

**BEFORE THE HON'BLE TELANGANA STATE ELECTRICITY
REGULATORY COMMISSION,
AT ITS OFFICE AT V FLOOR, SINGARENI BHAVAN, RED HILLS,
HYDERABAD.**

O.P.NO. 9 OF 2024 (Suo-Moto)

In the matter of: SUO-MOTO DETERMINATION OF COMPLIANCE OF
RENEWABLE POWER PURCHASE OBLIGATION OF
OBLIGATED ENTITIES FOR FY 2022-23.

Objector:

M/s. Nava Limited,
(Formerly Nava Bharat Ventures Limited)

...Objector

Dear Sir,

Sub: Submission of objections on RPPO Compliance status report submitted by the State Agency, TGS LDC to the Hon'ble Commission for the FY 2022-23 in terms of Regulation No 7 of 2022 -Reg.

Ref: 1) Copy of Letter dt.30.03.2023
2) Copy of the RPPO Compliance Return submitted for the FY 2022-23
3) Copy of Notification of Ministry of Power dated 01.10.2019
4) Copy of third-party inspection report of NAVA's WHRS plant.

With reference to the above-mentioned subject, this Hon'ble Commission has issued a Public Notice inviting objections/suggestions/Comments in the matter of RPPO Compliance status report submitted by the State Agency, TGS LDC to the Hon'ble Commission for the FY 2022-23 against the Regulation No.7 of 2022 and directed to submit the objections on or before 27.08.2024 by 05:00 PM.

We have gone through the submission of the Nodal Agency i.e. TGS LDC's Compliance report for the FY 2022-23 and the matter of our Company, NAVA, having HT SC.No.BKM-001, we note that the SLDC has stated the following:

For NAVA LIMITED

Authorised Signatory

1. It had apparently issued final notices to the entities through emails on 04.05.2024.
2. Sl.No.3 of the table titled “*Revised Compliance of RPPO Obligation by CPPs having Waste Heat Recovery*” shows self-consumption of NAVA Ltd (Formerly Nava Bharat Ventures Ltd.) from fossil fuel generator is 4,54,981.9 MWh and open access is 38,292 MWh and total consumption is 4,93,273.9 MWh and thereon RPPO target to be met is 41,928.28 MWh considering 8.5%.
3. NAVA’s WHR consumption is ‘nil’ and Balance RPPO to be fulfilled for the FY 2022-23 is 41,928.28 MWh. The remarks provide by SLDC in relation to our plant states as follows: “*On continuous claim of M/s.NAVA Ltd requesting to consider their plant as WHR based co-generation plant and on directions issued by Hon'ble TSERC to recompute the RPO compliance status, TSSLDC requested TSNPDCL to inspect the plant for its power consumption from WHR. Meanwhile the generator has filed petition vide OP. No. 20 of 2020 claiming for exemption of their plant from RPPO compliance. Hon'ble TSERC on 14.03.2022 order No. 20 of 2020 duly dismissing the petition. Later, on 13.12.2022 TSNPDCL submitted the inspection report that there is no cogeneration plant based on WHR and cannot be considered for claiming exemption from RPO compliance. At present the generator has filed petition at Hon'ble APTEL on the same matter vide DFR No. 39 of 2023 listed for the matter on 18.07.2023.*”

In the above context, we wish to submit that:

1. We have not received any e-mail on 04.05.2024, as alleged by the SLDC.

For NAVA LIMITED

Authorised Signatory

2. Self-consumption of NAVA Ltd (Nava Bharat Ventures Ltd) from its Co-gen Captive power generating plant including power consumed under open access is 4,54,981.9 MWh but not 4,93,273.9 MWh, which the numbers need to be corrected considering the actual details furnished hereunder.
 - a. Captive power consumption from NAVA's CPP (including energy of 38,707 MWh consumed from its WHRS) is 4,16,689.9 MWh.
 - b. Captive power consumption from NAVAs' Odisha CPP under open access is 38292 MWh.
 - c. Thus total (a+b) captive power consumption is 4,54,981.9 MWh.

Further, without prejudice to the other contentions, as per the Notification of Ministry of Power, Govt of India, dated 01.10.2019, (which was also addressed to all SERC's and also under implementation by other SERCs in their respective states), the Captive power generating plants Commissioned before 01.04.2016, the %ge of obligation was pegged to the level as prescribed in the RPPO Regulations for the FY 2015-16 by the respective State Regulatory Commissions. Accordingly, in the state of erstwhile Andhra Pradesh, the RPP Obligation on captive power consumption for the FY 2015-16 was 5% which the same level is continued to be applicable for the future period also (*copy of the MoP Notification enclosed*). Accordingly, the RPP obligation of NAVA for the FY 2022-23 will be 22,749 Mwh instead of 41,928.28 Mwh considering 8.5% as shown by SLDC in their submission, which is to be rectified.

3. During the FY 2022-23, NAVA has consumed 38,707 MWh from its WHRS and accordingly submitted the Compliance report to SLDC vide its letter dated 27th July 2023 (copy enclosed for ready reference). But we noted from the compliance report submitted by SLDC to the Hon'ble Commission that our compliance report was not reflected in the

statement and was still been shown under “balance to fulfil”, is incorrect and requires to be rectified.

4. As per the TGERC RPPO Regulation 7 of 2022, Clause 2(1)(p) “Provided that an obligated entity consuming power in any year to the extent of total RPPO specified under clause 3 hereof from fossil fuel based co-generation power plant shall be exempted from RPPO. In case the consumption of an obligated entity from such co-generation power plant is less than the total RPPO, such obligated entity shall be required to fulfil the RPPO to the extent of shortfall;
5. As per the TSERC RPPO Regulation 7 of 2022, under Clause 2(1)(g), the definition of Co-generation means “ a process which produces two or more forms of Energy (including Electricity)”, i.e., there needs to be more than a single form of energy, apart from electricity. This can also include heat energy or mechanical energy.
6. Regarding the contention of SLDC in the matter of the inspection report submitted by TSNPDCL, it is submitted that an inspection team from SLDC, TSGenco, Transco and TSNPDCL have visited our CPP but have allegedly concluded that there was neither a co-generation power plant nor a power plant exclusively based on waste heat recovery. This alleged report was never communicated or made available to us until much later on 15.03.2023. We had in fact replied to the said report vide letter dated 30.03.2023.

In this context, we wish to draw to the kind attention of the Hon’ble Commission that:

7. In respect of our Waste Heat Recovery System, the hot gases emanated from the Ferro Alloy smelters are captured and are utilized to provide the heat support to the steam being used to generate the power in the CPP. As such this WHRS and heat support help us in conserving the

For NAVA LIMITED

Authorised Signatory

energy for which appropriate cost analysis is done to ascertain the benefit of energy through WHRS. We have thus complied with the exemption requirement against RPPO in accordance with the findings of the Hon'ble Commission on WHRS and also submitted the Compliance report for the FY 2022-23 against the Regulation 7 of 2022. We are therefore surprised to note the findings and conclusion of the inspection team which are hereby denied. Further, for verification of the WHRS, the TGNPDCL and TGTRANSCO officials visited our plant several times earlier too but never objected on existence, process and performance of our WHRS which qualifies Co-generation. There was also never any denial of the existence of our WHRS in the replies filed by the TGSLDC/TGNPDCL before this Hon'ble Commission in O.P.No.20 of 2020. We had also received a third-party inspection report of the WHRS, which is annexed herewith for this Hon'ble Commissions' kind perusal.

8. The TSNPDCL inspection team had visited our plant on 12.10.2022 and during their visit we explained the process of Waste Heat Recovery System from Ferro Alloy Exit flue gases in detail. The team had also visited the site and ascertained the physical arrangement of connectivity of WHRS with both Furnaces and CPP. During the site visit, the operating parameters such as pressure and Temperature of Flue gas and Feed water were checked in local gauges as well as on DCS in CPP main control room and we shared all the relevant documents including Flow Chart, PG Test report of WHRS and Energy Audit report. But the inspection team neither made any reference to these documents nor shared the inspection report to NAVA. As such, the alleged report appears to be made on a pre-determined basis. Further, it was not a joint inspection and we were never party to the alleged report. Therefore, we deny the contentions of the SLDC.

For NAVA LIMITED


Authorised Signatory

9. Considering the above, our CPP with Waste Heat Recovery System (WHRS) qualifies and fulfils the requirement for exemption from RPPO in terms of the Regulations prescribed by this Hon'ble Commission and also S.2 (12) of the Electricity Act 2003, and thus such Co-generation is exempted from RPPO irrespective of the nature of the fuel used. Only in case the consumption of an obligated entity from such co-generation power plant is less than the total RPPO, such obligated entity shall be required to fulfil the RPPO to the extent of shortfall as per the TSERC Regulation 7 of 2022.
10. In the above context, since we are in compliance with the RPPO obligation against Regulation 7 of 2022 through the operation of WHRS for the FY 2022-23, we humbly request the Hon'ble Commission to consider our aforementioned submissions and accordingly declare that we are in full compliance of the RPP Obligations under Regulation No.7 of 2022. We also request this Hon'ble Commission to depute a technical expert of the Hon'ble Commission along with a third-party, if the Hon'ble Commission so deems necessary.

We reserve our right to make further submissions at any stage of the proceedings and to respond by written submissions or otherwise to any oral or written submissions of the SLDC.

We hold ourselves in readiness to provide any other data or clarifications as the Hon'ble Commission might desire in this regard.

Place: Hyderabad
Date: 27.08.2024

For NAVA LIMITED


Authorised Signatory
OBJECTOR

BEFORE THE TELANGANA ELECTRICITY REGULATORY COMMISSION
AT HYDERABAD

O.P. No. 09 of 2024 (Suo-Moto)

Between:

Suo Moto (RPPo) Fy-2022-23 Plaintiff
Petitioner

Versus

M/S. Nava Limited Defendant
Respondent

I/We

M/S Nava Limited

do hereby appoint and retain
CHALLA GUNARANJAN
M. SRIDHAR
DEEPAK CHOWDARY
Advocates

Advocate/s to appear for me/us in the above Suit/Case and to conduct and prosecute and defend the same and proceedings, that may be taken in the respect of any application for execution or any Decree or Order passed therein I/We empower my/our Advocate to appear in all miscellaneous proceedings in the above Suit matter ill all Decree or Orders are fully satisfied or adjusted to compromise and to obtain the return of Documents and draw any moneys that might be payable to me/us the said suit or of matter and notice I/We do further empower my/our Advocate to accept on my/our behalf, service of all or any appeals or petitions filed in any Court of appeal reference or revision with regard to said suit or matter before the disposal of the same in this Hon'ble Court.

For NAVA LIMITED

M
Authorized Signatory

Certified that the executant who is well acquainted with English and this Vakalatnama and the contents of the Vakalatnama were read out and explained in Telugu/Urdu/Hindu to the executant or he/she/they being unacquainted with English who appeared to have perfectly understood the same and signed/put his/her/their name or mark in my presence.

Identified by: M. Sridhar Advocate.

Executed on this the 27 day of August 2024.

S. CHAKRAPAN
ADVOCATE
Advocate
6-3-609/19071, Prasant Avenue,
Adj. to SBI Bank, Anandnagar,
Khairatabad, Hyderabad-500 004.
Cell : 9441219659

BEFORE THE TELANGANA
ELECTRICITY REGULATORY
COMMISSION AT HYDERABAD

O.P. No. 09 of 2024 (Suo-Moto)

Between:

Suo moto (RPPG) Fy 22-23 Petitioner

And

M/S. Neve Ltd. Respondent

VAKALAT

Advocates for: Objector

Filed on: 27/08/2024.

Address for service of the said Advocate/s

CHALLA GUNARANJAN
Flat No.101 | Krishnaveni Pride |
H.No.8-3-833/204 |
Kamalapuri Colony | Hyderabad |
Telangana 500 073



NAVA LIMITED

(Formerly Nava Bharat Ventures Ltd.)

Corp. Office: Silicon House, No. 8-3-318/1, Plot 78,
Road No. 14, Banjara Hills, Hyderabad - 500 034, Telangana, India.

NAVA/FIN/ 625 /2022-23
March 30, 2023

The Chief Engineer, TSSLDC,
Room No.611, TSTRANSCO
Vidyut Soudha, Khairatabad,
Hyderabad-500082

Dear Sir,

Sub: TSSLDC -Compliance of RPPO as per TSERC, RPPO Regulation NO.7
of 2022 dated 01.04.2022 -Reg..

Ref: Your Letter No.CE/SLDC/F.RPPO/DNO.675/22 Dt.14.03.2023
received by us through email on 15.03.2023

--- --- ---

With reference to the above-mentioned subject, vide your letter dated 14.03.2023, we were informed that an inspection team constituting officials of TSGENCO, TS DISCOMS and TSTRANSCO; had inspected our Captive Co-gen power plant and ferro alloy plant at Paloncha, but concluded that there was neither co-generation power plant nor a power plant exclusively based on waste heat recovery. Accordingly it was advised that the captive consumer cannot be considered for any exemption from the RPPO compliance and we were advised to fulfil the RPP Obligation as per TSERC RPPO Regulation 7 of 2022.

In this context, we wish to draw your attention to the applicable Regulations of TSERC as under;

As per the TSERC RPPO Regulation 7 of 2022, Clause 2(1)(p)
"Provided that an obligated entity consuming power in any year to the extent of total RPPO specified under clause 3 hereof from fossil fuel based co-generation power plant shall be exempted from RPPO. In case the consumption of an obligated entity from such co-generation power plant is less than the total RPPO, such obligated entity shall be required to fulfil the RPPO to the extent of shortfall;

As per the TSERC RPPO Regulation 7 of 2022, under Clause 2(1)(g), the definition of Co-generation means "a process which produces two or more forms of Energy (including Electricity)" .

Cont..2

:2:

According to the above definition, Energy means not only Electricity. Energy exists in many different forms like light energy, heat energy, mechanical energy, gravitational energy, electrical energy, sound energy, chemical energy, nuclear or atomic energy and so on..

In respect of our Waste Heat Recovery System, the hot gases emanated from the Ferro Alloy smelters are captured and are utilized to provide the heat support to the steam being used to generate the power in the CPP. As such this WHRS and heat support help us in conserving the energy for which appropriate cost analysis is done to ascertain the benefit of energy through WHRS. We have thus complied with the exemption requirement against RPPO in accordance with the findings of the Hon'ble Commission on WHRS and also submitted the Compliance report against the Regulation 2 of 2018 along with independent Cost Auditor 's certificate from time to time. We are therefore surprised to note the findings and conclusion of the inspection team which are hereby denied. You are also aware that for verification of the WHRS, the TSNPDLC and TSTRANSCO officials visited our plant several times earlier too but never objected on existence, process and performance of our WHRS which qualifies as Co-gen plant.

Recently the inspection team had visited our plant on 12.10.2022 and during their visit we explained the process of Waste Heat Recovery System from Ferro Alloy Exit flue gases in detail. The team had also visited the site and ascertained the physical arrangement of connectivity of WHRS with both Furnaces and CPP. During the site visit, the operating parameters such as pressure and Temperature of Flue gas and Feed water were checked in local gauges as well as on DCS in CPP main control room and we shared all the relevant documents including Flow Chart, PG Test report of WHRS and Energy Audit report.

Considering the above, our CPP with Waste Heat Recovery System (WHRS) qualifies and fulfils the requirement for exemption from RPPO in terms of the Regulations prescribed by the Hon'ble State Commission and also Section 2 (12) of the Electricity Act 2003, and **such Co-generation is exempted from RPPO** irrespective of the nature of the fuel used. Only in case the consumption of an obligated entity from such co-generation power plant is less than the total RPPO, such obligated entity shall be required to fulfil the RPPO to the extent of shortfall as per the TSERC Regulation 7 of 2022.

Contd..3



NAVA LIMITED

(Formerly Nava Bharat Ventures Ltd.)

Corp. Office: Silicon House, No. 8-3-318/1, Plot 78,
Road No. 14, Banjara Hills, Hyderabad - 500 034, Telangana, India.

:3:

In view of the foregoing we would reiterate that the WHRS of our CPP undoubtably qualifies as Co-gen and facilitates exemption from RPPO Compliance under Regulation 7 of 2022 of the Hon'ble State Commission, which may please be considered.

Thanking you,

Yours faithfully,
For NAVA LIMITED
(Formerly Nava Bharat Ventures Limited)

GRK Prasad
Executive Director

Copy to : The Secretary, TSERC, Hyderabad



NAVA LIMITED
(Formerly Nava Bharat Ventures Limited)

NAVA/FIN/ 219/2022-23
July 27, 2023

The Chief Engineer, TSSLDC,
Room No.611, TSTRANSCO
Vidyut Soudha, Khairatabad,
Hyderabad-500082

Dear Sir,

Sub: Submission of RPPO Compliance Report for the FY 2022-23 -Reg

Ref:1 TSERC RPPO Regulation NO.7 of 2022 dated 01.04.2022

Ref:2 our Letter NVA/FIN/625/2022-23 dated 30.03.2023

--- --- ---

With-reference to the above mentioned-subject, please find the enclosed RPPO Compliance report for the FY 2022-23 in regarding to our 114 MW Co-gen Captive Power plant, Paloncha, Telangana.

According to the enclosed statement, considering the consumption from WHRS, RPP obligation stands fully fulfilled for the FY 2022-23.

Thanking you,

Yours faithfully,
For NAVA LIMITED
(Formerly Nava Bharat Ventures Limited)

GRK Prasad
Executive Director

Copy to : The Secretary, TSERC, Hyderabad.

NAVA LIMITED (Formerly Nava Bharat Ventures Limited)
114 MW POWER PLANT - PALONCHA
BHADRADRI -KOTHAGUDEM DISTRICT
TELANGANA STATE

Date: 27.07.2023

RPPO COMPLIANCE REPORT FOR THE FY 2022-23

Self consumption is as per In house meters

FY	HT SC.No	Name of the Consumer	Concerned DISCOM	Source of Purchase			Total Energy Consumption through captive consumption-MWH
				Total Self Consumption - MWH	Consumption from waste heat recovery (WHRs) - MWH	Open access from fossil fuel generator -MWH	
2022-23	BKM-001	Ferro Alloy Plant	NPDCL	4,54,982	38,707	0	4,54,982



No. 30/04/2018-R&R
Government of India
Ministry of Power

Shram Shakti Bhawan, Rafi Marg,
New Delhi, 1st October, 2019

To

1. Chairperson, CEA, Sewa Bhawan, R.K. Puram, New Delhi.
2. Secretary (Energy/Power), All State Govts/UTs.
3. Secretary, CERC/FOR, Chanderlok Building, Janpath, New Delhi.
4. Secretary, All SERCs
5. CMD, All CPSUs under the administrative control of Ministry of Power.
6. President, FICCI, Tansen Marg, New Delhi.
7. President, ASSOCHAM, New Delhi
8. Indian Captive Power Producers Association
9. DG, APP, New Delhi.

Subject: Clarification on Orders related to Renewable Purchase Obligation.


Sir,

I am directed to refer to the Ministry of Power's Order of even number dated 22nd July, 2016 and 14th June, 2018 regarding long term growth trajectory of Renewable Purchase Obligation (RPO) for Solar and Non-solar for the period 2016-19 and 2019-22 respectively.

2. A clarification was issued by Ministry of Power vide letter dated 1st February, 2019 regarding capping of RPO for Captive Power Plants (CPP) (copy enclosed).
3. Based on the concern raised by various stakeholders and after due consultation with MNRE, CEA and CERC it is further clarified that:
 - i) For CPPs commissioned before 1.04.2016, RPO should be at the level as mandated by the appropriate Commission for the year 2015-16. For CPPs commissioned from 1.04.2016 onwards, the RPO level as mandated by the appropriate Commission or Ministry of Power, whichever is higher, for the year of commissioning of the CPP shall be applicable.
 - ii) In case of any augmentation in the capacity, the RPO for augmented capacity shall be the RPO applicable for the year in which the CPP has been augmented.
 - iii) In case, for meeting the RPO obligation, CPP has surplus power than its consumption requirement, such a CPP may sell its surplus power to the DISCOMs under the prevailing arrangements or in the power exchange.
4. This issues with the approval of Hon'ble MoS(I/C) for Power and NRE.

Yours faithfully,

Encl: As above


(D. Chattopadhyay)
Under Secretary to the Govt. of India
Tel: 2373 0265

Copy to: Shri P.C. Maithani, Adviser, MNRE, New Delhi.

No. 30/04/2018-R&R
Government of India
Ministry of Power

Shram Shakti Bhawan, Rafi Marg,
New Delhi, 1st February, 2019

To

1. Chairperson, CEA, Sewa Bhawan, R.K. Puram, New Delhi.
2. Secretary (Energy/Power), All State Govts/UTs.
3. Secretary, CERC/FOR, Chanderlok Building, Janpath, New Delhi.
4. Secretary, All SERCs
5. CMD, All CPSUs under the administrative control of Ministry of Power.
5. President, FICCI, Tansen Marg, New Delhi.
6. President, ASSOCHAM, New Delhi
7. Indian Captive Power Producers Association
8. DG, APP, New Delhi.

Subject: Clarification on Orders related to Renewable Purchase Obligation .

Sir,

I am directed to refer to the Ministry of Power's Order of even number dated 22nd July, 2016 and 14th June, 2018 regarding long term growth trajectory of Renewable Purchase Obligation (RPO) for Solar and Non-solar for the period 2016-19 and 2019-22 respectively.

2. The request of various stakeholders regarding capping of RPO for Captive Power Plants (CPP) has been examined in consultation with Ministry of New and Renewable Energy and it is clarified that RPO of the CPP may be pegged at the RPO level applicable in the year in which the CPP was commissioned. As and when the company adds to the capacity of the CPP, it will have to provide for additional RPO as obligated in the year in which new capacity is commissioned. There should not be an increase in RPO of CPP without any additional fossil fuel capacity being added.

3. This issues with the approval of Hon'ble MoS(I/C) for Power and NRE.

Yours faithfully,



(D. Chattopadhyay)
Under Secretary to the Govt. of India
Tel: 2373 0265

Copy to: Shri P.C. Maithani, Adviser, MNRE, New Delhi.

Confidential

**An Inspection Report on
NAVA LIMITED's WASTE HEAT RECOVERY
COGEN CAPTIVE POWER GENERATING
PLANT, PALONCHA**

Submitted to

NAVA Ltd,

(Formerly Nava Bharat Ventures Ltd)

Paloncha- 507154

Submitted By



SIRI EXERGY & CARBON ADVISORY SERVICES (P) LTD

93A, Janaki Enclave, Saroornagar, Hyderabad – 500035

Phone: 8125128222. Fax: 040-24075323, Mobile: 9866324164

Email: siriexergy@gmail.com, www.siriexergy.com

BACKGROUND

To validate applicability of Waste Heat Recovery / Energy Conservation as per Ministry of Power resolution to meet the Renewable Energy Power Purchase Obligation (RPPO), the data related to Nava Ltd, (formerly Nava Bharat Ventures Ltd - NBVL), Paloncha, Telangana.

Based on Data validation, the Heat recovered from Waste Heat Recovery System (WHRS) from the Ferro Alloys Unit connected to Captive Power Plant (CPP) of 114 MW power plant, the equivalent power generation in MWH, presented in this report.

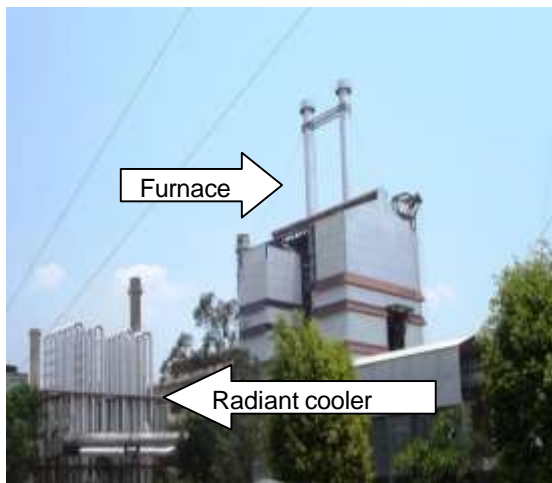
Waste Heat Recovery System at NAVA Ltd:

Nava Ltd, Paloncha, operates 3 thermal power generating units of a total capacity of 114 MW with 2 waste heat recovery systems which generate thermal energy up to 5 MW for captive use from flue gases of submerged electric arc furnaces at its factory premises by utilizing the waste heat with a view to conserve natural resources and reduce Air Pollution. It is submitted that the thermal power units employ steam turbines which extract thermal energy from superheated steam under high pressure. The exhaust steam coming out of Turbine is condensed to water and pumped back to the boiler through a regenerative heating system. Regenerative heating system is designed to heat the feed water (turbine condensate) with the help of steam extracted from the intermediate stages of turbine.

During internal performance reviews and inspection , a potential quantity of thermal energy is identified in the exit flue gas temperatures of submerged electric arc furnaces. About 9 MkCal/hr. is available in this flue gas.. The heat available in the furnace exit flue gas is planned to utilize in the feed water regenerating system of steam turbine, thereby reducing the steam quantity extracted from turbine intermediate stages and the additional steam available is used for power generation.

Therefore, for recovering the waste heat available in the furnace flue gases and thereby utilizing the additional steam for power generation, two heat exchangers are installed in a phased manner as a part of Waste Heat Recovery System (WHRS). The maximum operating temperature of submerged electric arc furnace is 1600°C and the exit flue gas temperature is 380°C & 300°C from furnace - 4 & 3 respectively. The waste heat available in the flue gas is used for heating the power plant's feed water & Main Condensate in WHRS, and thereby cooling the flue gas to 138°C. As a result, the steam extraction at intermediate stages of turbines is coming down and thereby both Waste Heat Recovery Systems are able to produce up to additional 5 MW power.

Layout of furnace before and after installation of WHRS



This is a unique project since no Ferro alloy industry in India is utilizing the waste heat from flue gas of open type Submerged Electric arc furnace and it is conserving natural resources such as coal in a thermal power plant and also reduces thermal pollution. Both the Waste recovery units are capturing thermal energy up to 5 MW power generation.

The WHRS-3 system was installed during the year 2006 and WHRS-4 was installed during the year 2016, with an additional investment of Rs.10 Crores for both the systems.

The following Flow diagrams and photo graphs clearly indicates the WHRS system installation and their location.

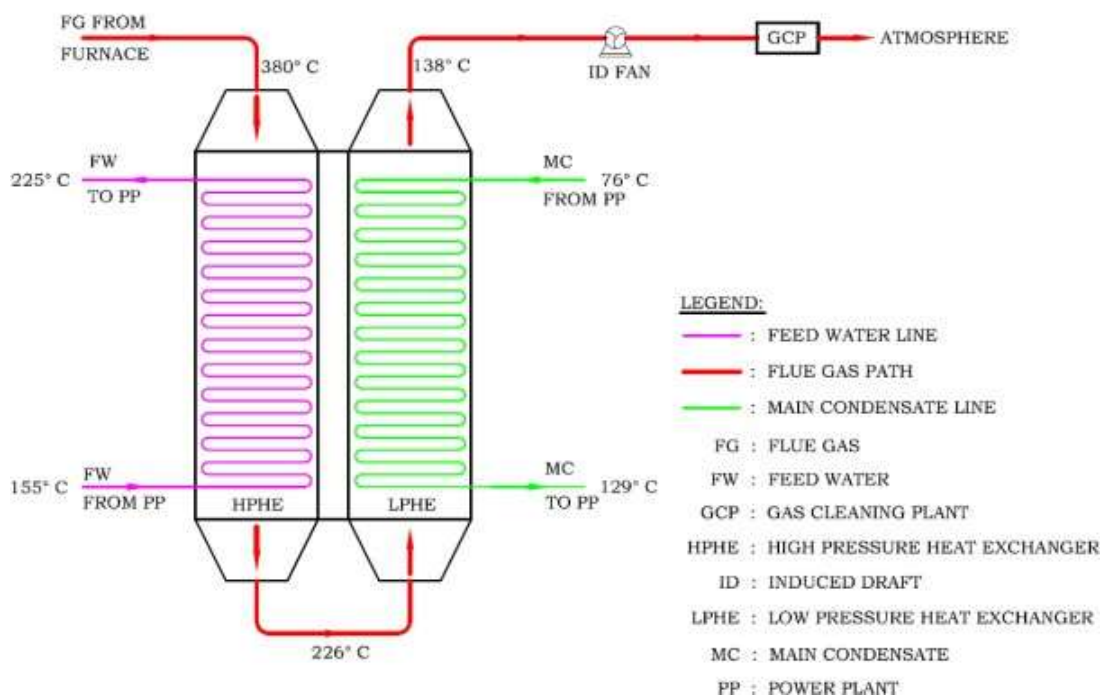


WHR-3



WHR-4

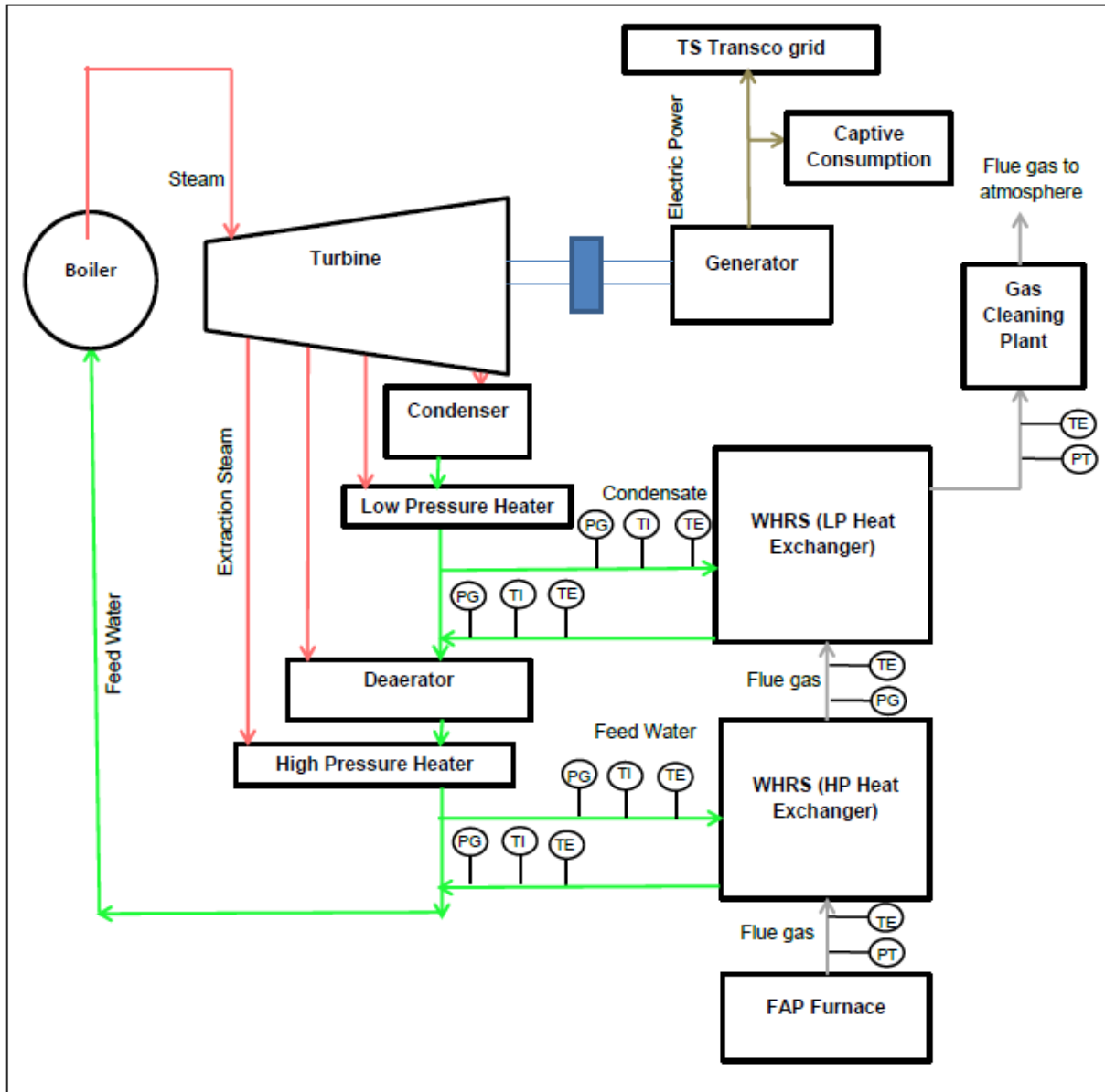
WASTE HEAT RECOVERY SYSTEM (WHR) FLOW DIAGRAM





Nava Limited
114MW CPP, Paloncha

WHRs-3 connected with STG-3 Flow chart

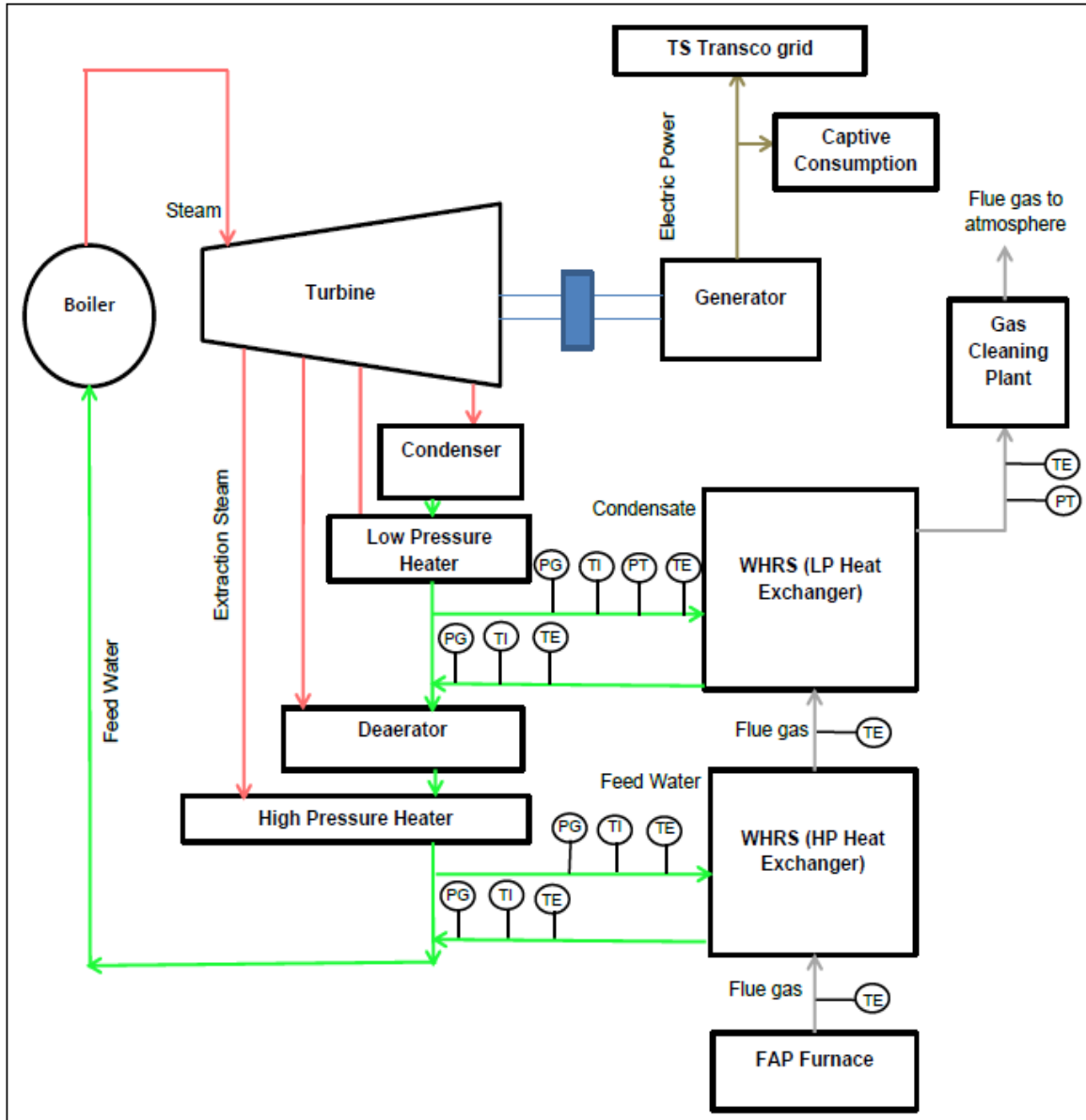


LEGEND:
 PG : Pressure Gauge (Local)
 PT : Pressure Transmitter (DCS)
 TI : Temperature Indicator (Local)
 TE : Temperature Element (DCS)



Nava Limited
114MW CPP, Paloncha

WHRs-4 connected with STG-2 Flow chart



LEGEND:
PG : Pressure Gauge (Local)
PT : Pressure Transmitter (DCS)
TI : Temperature Indicator (Local)
TE : Temperature Element (DCS)

The following tables gives the basis for calculation for Equivalent power Generation for Nava Ltd for two years 2022-23 & 2023-24.

Parameter	2022-23	2023-24
Heat energy available in WHRS-3 as per PG test :	5.076 M.kcal/Nm ³	5.076 M.kcal/Nm ³
Heat energy available in WHRS-4 as per PG test :	8.075 M.kCal/Nm ³	8.075 M.kCal/Nm ³
Avg. GCV of Coal	3,041 kCal/kg	3,538 kCal/kg
Heat Rate of CPP	2,987 kCal/kWh	2,808 kCal/kWh

Based on actual data for the FY 2022-23 & 2023-24, the additional power generated through Waste Heat Recovery Boilers 3 & 4 are as follows:

		2022-23	2023-24
Sl.No	WHR – Boiler Ref.	Eqv. Power MWH	Eqv. Power MWH
1	WHR-3	14,779	9,876
2	WHR-4	23,928	29,669
	Total	38,707	39,545

Thus the enclosed tables and calculations, clearly proves that during the, NAVA Ltd WHRS has generated an equivalent power of 38707 MWH during 2022-23 and 39,545 MWH of power during FY 2023-24.

Nava Limited
 114 MW CPP, Paloncha
 Equivalent power generation in WHRS - 3

Heat energy available in WHRS-3 as per PG test : 5.076 M.kcal/Nm3

Heat energy available in WHRS-4 as per PG test : 8.075 M.kcal/Nm3

Equivalent power generation from WHRS-3: 1.80 MWH

Equivalent power generation from WHRS-4: 2.91 MWH

FY 2022-23

S.No.	Month	WHRs-3	HP Heater				LP Heater				Total Heat Pick up	Heat Rate CPP	Eq.power	Operating Days in month
		Operating time	Feedwater flow	Feed water In	Feedwater Out	Heat Pickup	Feedwater Flow	Feed water In	Feedwater Out	Heat Pickup				
		Hrs.	M3/hr	Temp Deg C	Temp Deg C	M.Kcal/hr	M3/hr	Temp Deg C	Temp Deg C	Kcal/hr	M.Kcal	Kcal/kw	Mwh	
1	Apr-22	713:55:00	109.51	160.00	202.13	4.61	105.51	74.1	119.5	4.79	6770.99	3,003	2,254	30
2	May-22	739:56:00	82.33	158.00	210.53	4.32	78.33	74.6	118	3.40	5746.71	2,957	1,943	31
3	Jun-22	712:50:00	69.75	159.20	209.29	3.49	65.75	73.9	121	3.10	4745.20	2,941	1,613	30
4	Jul-22	728:31:00	65.70	158.00	203.83	3.01	61.70	73.6	121.9	2.98	4457.72	3,129	1,425	31
5	Aug-22	727:05:00	64.80	160.00	202.40	2.75	60.80	73.5	119	2.77	4102.33	3019.88	1,358	31
6	Sep-22	719:32:00	78.30	159.70	206.98	3.70	74.30	73.6	118.5	3.34	5067.76	2971.87	1,705	30
7	Oct-22	730:54:00	66.98	161.20	204.94	2.93	62.98	73.2	118	2.82	4278.93	2929.02	1,461	31
8	Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Dec-22	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Jan-23	734:35:00	28.29	159.20	204.16	1.27	24.29	73.1	119	1.12	802.07	2933.00	273	14
11	Feb-23	633:48:00	64.05	160.00	204.24	2.83	60.05	73.5	117.4	2.64	3675.77	2986.41	1,231	28
12	Mar-23	712:38:00	71.16	162.10	205.70	3.10	67.16	73	117.6	3.00	4536.38	2,996	1,514	31
Total		7153:44:00											14,779	

Nava Limited
 114 MW CPP, Paloncha
 Equivalent power generation in WHRS - 4

Heat energy available in WHRS-3 as per PG test : 5.076 M.kcal/Nm3

Heat energy available in WHRS-4 as per PG test : 8.075 M.kcal/Nm3

Equivalent power generation from WHRS-3: 1.80 MWH

Equivalent power generation from WHRS-4: 2.91 MWH

FY 2022-23

S.No.	Month	WHRs-4	HP Heater				LP Heater				Total Heat Pick up	Heat Rate CPP	Eq.power	Operating Days in month
		Operating time	Feedwater flow	Feed water In	Feedwater Out	Heat Pickup	Feedwater Flow	Feed water In	Feedwater Out	Heat Pickup				
		Hrs.	M3/hr	Temp Deg C	Temp Deg C	M.Kcal/hr	M3/hr	Temp Deg C	Temp Deg C	Kcal/hr	M.Kcal	Kcal/kw	Mwh	
1	Apr-22	716:34:00	104.20	154.00	204.78	5.29	100.20	75	122.9	4.80	7265.56	3,003	2,419	30
2	May-22	649:15:00	94.51	153.00	206.79	5.08	90.51	76	124	4.34	7014.64	2,957	2,372	31
3	Jun-22	700:27:00	95.76	152.60	209.58	5.46	91.76	75.5	123.9	4.44	7125.92	2,941	2,423	30
4	Jul-22	687:20:00	97.73	152.50	208.44	5.47	93.73	74.4	119	4.18	7177.81	3,129	2,294	31
5	Aug-22	699:29:00	99.21	151.00	207.16	5.57	95.21	75.2	124	4.65	7602.03	3,020	2,517	31
6	Sep-22	702:39:00	101.31	149.00	208.71	6.05	97.31	74.4	119.2	4.36	7494.05	2,972	2,522	30
7	Oct-22	705:57:00	106.18	153.00	206.14	5.64	102.18	73.6	123.1	5.06	7960.74	2,929	2,718	31
8	Nov-22	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Dec-22	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Jan-23	715:23:00	88.78	150.50	204.07	4.76	84.78	72.5	122.4	4.23	5823.66	2,933	1,986	27
11	Feb-23	651:54:00	95.95	153.00	209.71	5.44	91.95	74.1	121	4.31	6554.31	2,986	2,195	28
12	Mar-23	741:13:00	95.52	152.00	208.98	5.44	91.52	73.7	123.5	4.56	7440.35	2,996	2,483	31
Total		6970:11:00											23,928	

Nava Limited														
114 MW CPP, Paloncha														
Equivalent power generation in WHRS - 3														
Heat energy available in WHRS-3 as per PG test : 5.076 M.kcal/Nm3														
Heat energy available in WHRS-4 as per PG test : 8.075 M.kcal/Nm3														
Equivalent power generation from WHRS-3: 1.80 MWH														
Equivalent power generation from WHRS-4: 2.91 MWH														
FY 2023-24														
S.No.	Month	WHRs-3	HP Heater				LP Heater				Total Heat Pick up	Heat Rate CPP	Eq.power	Operating Days in month
		Operating time	Feedwater flow	Feed water In	Feedwater Out	Heat Pickup	Feedwater Flow	Feed water In	Feedwater Out	Heat Pickup				
		Hrs.	M3/hr	Temp Deg C	Temp Deg C	M.Kcal/hr	M3/hr	Temp Deg C	Temp Deg C	Kcal/hr	M.Kcal	Kcal/kw	Mwh	
1	Apr-23	710.21	88.69	149.00	210.43	5.45	84.69	73.8	123.8	4.23	6971.09	2,947	2,365	30
2	May-23	731.15	80.09	150.00	209.86	4.79	76.09	74.2	121	3.56	6216.55	2,868	2,168	31
3	Jun-23	717.30	71.69	148.00	202.25	3.89	67.69	74.5	122.9	3.28	5159.15	2,840	1,817	30
4	Jul-23	726.44	63.23	152.00	208.35	3.56	59.23	73.5	122.5	2.90	620.67	2,738	227	4
5	Aug-23	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Sep-23	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Oct-23	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Nov-23	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Dec-23	715.39	122.05	151.50	211.43	7.31	118.05	75	123.5	5.73	2190.67	2,776	789	7
10	Jan-24	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Feb-24	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Mar-24	645.28	104.61	149.50	210.92	6.43	100.61	73	122	4.93	7630.68	3,040	2,510	28
Total		4245.77											9,876	

Nava Limited														
114 MW CPP, Paloncha														
Equivalent power generation in WHRS - 4														
Heat energy available in WHRS-3 as per PG test : 5.076 M.kcal/Nm3														
Heat energy available in WHRS-4 as per PG test : 8.075 M.kcal/Nm3														
Equivalent power generation from WHRS-3: 1.80 MWH														
Equivalent power generation from WHRS-4: 2.91 MWH														
FY 2023-24														
S.No.	Month	WHRs-4	HP Heater				LP Heater				Total Heat Pick up	Heat Rate CPP	Eq.power	Operating Days in month
		Operating time	Feedwater flow	Feed water In	Feedwater Out	Heat Pickup	Feedwater Flow	Feed water In	Feedwater Out	Heat Pickup				
		Hrs.	M3/hr	Temp Deg C	Temp Deg C	M.Kcal/hr	M3/hr	Temp Deg C	Temp Deg C	Kcal/hr	M.Kcal	Kcal/kw	Mwh	
1	Apr-23	692.35	106.92	151.10	204.74	5.74	102.92	73.5	123.1	5.10	7804.81	2,873	2,717	30
2	May-23	715.28	105.06	149.00	209.95	6.40	101.06	74.1	123.2	4.96	8455.65	2,831	2,987	31
3	Jun-23	699.50	98.20	150.20	212.32	6.10	94.20	73	124	4.80	7850.89	2,803	2,801	30
4	Jul-23	742.13	94.25	149.50	212.72	5.96	90.25	74	122	4.33	7656.13	2,738	2,796	31
5	Aug-23	666.51	93.32	149.00	203.87	5.12	89.32	75	122.9	4.28	6993.04	2,723	2,568	31
6	Sep-23	712.40	93.81	148.00	203.72	5.23	89.81	73.5	123.1	4.45	6970.80	2,774	2,513	30
7	Oct-23	708.42	92.11	150.90	203.25	4.82	88.11	73.8	123	4.33	6812.87	2,764	2,465	31
8	Nov-23	683.56	92.45	151.50	203.89	4.84	88.45	73	123.5	4.47	6703.17	2,756	2,432	30
9	Dec-23	741.05	95.64	149.20	215.14	6.31	91.64	73.5	122.8	4.52	8053.07	2,776	2,901	31
10	Jan-24	658.54	94.72	148.50	209.07	5.74	90.72	73	122.9	4.53	7636.74	2,808	2,719	31
11	Feb-24	652.17	95.35	148.50	206.73	5.55	91.35	73.9	122.5	4.44	6954.26	2,771	2,510	29
12	Mar-24	645.52	92.60	148.00	191.13	3.99	88.60	73.5	123	4.39	804.39	3,088	260	4
Total		8317.43											29,669	

Conclusion:

- We certify that the Waste Heat Recovery System (WHRS) is part of Captive Power Plant (CPP) and helping to generate about 39000 MWH / year, thus NAVA LTD CPP qualify as Co-gen plant and as per the Act no RPP Obligation is applicable for such Co-gens. .
- Based on recent CERC guidelines- The definition of renewable energy sources modified as under:

„Renewable Energy Sources“ means renewable sources such as co-generation plants including Waste Heat Recovery System (WHRS) plant irrespective of the type of fuel utilized, mini hydel, small hydro power projects (≤ 25 MW), large hydro power projects include pumped storage projects (> 25 MW) (PSP), municipal waste, industrial waste, biomass, wind, solar including its integration with combined cycle, biofuel co-generation, geo-thermal, tidal and such other sources as recognized or approved by MNRE/MoP;
- Power generated from waste heat shall be allowed to be set off against the RPO requirement of the captive user provided that if the power generated and consumed from such waste heat recovery plant is less than the RPO target, the balance quantity it to be met by purchasing RE power or certificates.
- As per the Regulatory Commission, any consumer consuming electricity from captive co-generation plant or captive co-generation plant using WHR unit beyond its RPPO target for any specific year as per the Regulation No.2 of 2018, shall not be required to purchase additional renewable energy/RECs for that year.
- In case any consumer consuming electricity from captive cogeneration plant or captive co-generation plant using WHR lesser than its RPPO target, the remaining consumption till the RPPO target shall be met through purchase of renewable energy/RECs to meet the RPPO target.
- **This is to certify that NAVA Ltd has generated Equivalent Energy of 38707 MWH of power during 2022-23 & 39545 MWH power through WHRS during the FY 2023-24. To this extent NAVA may be exempted to purchase RPPO.**

Dr G. Subramanyam
 Director
 Siri Exergy & Carbon Advisory Services P Ltd
 Hyderabad
 BEE Accredited Energy Auditor (AEA)
 AEA - 019

SUBRAMANYA
 M
 GANUMUKKALA

Digitally signed by
 SUBRAMANYAM
 GANUMUKKALA
 Date: 2024.08.23
 17:11:44 +05'30'