail of Generation Facility / Power Plant are proposed to be written as follows:

Complex NET load range % age	Cold Start (% / Min)	Warm Start (%/Min)	Hot Start (% /Min)
<u>0 – 25 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
Hold Time	10 minutes		
<u>25 – 50 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
Hold Time	10 minutes		
<u>50 – 75 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
Hold Time	10 minutes		

<u>75 – 90 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
Hold Time	10 minutes		
<u>90 – 100 %</u>	<u>0.35</u>	<u>0.67</u>	<u>1.00</u>
<u>Total Time</u>	<u>326 minutes</u>	<u>189 minutes</u>	<u>140 minutes</u>

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

<b>Length of Shutdown</b>	<b>Notice Required to Synchronize (The time start after boiler ignited)</b>
Not more than 2 hours	100 min
More than 2 hours but less than 8 hours	150 min
More than 8 hours but less than 32 hours	360 min
More than 32 hours but less than 150 hours	550 min
More than 150 hours	770 min

### 3 STATEMENT OF THE REASON IN SUPPORT OF THE MODIFICATION

The above modifications to 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 filling 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 requirement of the power plant and the data and instructions provided by the manufacturer to the Company.

Consistent with NEPRA determination in the matter of similar IPPs modification application and Article 3.2 of Generation License, The Company hereby requesting modification of its Generation License in light of actual design of the power plant and the data provided and instruction 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 the modification to Ramping Rates

Modification to the Ramping rates is necessary because:

- a. TEL power plant is equipped with a Circulating Fluidized Bed (CFB) boiler and Thar lignite coal combusted. For CFB boiler, the normal ramp rate is no more than 1%Pe/min for Hot startup, 0.67% Pe/min and 0.35% Pe/min for Warm and Cold startup respectively.
- b. High moisture lignite coal is combusted, and some residence time required to ensure proper burning. If the Ramping rate is not followed, the circulation and heating of the furnace cannot be ensured, faster ramp rate may cause excess coal feed to furnace in low temperature condition, which may result in localized explosion, ash fusion and clinker formation in Boiler. Therefore, the modification to the Ramp rate, set out in paragraph 2. 1 above, has been proposed to ensure safe and efficient operation of the power plant.
- c. Meanwhile, the ramp rate is crucial to ensure proper heating of the Boiler, Steam Turbine, and Steam pipelines to avoid exceed thermal stress. If the Ramping rate is not limited, it may cause an adverse change in the airflow, distribution of coal, and difficulty in achieving thermal & chemical equilibrium for the CFB boiler, which may impact the system parameters like steam pressure, steam temperature etc. adversely. Under these circumstances, the boiler may overheat or leak. Furthermore, heat stress protection on the cylinder metal will be triggered and load ramping will be limited by GE TCS system, or even the operational life span of turbine may be affected.
- d. According to Chinese relevant standards, the Ramp rate of CFB unit should be limited no more than 1%Pe/min, to ensure main system parameters are properly under controlled, such as boiler bed temperature, primary air pressure, second air flow, drum level, main steam pressure, main/reheat steam temperature, etc. Ramp rate of TEL Power Plant shall be limited within 1%Pe/min for Hot startup, 0.67% Pe/min and 0.35% Pe/min for Warm and Cold startup respectively.
- e. Based on recent operational experience of CFB boiler at TEL plant and operational practices of other plants of similar technology, Hold Time is added after every step load change and ramp rate for Warm Start is changed, for normalizing the operational parameters like furnace pressure, steam pressure, steam temperature and to avoid any undue stresses on the machine. Thermal stresses were quite evident and seen on different parts of the CFB boiler during recent planned outage of TEL plant, therefore, the above-mentioned changes are done per OEM/EPC recommendations, to avoid any damage to plant machinery.

Annexure 1: Start-up Load Profiles

### 3.2 Rationale for the modification to the Time required for the Synchronization to the Grid

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

**More than 150 hours: Total 770 Minutes**, wherein, 200 minutes are required auxiliary boiler start and auxiliary steam system warm up, as well as for boiler water purity & pressure raising; 500 minutes are required for CFB boiler to setup temperature and pressure after the successful ignition: hot flushing time of 30 minutes in addition to Boiler Startup time to achieve the steam purity is required; Then, 40 minutes are required for turbine rolling and synchronization to grid. Therefore total 770 minutes are required for unit startup.

**More than 32 hours and less than 150 hours: Total 550 Minutes** wherein 200 minutes are required for auxiliary boiler start and auxiliary steam system warm up, as well as for boiler water purity & pressure raising, 290 minutes are required for CFB boiler to setup temperature and pressure after the successful ignition: hot flushing time of 30 minutes is needed; Then, 30 minutes are required for turbine rolling and synchronization to grid. Therefore total 550 minutes are required for unit startup.

**More than 8 hours and less than 32 hours: Total 360 Minutes** wherein 200 minutes are required for auxiliary boiler start and auxiliary steam system warm up, as well as for boiler water purity and pressure raising; 145 minutes are required for CFB boiler to set up temperature and pressure after the successful ignition; Then, 15 minutes are required for turbine rolling and synchronization to grid. Therefore total 360 minutes are required for unit startup.

**More than 2 hours less than 8 hours: Total 150 minutes**, wherein 135 minutes are required for CFB boiler to set up temperature and pressure after the successful ignition; Then, 15 minutes are required for turbine rolling and synchronization to grid. Therefore, total 150 minutes are required for unit start-up.

**Not more than 2 hours: Total 100 minutes**, wherein 85 minutes are required for CFB boiler to set up temperature and pressure after the successful ignition; Then, 15 minutes are required for turbine rolling and synchronization to grid. Therefore, total 100 minutes are required for unit start-up.

Annexure 2: Startup curves

## 4 STATEMENT OF THE 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 1 x 330 MW Coal Power 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 perform its obligations effectively and efficiently under the Generation License.
- 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.

## **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'330 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
-

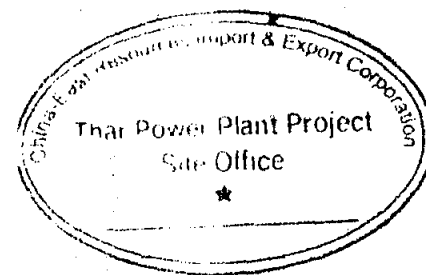
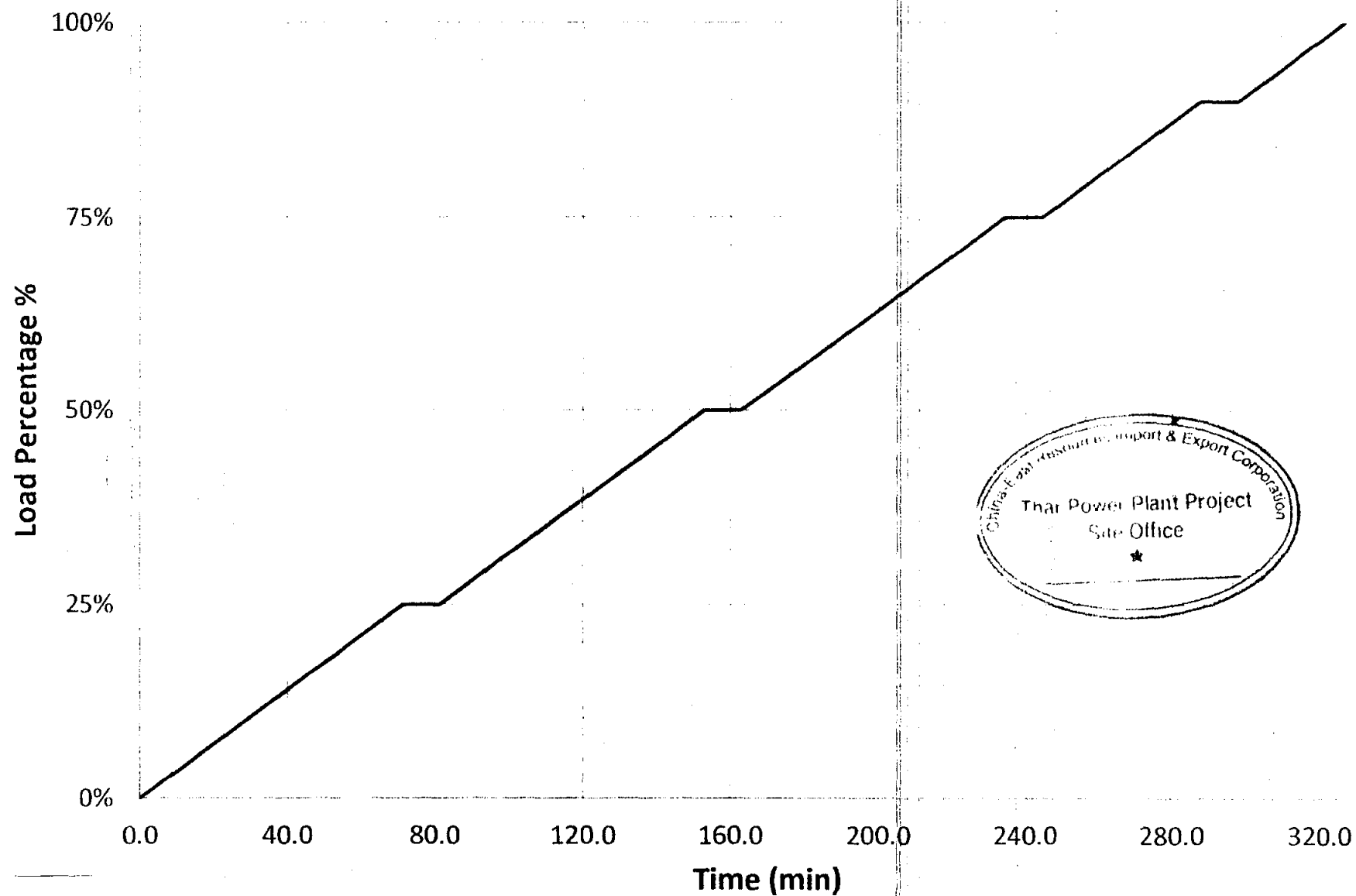
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## **Annexure 1**

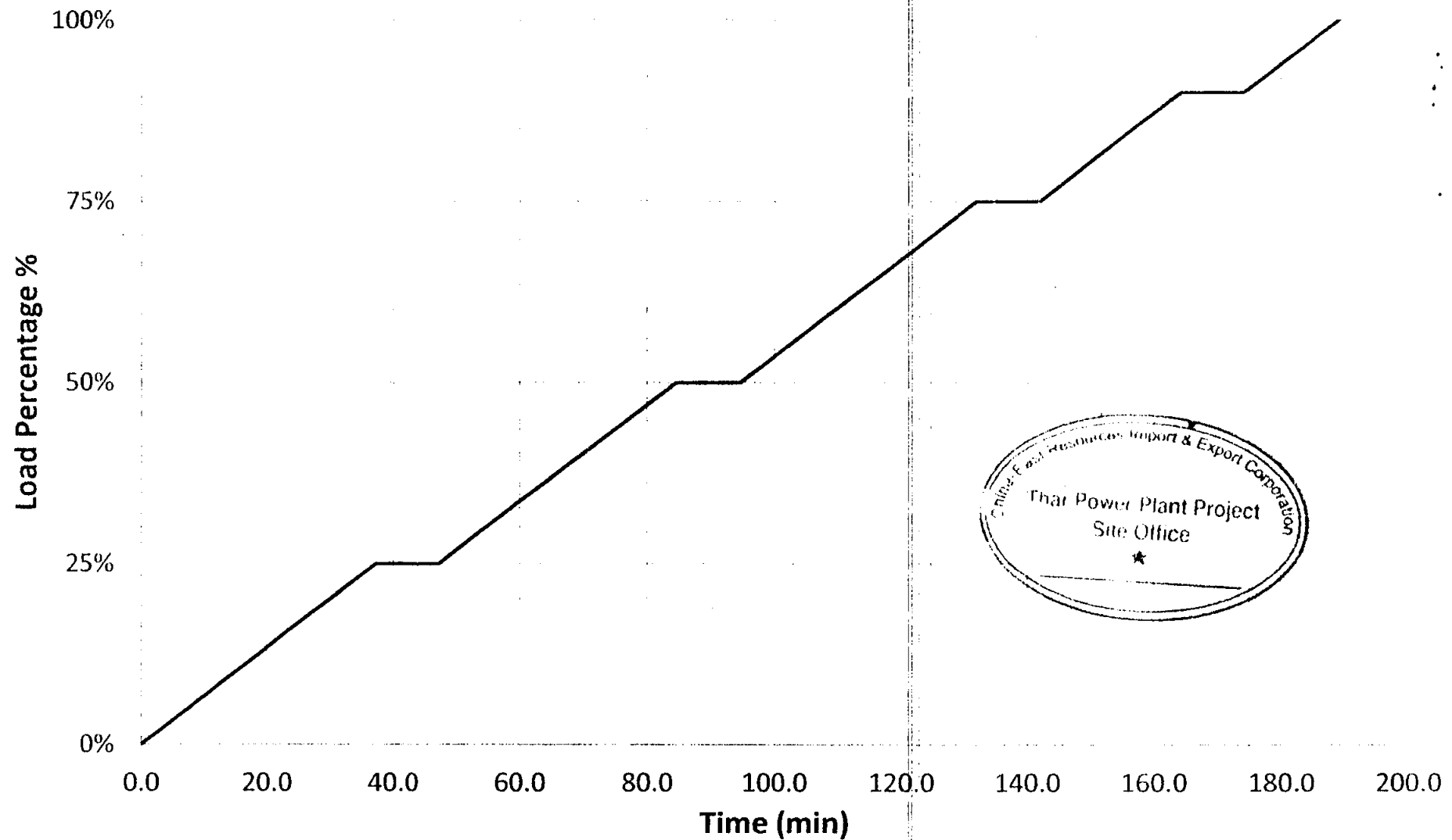
### **Start-up Load Profiles**

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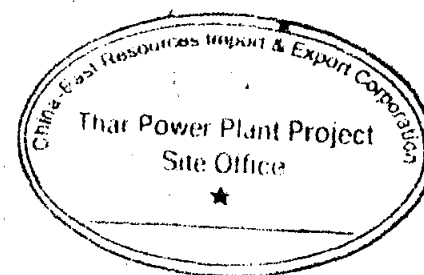
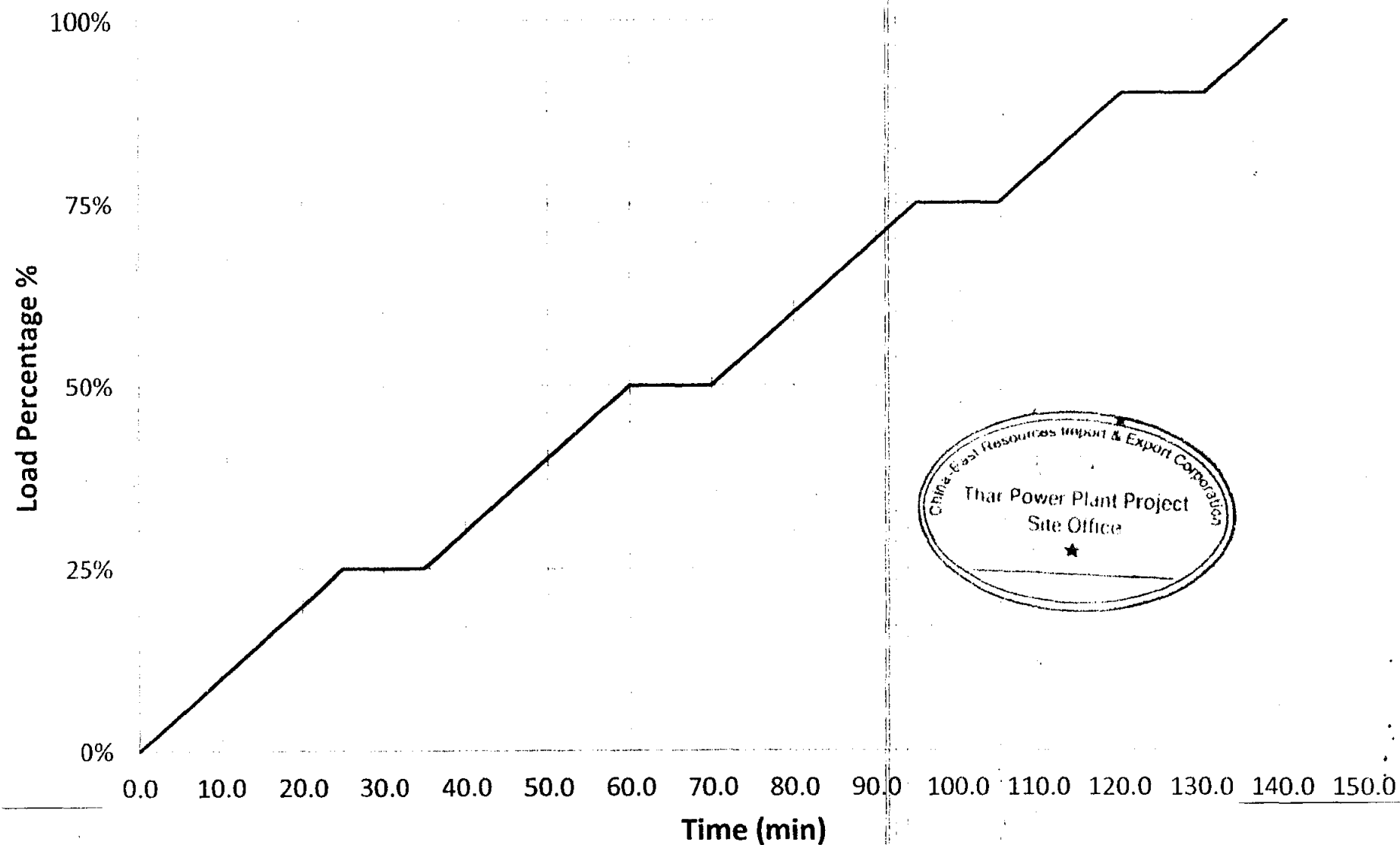
Cold Start-up Load Profile (Synch to Full Load = 326 min)



Warm Start-up Load Profile (Synch to Full Load = 189 min )



Hot Start-up Load Profile (Synch to Full Load = 140 min)





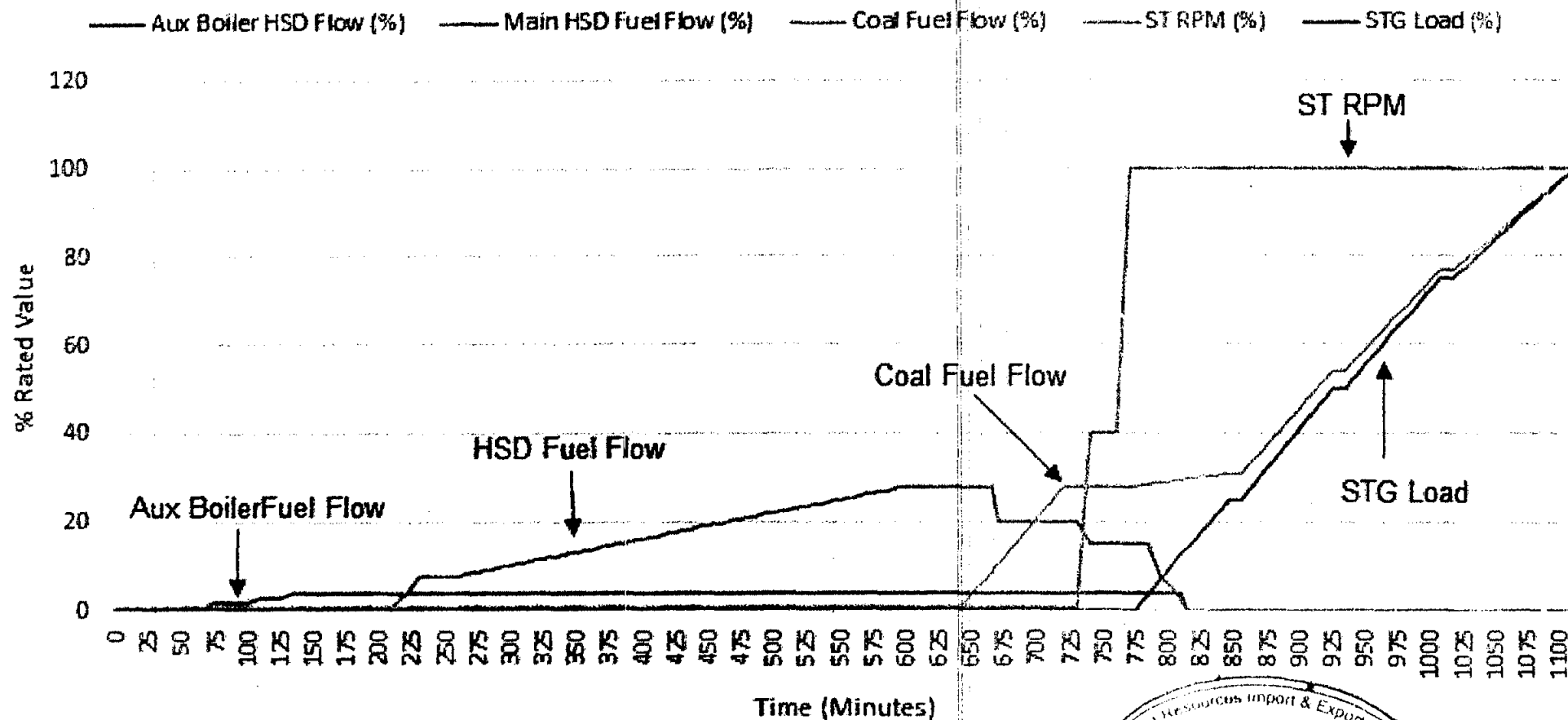
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## Annexure 2

### Start-up Curves

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## TEL 1\*330MW CFPP - Cold Startup Curve after 150 Hours (100% MCR, Performance Coal)

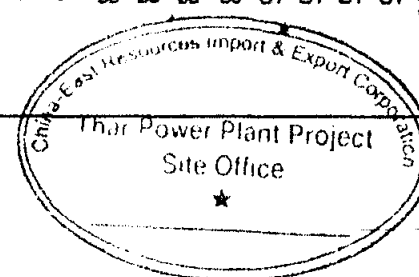


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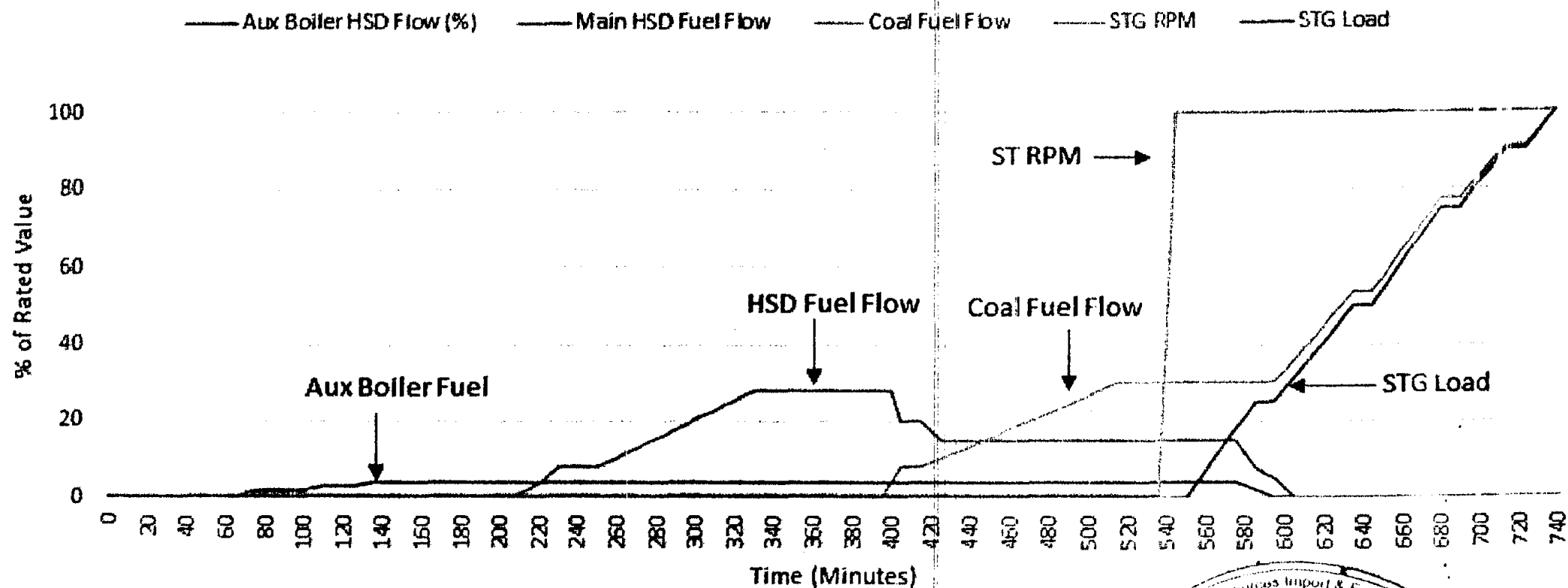
All OEM requirements will be followed.

This graph is only used to inform NTDC the time of unit startup.

The bed inventory should be 10 ~ 12 KPa equivalent before startup.



## TEL 1\*330MW CFPP Warm-2 Startup Curve after 32 hrs & less than 150hrs (100% MCR, Performance Coal)

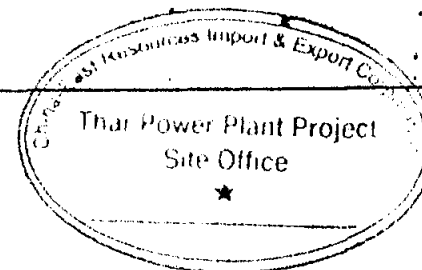


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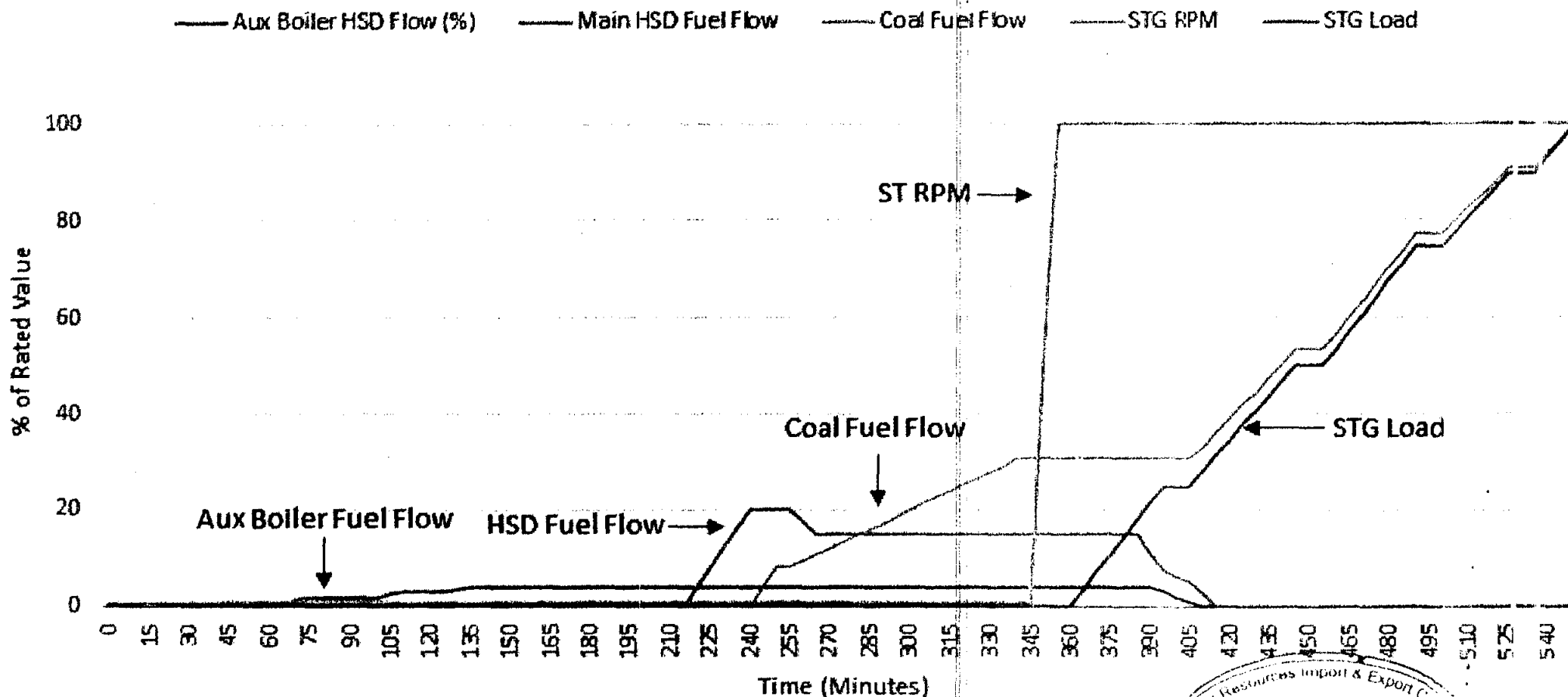
All OEM requirements will be followed.

This graph is only used to inform NTDC the time of unit startup.

The bed inventory should be 10 ~ 12 KPa equivalent before startup.



## TEL 1\*330MW CFPP Warm-1 Startup Curve after 8 hrs & less than 32 hrs (100% MCR, Performance Coal)



**Note:**

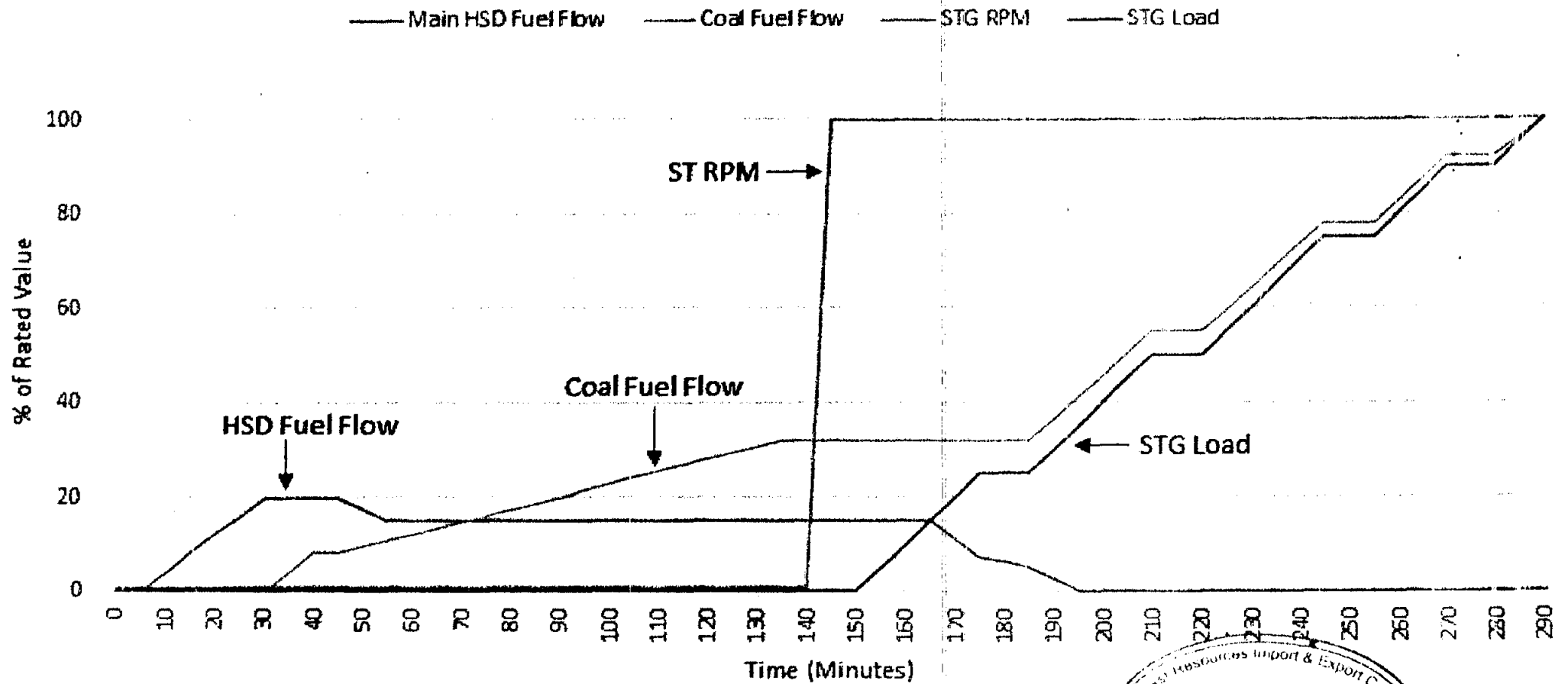
All OEM requirements will be followed.

This graph is only used to inform NTDC the time of unit startup.

The bed inventory should be 10 ~ 12 KPa equivalent before startup.



## TEL 1\*330MW CFPP Hot Startup Curve after 2 hrs & less than 8 hrs (100% MCR, Performance Coal)

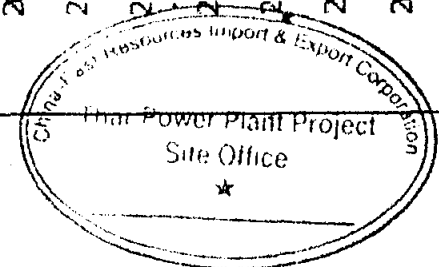


**Note:**

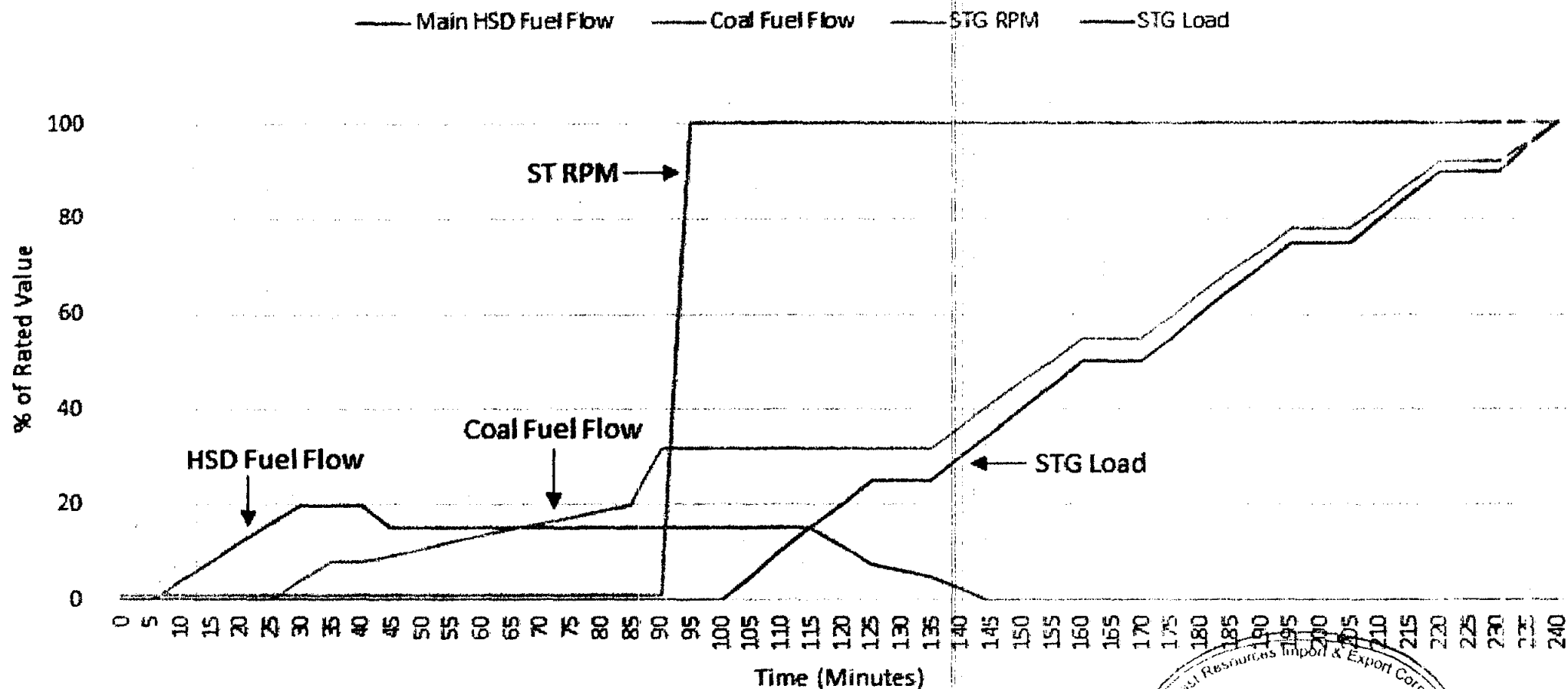
All OEM requirements will be followed.

This graph is only used to inform NTDC the time of unit startup.

The bed inventory should be 10 ~ 12 KPa equivalent before startup.



# TEL 1\*330MW CFPP Very Hot Startup Curve less than 2 hours (100% MCR, Performance Coal)



**Note:**

All OEM requirements will be followed.

This graph is only used to inform NTDC the time of unit startup.

The bed inventory should be 10 ~ 12 KPa equivalent before startup.

