



सत्यमेव जयते

भारत सरकार

विद्युत मंत्रालय

केंद्रीय विद्युत प्राधिकरण

राष्ट्रीय विद्युत समिति प्रभाग

संख्या: 4/एमडीजीएस/रविस/केविप्र/2021/

दिनांक: 09.06.2022

विषय: एनपीसी की विशेष बैठक के लिए मीटिंग नोटिस और एजेंडा के सम्बन्ध में।

महोदया/महोदय,

उपरोक्त विषय से सम्बन्धित दस्तावेज आपकी जानकारी एवम आवश्यक कार्यवाही हेतु संलग्न है।

संलग्नक : यथोपरि

भवदीय,

*(हस्ताक्षर)*  
10/6/2022  
(ऋषिका शरण)

मुख्य अभियंता एवं सदस्य सचिव, रा. वि. स.

सेवा मे :

1. सदस्य सचिव, उ क्षेत्र वि स, नई दिल्ली -110 016
2. सदस्य सचिव, प क्षेत्र वि स, मुम्बई -400 093
3. सदस्य सचिव, द क्षेत्र वि स, बेंगलुरु-560 009
4. सदस्य सचिव, पु क्षेत्र वि स, कोलकता - 700 033
5. सदस्य सचिव, उ पु क्षेत्र वि स, शिल्लोंग - 793 006

विशेष आमंत्रित:

1. श्री एस आर नरसिम्हन, अध्यक्ष एवं प्रबंध निदेशक, पोसोको, बी-9, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली-110066
2. श्री के. श्रीकांत,, अध्यक्ष एवं प्रबंध निदेशक, पॉवरग्रिड
3. श्री पीसी गर्ग, सीओओ, सीटीयू, सौदामिनी, प्लॉट नंबर 2, सेक्टर-29, गुरुग्राम
4. श्री के.के. प्रभाकर, मुख्य अभियंता, एसएलडीसी, एमपीपीटीसीएल, जबलपुर
5. श्री के.एच. राठौड़, अपर मुख्य अभियंता (परियोजना), एसएलडीसी-गेटको, वडोदरा
6. श्री मनोज टोंक, एसोसिएट वाइस प्रेसिडेंट (एंडोर्स पी एंड एम), अदानी पावर लिमिटेड

प्रति सूचनार्थ:

1. अध्यक्ष, के. वि. प्रा., रा.वि.स.,
2. सदस्य, (ग्रिड प्रचालन एवं वितरण), के.वि.प्रा.

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भारत सरकार/Government of India  
विद्युत मंत्रालय/Ministry of Power  
केन्द्रीय विद्युत प्राधिकरण/Central Electricity Authority  
एन.पी.सी. प्रभाग/National Power Committee Division  
1st Floor, Wing-5, West Block-II, RK Puram, New Delhi-66

No. 4/MTGS/NPC/CEA/2021/

Date: 09<sup>th</sup> June 2022

To

(As per distribution list)

विषय: NPC की Special बैठक के लिए मीटिंग नोटिस और एजेंडा के सम्बन्ध में  
Subject: Meeting Notice and agenda for the Special Meeting of NPC-Reg.

महोदया/महोदय,

एनपीसी की Special बैठक 23.06.2022 को सुबह 11:30 बजे वीडियो कांफ्रेंसिंग के माध्यम से होने वाली है। बैठक का एजेंडा संलग्न है। मीटिंग के एक दिन पहले मीटिंग का वेब लिंक शेयर किया जाएगा।

कृपया बैठक में भाग लेने के लिए सुविधाजनक बनाएं।

The Special meeting of NPC is scheduled to be held on 23.06.2022 at 11:300 AM through video conference. The Agenda of the meeting is attached herewith. The meeting web link will be shared one day before the meeting.

Kindly make it convenient to attend the meeting.

Enclosure: As above

भवदीय/Yours faithfully

  
(ऋषिका शरण/Rishika Sharan)

मुख्य अभियन्ता एवं सदस्य सचिव, रा.वि.स /  
Chief Engineer & Member Secretary, NPC

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### **Distribution List (Members of NPC):**

1. Shri Naresh Bhandari, Member Secretary, NRPC, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016.[ Email: [ms-nrpc@nic.in](mailto:ms-nrpc@nic.in)]
2. Shri Satyanarayan S., Member Secretary, WRPC, Plot No. F-3, MIDC Area, Marol, Opp. SEEPZ, Central Road, Andheri (East), Mumbai-400093. [Email: [ms-wrpc@nic.in](mailto:ms-wrpc@nic.in)]
3. Shri Asit Singh, Member Secretary, SRPC, No.29, Race Course Cross Road, Bengaluru-560009. [Email: [mssrpc-ka@nic.in](mailto:mssrpc-ka@nic.in)]
4. Shri N. S. Mondal, Member Secretary, ERPC, 14, Golf Club Road, ERPC Building, Tollygunje,Kolkata-700 033.[ Email: [mserpc-power@nic.in](mailto:mserpc-power@nic.in)]
5. Shri B. Lyngkhoi, Member Secretary, NERPC, NERPC Complex, Dong Parmaw, Lapalang, Shillong-793006. [Email: [ms-nerpc@gov.in](mailto:ms-nerpc@gov.in) ]

### **Special Invitees:**

1. Shri S R Narasimhan, Chairman & Managing Director, POSOCO, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016.
2. Shri K Sreekant, Chairman & Managing Director, POWERGRID.
3. Shri. P.C Garg, COO, CTU, Saudamini, Plot No.2, Sector-29, Gurugram-122001.
4. Shri K.K. Prabhakar, Chief Engineer, SLDC, MPPTCL, Jabalpur. [Email-[kk.prabhakar@mptransco.nic.in](mailto:kk.prabhakar@mptransco.nic.in)].
5. Shri K.H. Rathod, Additional Chief Engineer (Project), SLDC-GETCO, Vadodara.
6. Shri Manoj Taunk, Associate Vice President (ENDORSE P&M), Adani Power Ltd.

### **Copy for kind information to:**

1. Chairperson, CEA, New Delhi.
2. Member (G&OD), CEA, New Delhi.

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केंद्रीय विद्युत प्राधिकरण  
**Central Electricity Authority**  
राष्ट्रीय विद्युत समिति  
**National Power Committee (NPC)**

**Agenda Notes - Special Meeting of National Power Committee to be held on 23.06.2022**

**1. Introduction**

The special meeting of NPC is to be convened on 23.06.2022 through video conference to discuss the following agenda:

- (i) WRPC agenda for integration of (Interface Energy Meter) IEMs into SCADA/EMS system for telemetry of meter data to MP SLDC,
- (ii) Reviewing the Islanding schemes and
- (iii) Status of RGMO and FGMO in the Interstate/Intrastate Generating stations.
- (iv) Status update of the Sub-Committee/Sub-group constituted under NPC

**2. Integration of (Interface Energy Meters) IEMs into SCADA/EMS system of MP SLDC (Agenda from WRPC)**

- 2.1. WRPC vide letter No. WRPC/Comml/2022/0242 dated 13.01.2022 (**Annexure-I**) informed regarding the proposal of MP SLDC for Integration of (Interface Energy Meters) IEMs into SCADA/EMS system.
- 2.2. As per proposal, the existing SEMs are having two communication ports, which can function independently for fetching the SEM data. The optical port is being used for fetching the weekly DSM data through Common Meter Reading Instrument (CMRI), for accounting purpose. The other RS 232 port available remains unused, the online real time data can be fetched from the existing SEM through the unused RS 232 port. This arrangement does not require additional meters or new communication facilities and therefore no additional cost is involved. MPSLDC's detailed proposal is enclosed along with Annexure I.
- 2.3. The WRPC letter was circulated to all RPCs, CTU, POWERGRID, POSOCO, SLDC-GETCO and Adani Power for their comments. The comments from ERPC, SRPC, CTU, POWERGRID, POSOCO, SLDC-GETCO and Adani Power have been received. The consolidated comments are below:

S.No.	Name of the Organization	Comments on the proposal of MP SLDC
1.	ERPC	1. The redundant RS-232 port of the existing SEM is proposed to be utilized for integration into SCADA through the RTU. Apart from this, RS-232 port is a read only port. The optical port will continue to be used for fetching data for weekly DSM accounting purpose. This seems to be technically feasible and

		<p>without any commercial implication. It may also aid in better operational planning and deviation management in real time grid operation. Hence, implementation of the scheme on pilot basis may be allowed.</p> <p>2. Locations for implementation of the scheme may be finalised after deliberation amongst the concerned parties i.e. MP SLDC, WRLDC, WRPC, CTU &amp; CEA.</p> <p>3. Based on the experience gained from the pilot scheme, implementation of the same on the complete control area of a regional entity may be decided. However, it may also be considered that CEA is already in the process of finalising the technical specification for 5/15 min IEM, AMR and MDP system on Pan India basis for transmitting real time MW data to SLDC SCADA terminals.</p> <p>4. However, the following aspects may be considered before giving a go-ahead for the proposal:</p> <p>a. Cybersecurity aspects may be examined by taking views of IT Division of CEA.</p> <p>b. The data fetched from RS-232 port may be used only for making operational decisions and may not to utilize for raising commercial disputes.</p>
2.	SRPC	<p>1. As there is MODBUS RS232/485 extension units etc. so there are chances of data hanging due to these intermediate electronic equipments.</p> <p>2. Confirmation from different OEMs (L&amp;T, secure etc.) is required whether such port able to transfer the data if meters are integrated with SCADA.</p> <p>3. Cyber security aspects need to be looked into.</p> <p><b>The detailed comments are at <u>Annexure II</u>.</b></p>
3.	CTU	<p>Present IEMs comprise of two ports. The details are-</p> <p>1. Optical port, which is used for downloading weekly meter data through DCD and data is sent to RLDC by respective Gencos/TSPs in whose premises IEMs are installed.</p> <p>2. RS232/RS485, kept as Spare port</p> <p>These two ports can function simultaneously and the RS232/RS485 port is suitable for connection with SCADA/EMS system.</p>

		The proposal of MP SLDC for implementation of pilot project may be decided by CEA accordingly.
4.	POSOCO	<p>1.The success of the pilot depends on the availability of Interface Energy Meter (IEM) data of all the interface meters of MP system on real time basis. It is desired that the availability of spare RS232/RS485 ports in all the RTUs at the interfaces may be checked as well as the feasibility of modifying the RTU database at these locations. Once the feasibility is ascertained, the pilot could be executed using the spare ports and additional communication links from meters to SLDC, MP without affecting the performance of the existing meters after obtaining the consent of the owner of the existing meters.</p> <p>2.Pilot project on selected meter(s) can be done so that even if one set of meters (either main or check/standby) under pilot project is out, others set of standby meters is available for energy accounting and settlement. Once it is ascertained that pilot project is not affecting the performance of IEM, other set of IEM can also be taken simultaneously.</p> <p>3.Data security related issues may be a concern due to transmission of data between different utilities. The compliance to the Cyber security provisions with the relevant orders of Ministry of Power, Government of India, Cyber security guidelines of CEA dated 07th October, 2021 and amendments thereof, CEA Standards as well as CERC Regulations and CERT-In Direction relating to information security practices, procedure, prevention, response and reporting of cyber incidents for Safe and Trusted Internet dated 28.04.2022 has to be ensured by the successful bidder/vendor. FAT/SAT would include Cyber security testing as per aforesaid mentioned guidelines.</p>
4	POWERGRID	<p>1.These substations are having OLD RTUs and it is not feasible to integrate IEMs through old RTU.</p> <p>2.These old RTUs are planned to be replaced with new RTUs, which support IEMs integration. Hence, after replacement of OLD RTUs, integration of all the IEMs are possible using existing infrastructure after suitable modification of configuration of new RTUs.</p> <p>3.However, continuity/availability of SCADA data to RLDC may be adversely affected with increased data traffic. Further, the configuration may get affected during any up gradation/modification done by POWERGRID on its RTU</p>

		<p>during routine O&amp;M resulting in loss of energy data transmission.</p> <p>Detailed Comment is enclosed at <u><b>Annexure III.</b></u></p>
5.	SLDC- GETCO	<p>1.Existing ABT meters are very old, requires confirmation from PGCIL for having RS232 port &amp; RS 485 port with MODBUS are available in all the meters as most of the interface points are owned by PGCIL.</p> <p>2.If RS232 Port &amp; RS 485 port are available, then need to confirm that ports are spare/unused and it's in active mode for fetching Real time data.</p> <p>3.Also request to PGCIL to confirm Spare RS 485/RS232 port availability in existing RTU to communicate with meter over MODBUS protocol. Each of the meter will have different set of memory mapping, hence RTU with different configuration for each type of meters will be required. SCADA &amp; IT/OT network with Interface meters is not advisable with Cyber Security concern as Interface Meters is directly related with Energy accounting.</p> <p>4.Most of the Sub Stations/ RTU's ownership by PGCIL, and data are directly reporting to WRLDC and Gujarat SLDC are getting data through ICCP from WRLDC, indirect reporting may lead to delay in reporting time.</p> <p>5.After receiving confirmation from PGCIL for above point no- 1 to 3 , to ensure latency and accuracy of data , SLDC GETCO suggest to carry out POC on different make of meters (ELSTER,L&amp;T, SECURE etc.) installed at various interface point at Gujarat periphery.</p> <p>As DATA accuracy and latency is the main requirement for taking decision in real time grid operation, after verifying same only further inputs/comments in the matter will be possible.</p>
6.	ADANI POWER	<p>1.The data polled using the RS485 MODBUS protocol, as RS 485 port with MODBUS is available in all the meters. Using MODBUS only instantaneous parameters can only be polled, Block parameters for billing purpose cannot be polled on this port, and block data will continue to communicate over GPRS medium / MRI reading.</p> <p>2.To integrate the MODBUS data, RTU and convertors will be required as additional component. Each of the meter will have different set of memory mapping, hence RTU with different</p>

		<p>configuration for each type of meters will be required.</p> <p>3. Under “Technical Specification (TS) for ISTS Metering System” proposed system advance DCU is proposed which can poll instantaneous parameters and block data on Ethernet port and support DLMS protocol.</p> <p>4. RS 485 and RS 232 are the legacy communication ports over Ethernet communication, which can give instantaneous parameters and block data on same port reliably, since these meters have already completed its useful life, we must immediately migrate to new generation of meters.</p> <p>5. As per the SAMAST- (Scheduling, Accounting, Metering and Settlement of Transactions in electricity) guide lines settlements may possibly migrate to 5-minute, few make of existing meters doesn't support 5 min configuration.</p> <p>6. Through the scheme proposed by MP, we also need to think of meter time sync through RTU mechanism.</p> <p>7. Requirement prepared under “Technical Specification (TS) for ISTS Metering System” in western region has much wider scope and system will be in parallel to the present SCADA system, which is in line with the future metering requirement. However POC carried out by MP is interim arrangement to cater the present mismatch between pool account issued and decision taken based on the SCADA data. If the system gets implemented under (“Technical Specification (TS) for ISTS Metering System”) which will be in the larger interest of all the beneficiaries will cover all the aspects highlighted.</p> <p>8. Requirement prepared under “Technical Specification (TS) for ISTS Metering System” has much wider scope, as compare to this POC, and POC carried out by MP has limited scope to cater their immediate requirement.</p> <p>9. It is not advisable to integrate the substation SCADA to any other IT / OT network, in case we are exploring this route, then network security needs to be ensured.</p>
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2.4. MP SLDC is requested to give a presentation on this proposal to the Members.

**The members may deliberate on the subject issue.**

### **3. Review of Status of Islanding schemes.**

3.1. The 11<sup>th</sup> meeting of NPC was held on 28.02.2022 through video conference in which following decisions were taken regarding Islanding Schemes:

- a. NRPC to expedite the study of newly designed Islanding schemes in association with NRLDC/CPRI/respective state utilities of NR.
- b. RPCs to expedite the implementation of new islanding schemes.
- c. Six monthly review of islanding scheme needs to be carried out regularly especially for Category-I Islanding Schemes. Whenever there is a substantial change in island load or generation, the islanding scheme needs to be reviewed.
- d. RPCs were requested to update the MIS report on monthly basis for further forwarding it to MoP by NPC Division. RPCs were also requested to carry out Inspection/Audit of essential components like UFR/ df/dt relays/ communication systems etc. as per Standard Operating Procedure (SOP).

3.2. The status of the Islanding Schemes (as on 22.04.2022) is given below:-

Region	Total Number of Islanding Schemes	No. of Implemented /In-service IS	No. of IS which are Under Implementation	No. of Newly proposed Islanding Scheme which are under design/Under Implementation	No. of Newly proposed Islanding Scheme which are Implemented/ In-service	No. of IS having SCADA visibility
SR	7	5	1	1	2	7
ER	10	4	4	2	0	5
NR	11	2	2	7	0	4
WR	12	6	1	5	0	0
NER	3	1	1	1	0	3
	43	18	9	16	2	19

3.3. The MIS report as on 22.04.2022 is at **Annexure-IV**.

**RPCs are requested to update the Committee on the following:**

- (i) **Progress made in implementation of new Islanding Scheme.**
- (ii) **Six monthly review of islanding scheme to be carried out regularly especially for Category-I Islanding Schemes.**
- (iii) **Inspection/Audit of essential components of Islanding Schemes like UFR/ df/dt relays/ communication systems etc. as per Standard Operating Procedure (SOP).**
- (iv) **MIS report of Islanding Scheme.**



#### 4. Status of implementation of RGMO and FGMO in the interstate/Intrastate Generating stations of Region

4.1. The relevant regulations of IEGC are given below for reference:

**Quote “**

(i) Regulation 5.2 (f):

All thermal generating units of 200 MW and above and all hydro units of 10 MW and above, which are synchronized with the grid, irrespective of their ownership, shall have their governors in operation at all times in accordance with the following provisions:

**Governor Action**

i) Following Thermal and hydro (except those with upto three hours pondage) generating units shall be operated under restricted governor mode of operation with effect from the date given below:

a) Thermal generating units of 200 MW and above,

1) Software based Electro Hydraulic Governor (EHG) system : 01.08.2010

2) Hardware based EHG system : 01.08.2010

b) Hydro units of 10 MW and above : 01.08.2010.

(ii) First amendment to IEGC, 2010

After clause (iii) of sub-regulation (f) of Regulation 5.2 of Principal Regulations, following provision shall be inserted.

“Provided that if a generating unit cannot be operated under restricted governor mode operation, then it shall be operated in free governor mode operation with manual intervention to operate in the manner required under restricted governor mode operation.

**”Unquote.**

4.2. NPC Secretariat via email dated 30.05.2022 sought the status of implementation of RGMO and FGMO in the regions. The status of RGMO and FGMO received from SRPC, NRPC, NERPC and ERPC is attached at **Annexure V.**

4.3. In place of restricted governor mode of operation (RGMO), the **report of the expert group to review IEGC has suggested free governor mode of operation (FGMO)** for all generating units in the country in order to arrest steady fall in the frequency in the event of a major grid disturbances.

4.4. As informed by POSOCO the onsite testing of primary frequency response of generating units is being carried out in line with provisions of IEGC. The onsite testing is being conducted by the respective agencies at the identified stations in close coordination with RLDCs and NLDC. As on 30<sup>th</sup> May 2022, the status of testing (based on testing agency) is enclosed at **Annexure VI.**

**Members may deliberate on the subject issue.**



**5. Status update of the Sub-Committee/Sub-group constituted under NPC**

The following Sub-Committee/Sub-group were constituted under NPC:

- (i) Sub-Committee on the uniform philosophy of PMU locations, new analytics and requirement of up gradation of Control Centre under URTDSM project.
- (ii) Sub-Committee to study the AUFLS scheme and common approach for df/dt settings
- (iii) Sub-group to finalize a common procedure for Power System Stabilizers (PSS) Tuning.

**WRPC is requested to update the status of the work assigned to above Sub-Committee/Sub-group.**

6. Any other issue with the permission of the chair.

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भारत सरकार  
Government of India  
केंद्रीय विद्युत प्राधिकरण  
Central Electricity Authority  
पश्चिम क्षेत्रीय विद्युत समिति  
Western Regional Power Committee  
एफ-3, एमआयडीसी क्षेत्र, अंधेरी (पूर्व), मुंबई - 400 093  
F-3, MIDC Area, Andheri (East), Mumbai - 4000 93



आई एस ओ : 9001-2015

ISO : 9001-2015

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No: WRPC/Comml./2022/

116

Date: 14 MAR 2022  
28

To,  
Chief Engineer & Member Secretary  
National Power Committee,  
1<sup>st</sup> Floor, Wing-5, West Block-II,  
R.K.Puram, New Delhi - 110066

Sub: **Integration of Interface Energy Meters into SCADA/EMS System - reg.**

Ref: 1) SLDC, MP letter no. 07-05/E&T/126 dated 25.02.2022  
2) WRPC letter no. WRPC/Comml/2022/0242 dated 13.01.2022  
3) Govt. of MP D.O. No. 170/PS/E/PA/21 dated 08.12.2021

Sir,

This has reference to the discussion held in the 41<sup>st</sup> TCC/WRPC meeting (held on 21/23 Feb 2022) regarding the proposal of MP for Integration of Interface Energy Meters into SCADA/EMS system, wherein it was decided that WRPC shall submit detailed scheme of MP SLDC's proposal to CEA for reviewing it.

The relevant extracts of the 41<sup>st</sup> TCC/WRPC meeting is enclosed at Annexure 1.

The details of the proposed scheme received from SLDC MP vide letter under ref-1 is enclosed at Annex 2.

It is therefore requested to arrange a meeting of all the stakeholders with CEA at the earliest so that the pilot project for implementation of the enclosed scheme can be taken up by MP SLDC.

Yours faithfully,

(Satyanarayan S.)  
Member Secretary

Encl: As above

Copy to:

1. Chief Engineer, SLDC, MPPTCL, Block no. 2, Shakti Bhawan, Rampur, Jabalpur 482008

CCM recommended that as it is a prolonged period of wait and it would not be fair with the beneficiaries to keep them waiting for 2-3 years for adjustments. The matter would be put up before the WRPC and NPCIL was requested to take up the matter with their management and inform the decision in the WRPC meeting.

#### **41st TCC/WRPC Discussions**

MS WRPC informed the background position. He requested NPCIL to inform their management decision on the issue as per their commitment in the 85<sup>th</sup> CCM about payment to be made on monthly basis to the beneficiaries of TAPS 1 & 2 for drawl of the auxiliary power.

NPCIL representative agreed to the discussions of 85<sup>th</sup> Commercial sub-Committee and informed that the adjustments will be done as per the decisions taken for KAPS in 33<sup>rd</sup> WRPC Meeting.

MS WRPC recommended that the frequency of the billing will be monthly.

**The TCC/WRP Committee agreed to the same.**

#### **Item no. 4. Installation of new Interface Energy meters, AMR system and meter data processing system**

##### **Agenda Notes Background:**

A) In the 36<sup>th</sup> WRPC meeting, it was decided that POWERGRID shall replace existing meters by New Interface Energy Meters, AMR system and meter data processing system having specifications as approved in 34th WRPC meeting and recover the cost from the entities on one-time basis.

##### **B) Developments:**

- (i) A meeting was convened by CEA inviting all the RPCs, CTU, NLDC and States on 19.11.2020 and it was decided to form a joint committee comprising members from each RPC, CEA, and CTU/Power grid and POSOCO to deliberate and finalize the TS. It was also decided that the state utilities may put additional meters in series with the existing meters at the ISTS locations at their own cost in consultation with CTU (POWERGRID) to analyse and minimize the cost of DSM penalties.
- (ii) The matter was further discussed in the meeting held on 14<sup>th</sup> April 2021 under the chairmanship of Chairperson CEA. In the meeting the roles and responsibilities

were discussed at length, and it was decided that CEA would frame a model specification for AMR & CDS.

**C) 40<sup>th</sup> WRPC meeting discussions:**

*Installation of state meters on CTU system:*

PGCIL have agreed for allowing Gujarat State to put additional meter in series with the existing SEMs in their premises at the States cost for the pilot project and in the CEA joint Committee meeting it was decided to give a go ahead for the pilot project of Gujarat and once the outcome of the pilot project results in saving to the State, then other States may go ahead with this arrangement.

**D) Integration of SEM data with SCADA discussions in 85<sup>th</sup> CCM:**

The matter of integrating the SEM data (used for accounting purpose) to the SCADA system was discussed in the 6<sup>th</sup> SCADA and Communication meeting.

In this meeting, MP SLDC informed that they have successfully integrated the SEM data (220 kV Jabalpur) in their SCADA system and requested that the SEM data of all state interface points may be allowed to be integrated to their SCADA system. It was agreed that the above arrangement is implementable and a trial on few of the standby or check meters be allowed for a limited period to see the performance of this arrangement. The following points may be noted for this arrangement:

- a. The existing SEMs are having two communication ports which can function independently for fetching the SEM data and at present optical port is being used for fetching the weekly DSM data through CMRI, for accounting purpose.
- b. The other RS 232 port available remains unused. Therefore, the online real time data can be fetched from the existing SEM through the unused RS 232 port.
- c. There shall be no effect on the weekly DSM data.
- d. This arrangement does not require additional meters or new communication facilities and therefore no additional cost is involved.

**MP SLDC have submitted a detailed note on the pilot done by them & is enclosed at Annexure 4.**

In the 85<sup>th</sup> CCM, it was informed that the draft specifications for AMR are under finalisation by NPC division of CEA. The draft specification has also been circulated among the AMR



group of the Western region for their final comments and he requested that comments may be sent to WRPC.

As regards to series meter pilot project of GETCO, GETCO representative informed that the administration's approval has been granted to install the series interface meter and the project is in tendering process. Further they have written to PowerGrid for permission to install meters in series. He requested PGCIL to grant permission for the same. He informed that the meters will be installed at all interface points which are about 94.

PowerGrid representative informed that they will revert back as soon as they receive the letter.

SE (Comm) WRPC, regarding the proposal of MP SLDC of integration of SEM meter with the SCADA, informed that the possibility of such integration was discussed in the 6<sup>th</sup> SCADA committee meeting. Since the existing in-service SEM meter specifications support communication through Optical and RS-232/ 485 simultaneously and the RS-232/485 port is read only port, data can be fetched from this port through RTU by implementing appropriate communication interface protocol (DMLS) at RTUs.

WRLDC representative informed that the POSOCO has replied to Ministry of Power on the same issue in December 2021 and there was a meeting also in CEA in November 2020 on the same issue. POSOCO has raised issues regarding data security, commercial accounting being affected due to such connection.

SE (Comm) WRPC informed a pilot project may be allowed on the standby and check meter for 4-5 meters initially which can be monitored for 2-3 months. The scope of the integration and the advantages of the project will then be reviewed and a call for further integration may be taken up after ascertaining that there is no data security threat, and the commercial accounting is not affected. So initially there is a need to identify the standby and check meters for the pilot project.

MP SLDC representative informed that the arrangement has been tried at three locations i.e., Indore, Bhopal, and Jabalpur. Further the RS 232 is a read only port and there will be no issue regarding the data security of the commercial data. The stations are of MPPTCL and there has been no identified time delay issue. Further there has been no issue regarding downloading of data from the meter as well. The arrangement has been done on Secure make meters.

WRLDC representative informed that these meters are very old, and it is very difficult to identify any errors if they occur in the metering data and hence RLDC should not be held responsible for this. Further WRLDC was of the opinion that if the main meter has error in the data and if such error has to be checked then how the veracity of data from the check and standby meter will be verified. Also, if the meters have to be installed on the PowerGrid stations, the same may be discussed with PowerGrid as well. Also, during the full-fledged project, there might be no standby or check meters on the line and the meters on the other end of the line may not be of the MP system, then how will the modalities of the project be finalised. If there is any issue in data accounting, it shall be the responsibility of MP.

SE (Comm1), WRPC informed that the performance of the project will be checked for a sufficient duration like 2-3 months and then decide the scope of further project. Also, there are no issues presently with the specifications of the meters & its integration and hence they should be allowed to implement the pilot project.

CTUIL representative informed that CEA is working on a draft report for the specifications of the AMR system. However, this scheme will be more preferred, since there is no additional expenditure and the data can be acquired from existing SEM meters through the suggested arrangement, if found successful. He further opined that utilization of facilities and resources should be encouraged.

Member Secretary, WRPC opined that this project can be implemented without any additional communication equipment requirement and the data will be available with the MP so that they can compare with the weekly accounts and will help the SLDC. Further other States might also want to join in the project after the advantages of the project are established after trial period. Also, this proposal is different from the AMR proposal. He informed that the State government of Madhya Pradesh had written to Secretary (Power), MoP. Further the main meter accounting is not getting affected at all and the project is for the benefit of the State dispatcher for minimizing the DSM penalties, as the SCADA data can be less reliable. The concerns of the WRLDC will be taken care of since no changes can be made through the RS 232 port.

SE (Comm1), WRPC requested MP SLDC to identify highly loaded interface points having standby and check meters preferably at 2-3 substations. This would be discussed amongst WRLDC, MP SLDC, PGCIL and WRPC for taking a call on the same.

#### **41st TCC Discussions**

MS, WRPC informed the above background position. He informed that there are three aspects to this agenda item which are

- a. New Energy interface meter, AMR system which was discussed in 36<sup>th</sup> WRPC meeting and NPC, CEA is finalizing the draft specifications of the AMR system and the draft specifications have provision of transmitting MW real time data to the SLDC SCADA terminals.
- b. The second aspect is of Gujarat's proposal, which has already put its own meters in premises to get the SEM data at some ISTS points and extension of the same throughout the interface points of Gujarat State is under way as per the decisions of 39<sup>th</sup> WRPC meeting.
- c. The third aspect is new proposal received from MP, in which MP has requested to allow integration of the existing Interface meter data through the RS 232 Port in their State SCADA System. In Commercial sub-Committee meeting it was suggested that MP may implement the pilot on Interface standby and check meters.

He stated that the constituents are trying to acquire the interface point SEM data so that the SCADA errors and therefore huge DSM penalties are minimised, till the AMR data comes online to States.

AP Gangadharan, ED, PGCIL representative informed that Joint Committee on metering of CEA took the decision of not allowing the existing Interface meter infrastructure for the online data streaming to SLDCs. It had approved the pilot project of Gujarat for allowing installation of additional SEM meter in series with the interface SEMs. If changes are required in already approved proposal of GETCO, the same forum should be approached to take the decision for allowing MP's proposal to go ahead. He also informed that the original proposal of Gujarat was also based on using the existing infrastructure of meter but with reservations expressed against using of existing system, Gujarat modified their proposal and proposed to allow installation of additional meter in series with the Interface SEMs. He also informed that only L&T meters are able to securely transfer the data, other meters have been problematic in the AMR project of NR & ER. He also wanted to know which meter make, MP is planning to take up in their pilot project.

Shri Prabhakar CE, SLDC MP informed that there will be additional cost if additional meter is to be used in series with the existing interface metering system. He informed that the data will be taken from only read only Port of the meter. Installing additional meters will lead



to issues of accuracy between the two and the problem will be solved only if the data is taken from the same meter instead of an additional meter. There will also be issues of update time of data in the meters and if accuracy class of additional meter is not same as interface SEM, then the issue of errors and huge DSM penalties to the DISCOMs will remain unresolved. He also informed that there is no violation of regulation and efforts should be made to strengthen the DISCOMs financially as they are the earning members of the system. He informed that the testing has been done for the Secure meters and there has been no interruptions observed. SE Comm1. WRPC informed that Joint committee of CEA did not deliberate on the usage of existing meters for online data streaming to SLDCs and only the proposal of (installation of additional energy meter in series with the interface) of Gujarat was discussed. The MP's proposal was not discussed in the Joint Committee on AMR system of CEA. Also, the RS-232 port can be utilised simultaneously along with the optical port and the data can be fetched from both simultaneously without any problems. In the 85<sup>th</sup> CCM due care was taken in deciding the meters on which this arrangement can be made on pilot basis and keep it under observation for 1-2 months. It was decided that this arrangement shall be implemented on selected check and standby interface meters so that the main meters are always available for DSM data acquisition. There will be no disturbance to the SCADA data or even the accounting data and the same has been confirmed with the meter manufacturers also. The MP proposal was deliberated in the SCADA committee meeting as well as OCC and it was agreed that a pilot project should be done. Further once it is ascertained that there are no technical issues and interference with the DSM data flow, the same pilot project can be taken up further. If any issue regarding DSM data flow is observed in this arrangement, the pilot can be stopped. The findings and the feedback of the pilot will be communicated with the CEA and the final decision regarding the using of existing meter infrastructure will be taken based on the decision of the CEA forum. He also informed that the Project of Gujarat is also a pilot project and if any one arrangement out of Gujarat or MP provides benefits, then the same should be allowed to go through. Further, Elster make meters in WR which are prone to communication issues have been proposed for replacement and there is a separate agenda item for this meeting.

MSLDC representative was also of the opinion that the MP proposal should be allowed as the DISCOMs are already facing huge financial issues and the proposal is a step in the right direction and ensures that the financial stress is mitigation. He also informed that if different meters are used, the data is always different and hence the same meter should be used.

MS, WRPC informed that with electricity being a concurrent subject, both States and Centre have to solve their problems. If any proposal is coming which will help the power sector and the DISCOMs, the same must be given an opportunity to be done on pilot basis. The above issue has been discussed in several meetings and it has been found to be technically feasible. If there any technical issues, the same should be informed in the forum or else the pilot project should be given a go ahead. RPC forum will finally decide on the decision regarding the same. He suggested that the pilot project may be implemented and the reservations of PGCIL may be informed to the RPC meeting and a decision can be taken up.

#### **41st WRPC Discussions**

MS(WRPC) informed the above agenda position, and the discussions took place in the TCC meeting. He requested PGCIL to elaborate their stand on the matter.

Smt. Seema Gupta, Director (O) PGCIL informed that GETCO proposal was discussed in the meeting with CEA and the same was approved. She further informed that the implications regarding the Cyber Security aspects of the meters of the MP proposal cannot be ascertained. She recommended that this matter should be referred to CEA and a meeting can be called between PGCIL, POSOCO, MP and other concerned entities and the same can be deliberated and a final decision can be taken on the matter. She further informed that they do not have any objection to the proposal and the same can be discussed in detail and approval from CEA should be obtained.

Shri Prabhakar CE SLDC MP informed that the Cyber Security issue will not come in this arrangement, as the data is not exposed to any other entities/device and the same is being taken through the secured SCADA network. Further the data is being pushed in the Channel of RTU which is already secure. Also, there is no connectivity with internet so Cyber Security aspects should not come. Further he requested that if WRPC allows for the pilot project, the same can be taken up in one-two days on the substations of the MPPTCL. He also informed that this arrangement has already been tested on the State meters and it is operating without any issues. He requested that the same has been apprised to the WRPC through the SCADA meetings.

Shri Rajiv Keshkar Dir. (Comml) MPPMCL enquired whether WRPC is not a forum to give approval to such Pilot Project. He also informed that even though the project of Gujarat is going on for last two years, there have been no tangible results and the DISCOMs are suffering due to erroneous SCADA data. Further taking the issue to CEA will again delay the





**MADHYA PRADESH POWER TRANSMISSION COMPANY LIMITED**

**STATE LOAD DESPATCH CENTRE, NAYAGAON, RAMPUR, JABALPUR**

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Corporate office: Madhya Pradesh Power Transmission Co. Ltd., Block No.2, Shakti Bhawan,  
Rampur, Jabalpur 482008, CIN-U40109MP2001SGC014880, Email-mdtransco.nic.co.in



No.07-05/E&T/126

Jabalpur dtd:25.02.2022

To,

**The Member Secretary  
Western Regional Power Committee  
F-3, MIDC Area Marol  
Andheri (East), Mumbai-400093.**

Sub: Integration of Interface Energy Meters into SCADA/EMS System.

...

Sir,

Integration of Interface Energy Meters into SCADA/EMS System had been discussed at length in the 41<sup>st</sup> meeting of TCC / WRPC. It was decided in the meeting that MP SLDC or WRPC shall submit detailed scheme to the CEA for reviewing the scheme and CEA may be requested to convene a meeting of all the stakeholders to take decision on implementation of the scheme of MP SLDC for Integration of Interface Energy Meters into SCADA/EMS System.

The detailed report prepared MP SLDC is enclosed with this letter. WRPC is requested to arrange a meeting of all the stakeholders with CEA at the earliest possible date.

Thanking you,

Encl: as above.

Yours faithfully,

  
**Chief Engineer,  
SLDC, MPPTCL, Jabalpur.**

Copy to –

1. The Director (Technical), M.P. Power Transmission Co. Ltd., Jabalpur.
2. P.A. to Managing Director, M.P. Power Transmission Co. Ltd., Jabalpur.

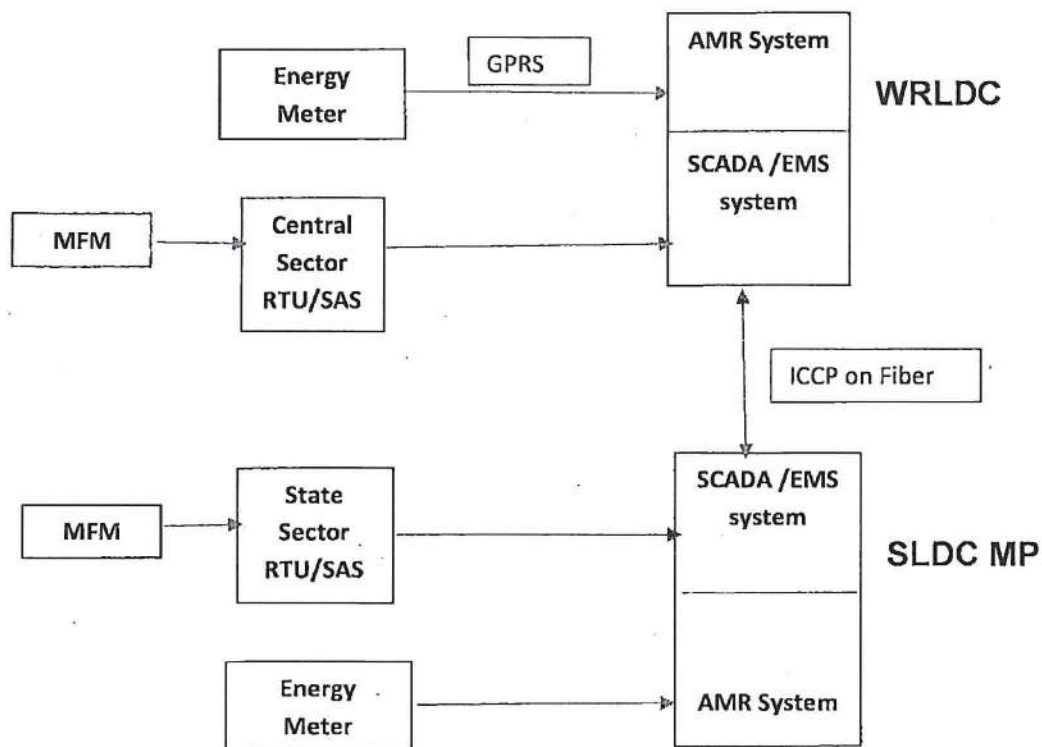
...

## REPORT ON INTEGRATION OF ENERGY METERS INTO SCADA/EMS SYSTEM

It has been observed that there is difference between the DSM charges computed from the real time SCADA values and DSM account prepared by WRPC from the data of interface meters. In order to minimise the difference, it is necessary to provide the data of interface points from same source i.e. from interface energy meters.

The present arrangement of acquiring data in SCADA/EMS system as well as data in AMR based energy accounting system is detailed hereunder: -

### ***(A) Existing Arrangement of Energy Meter and RTU Communication: -***



The drawl of MP from central sector is calculated by algebraic sum of energy drawn at approx. 85 No interface points between STU and ISTS, located at around 35 No. locations. In SCADA/EMS system, the real time data of active power is acquired and the same is utilised for working out average values for the 15-minute time block. The MP schedule is received in SCADA through WRLDC and deviation for the 15 minute time block is calculated accordingly. In Energy Accounting System, for working out deviation, the block wise implemented schedule of MP is received through WRLDC Portal and drawl data of the interface points is downloaded at AMR system of WRLDC.

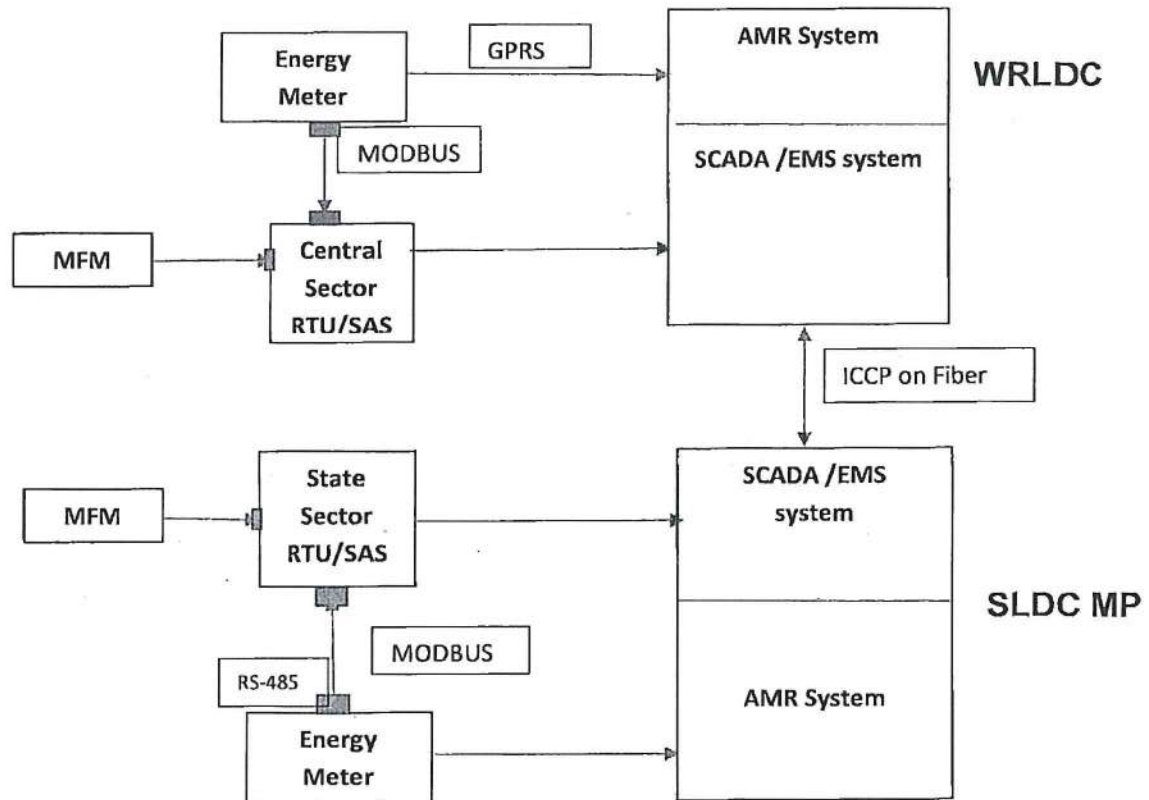
The difference in the deviation values calculated through SCADA/EMS system and the energy accounting system is observed due to following reasons: -

- (i) Different source of data (MFM & Energy meter) in two systems.
- (ii) Long data Channel ( The data at SLDC is received through WRLDC , for eg. PGCIL Jabalpur 400 KV S/s data which is adjoining to SLDC is first goes to WRLDC and then received to SLDC through WRLDC )
- (iii) The long data channel and multiple system involvement ( SLDC & WRLDC SCADA) results in outage of communication channel in SCADA system while in AMR effect of communication system outage is not there as AMR data is downloaded periodically whenever communication channel is available.

In order to eliminate the difference between two systems, the same source of data through shortest possible route in SCADA system is essential. Accordingly, SLDC MP has taken up the task of integration of Interface energy meters with RTUs for providing real time visibility of Interface meter data into SCADA.

### (B) PROPOSED SCHEME OF INTEGRATION OF ENRGY METERS INTO SCADA

In order to eliminate the difference between deviation worked out by SCADA/EMS and Energy Accounting System, MP SLDC has developed a scheme for integration of interface energy meters into RTU/SAS system using spare RS432/485 port of energy meters, as detailed hereunder:-



The in-house scheme developed for integration of Interface meters with RTUs using RS 485 port through MODBUS Protocol has been successfully tested at following locations:-

- (i) 220 KV Jabalpur S/s
- (ii) 132 KV Indore Chambal S/s
- (iii) 132 KV Ayodhya Nagar S/s



- ❖ This scheme of integration has been tested for the various models of Secure make energy meters with M/s Dongfeng make RTUs. However, any interface Energy meter with RTU/SAS may be integrated subjected to availability of spare RS232/485 port and support for MODBUS Protocol.
- ❖ At Jabalpur 220 KV S/s, simultaneously communication of 2 energy meter through single port of RTU has also been tested successfully.
- ❖ The above arrangement is functioning successfully without problem in any of the two systems, since last three months.

### **(C.) ADVANTAGE OF SCHEME:-**

The advantage of this scheme as observed during last three months and the task of integration of RTU with Energy meter, are as given hereunder: -

- ❖ This scheme for providing real time data of Interface meters to SLDC does not involve any additional equipment as data acquired using spare RS232/485 port which is already available in energy meters and not utilised presently.
- ❖ The data acquired in RTU/SAS s through RS232/485 port, which is read only and will not affect the functioning of data on other ports i.e AMR system data.
- ❖ The interface energy meter integration with RTU/SAS is cyber secured as it is based on MODBUS protocol through RS-232/485 port. The MODBUS protocol is based on serial communication with devices in Master & Slave mode. In this case RTU/SAS will act as master and meter will communicate with master only on request of RTU/SAS.
- ❖ The scheme will provide data into SCADA system in real time i.e. data update rate from energy meter to RTU is within one seconds. The data update rate through RTU depends on the communication channel and is in the range of 5-10 seconds (similar to rate of present system of acquiring data through MFM).



- ❖ The time stamping of data is done at RTU level and only for digital data. Real time data acquired in SCADA system will not be affected even when energy meter is having time drift /time stamping/GPS issue in energy meter.
- ❖ It is tested that the data update rate of energy meter data through RTU is not affected even during downloading of energy meter data through AMR system.
- ❖ Presently SLDC MPPTCL has tested the integration with RTU as Substation Automation System (SAS) system is not available in state network. However, integration of meter with SAS system is easily possible either through MODBUS available in BCU or through gateway of SAS system.

**(D.)Proposal for pilot project using standby/check meters :-**

Presently, the scheme is tested on internal energy meters of MPPTCL and before deploying the scheme at all interface points, it is proposed to carry out a pilot project for integration of energy meters installed at ISTS interface points having standby/check meters. For pilot project, SLDC MP has identified the standby energy meters installed at the MPPTCL Sub stations detailed hereunder: - .

Name of Substation	Feeder / Interface meter
400 KV Bhopal	400 KV Itarsi Ckt-1 & 2
	400 KV BDTCL Ckt-1 & 2
400 KV Pithampur	400 KV Indore PG Ckt-1
	400 KV Indore PG Ckt-2

On implementing this scheme at all the interface points of STU with ISTS, real time data of interface meters can also be available in SCADA and will ensure better management of drawl of State from the Regional Grid.

(E.) The testing/integration methodology is also attached herewith as annexure-II.

\*\*\*\*\*

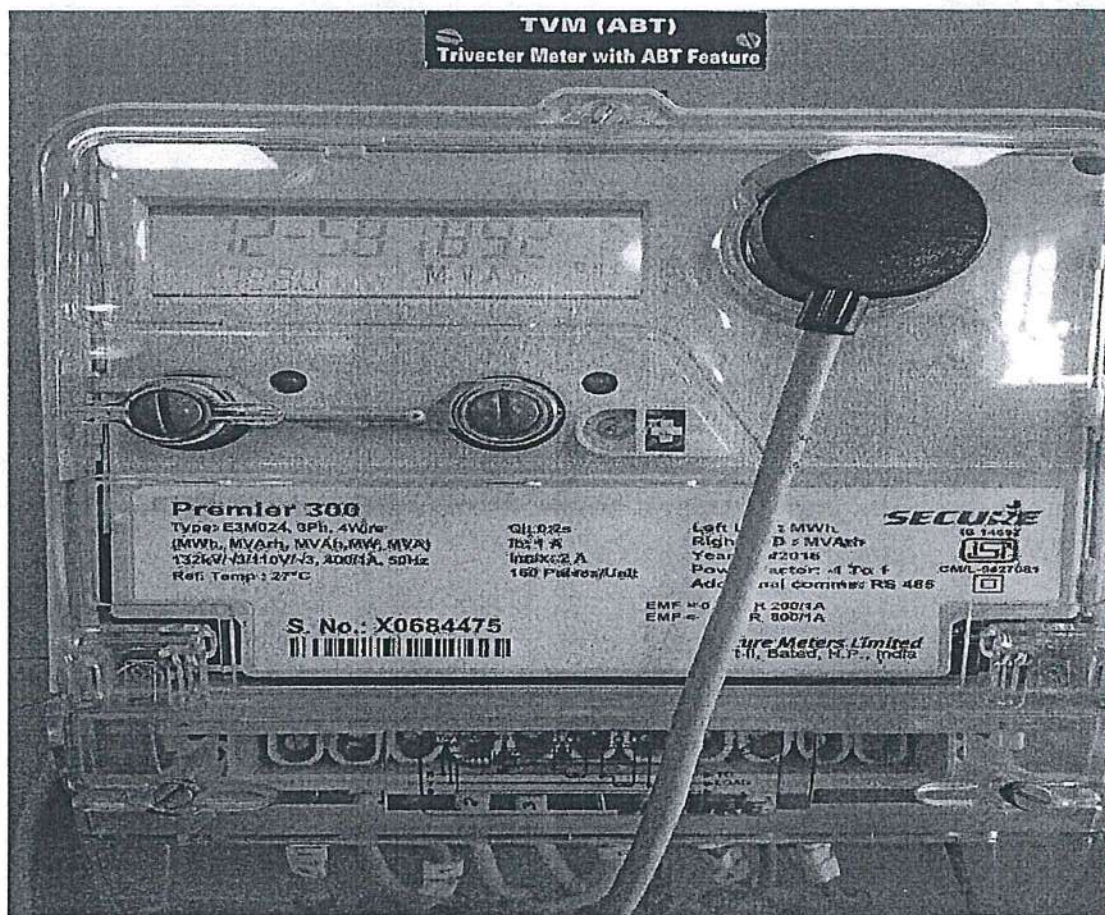
## Annexure-II

### THE TESTING AND INTEGRATION METHODOLOGY

The energy meter of 132/33 KV transformer has been integrated with RTU..  
The equipment's details and testing procedure is detailed hereunder :-

(a) Details at Meter Side :-

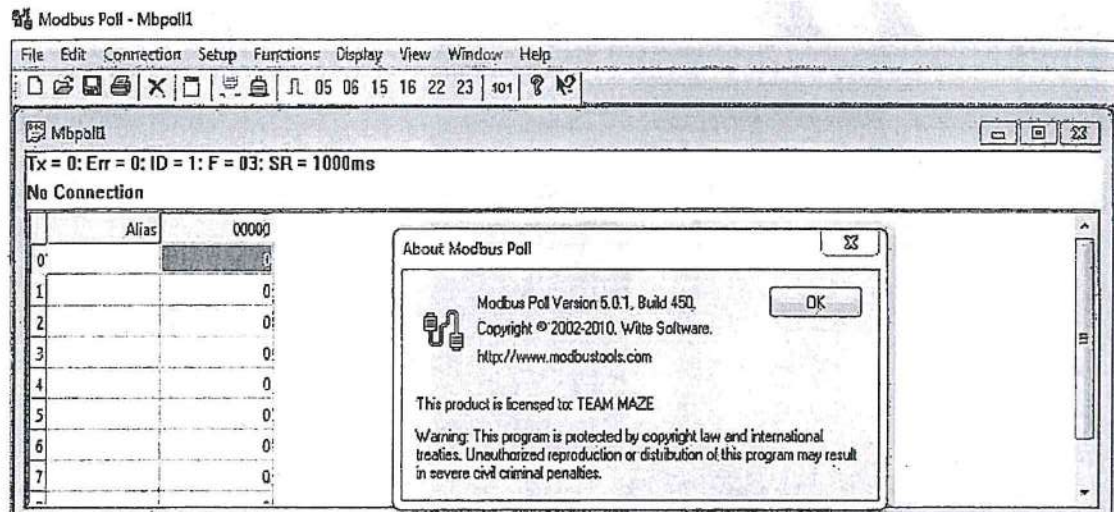
The image of the energy meter is provided below for reference:-



This Premier 300 model of secure make energy meter consists of a RJ-11 port and it comes with a RS 485 extension unit for connecting/looping multiple energy meters. The cable from RJ-11 port of the energy meter is connected to



- (ii) The software used for energy meter configuration is Modbus Poll. The free version of the software has been used and it comes with a 10 minute session window. The details of the software is given below :-



Steps for configuration: -

Step-1: Open the Modbus poll software. The software version used is 5.0.1

Step-2: Click on Connection —> Connect , which opens the Connection Setup as displayed in figure below

Select the port, baud rate & other settings (As shown in the fig: 01)

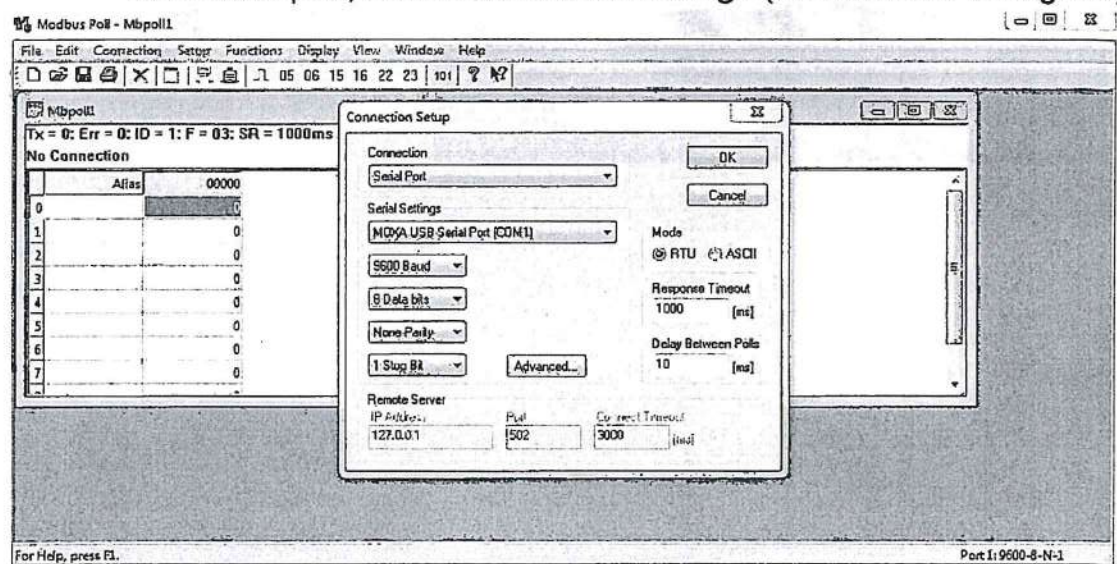
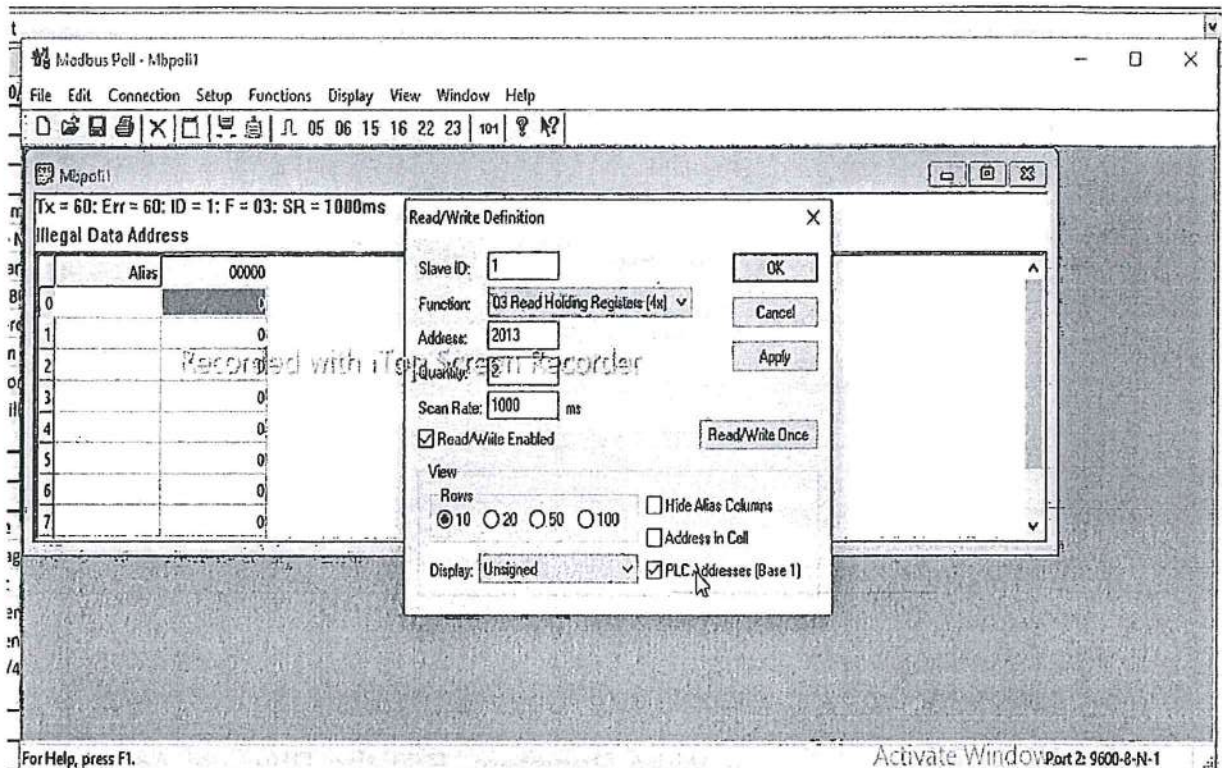


Fig-01

Step-3: Click on Setup  $\longrightarrow$  Read/Write Definition

The Slave ID is 1 by default; enter the address as per the MODBUS mapping sheet provided by the respective OEM of the energy meter. This address is of MODBUS ID.

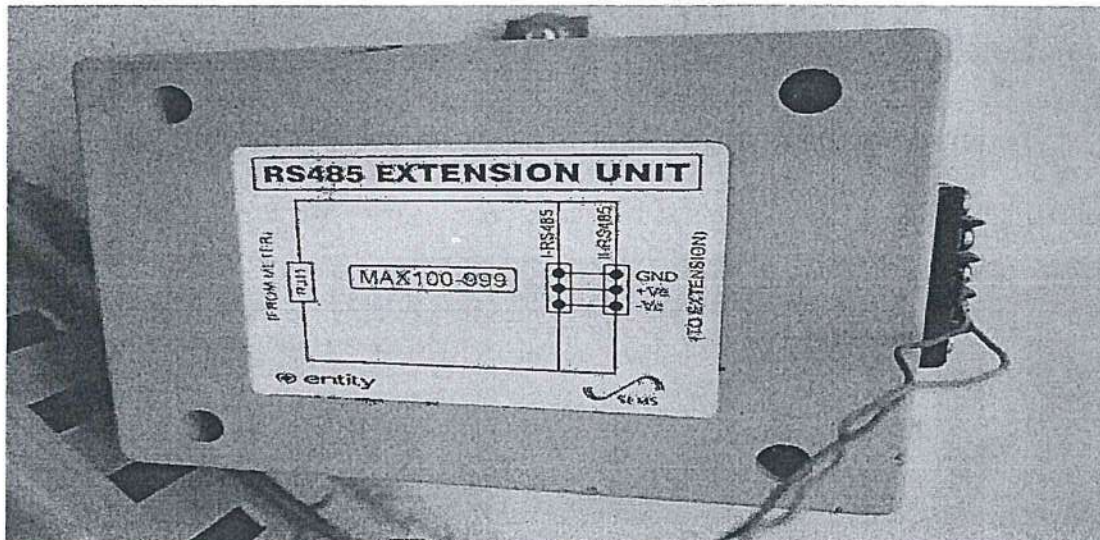


Step-3 : Click on Setup  $\longrightarrow$  Read/Write Definition

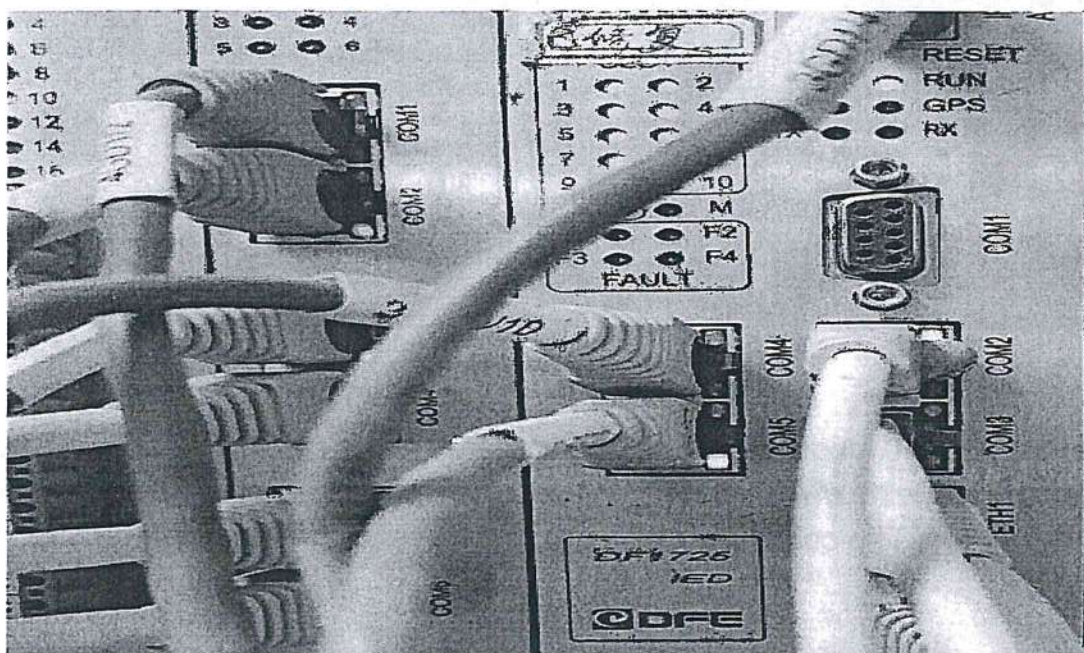
Enter the address as per the MODBUS mapping sheet provided by the respective OEM of the energy meter. This address is starting address of Parameters read by energy meter. As seen in the image below, the software starts reading the instantaneous values of the various parameters.



this RS 485 extension unit. The diagram of RS 485 extension unit is provided below:-

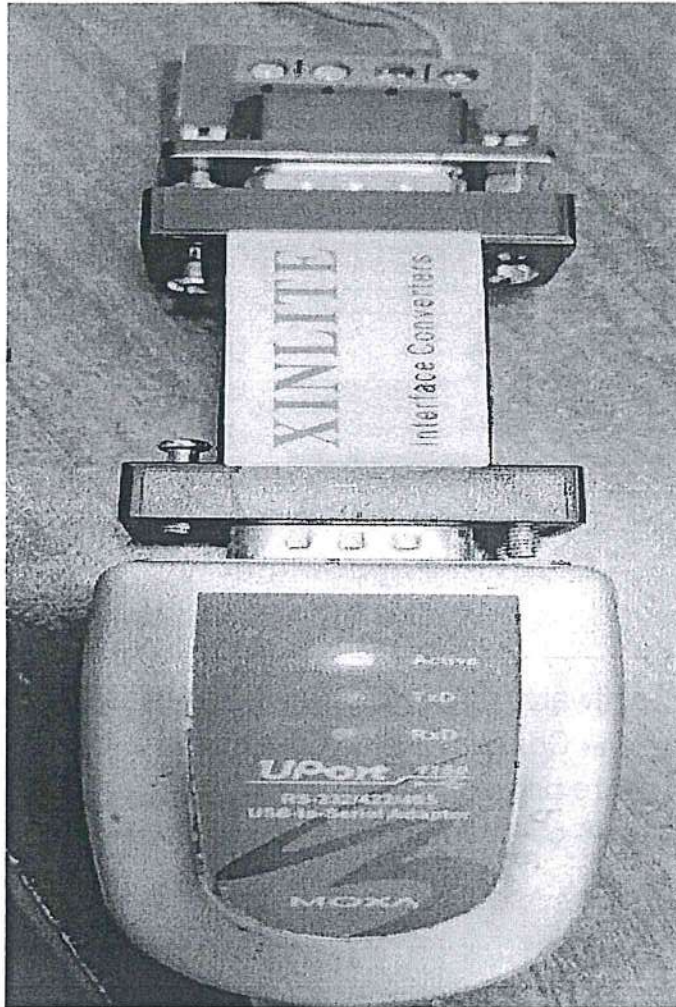


The positive and negative connections from this RS 485 extension unit is extended to the Dongfang RTU through a 3 core, 2.5 sq mm shielded cable. As visible in the diagram provided below, the RS 485 port (COM 4 port) in the RTU has been used for connection in RTU.

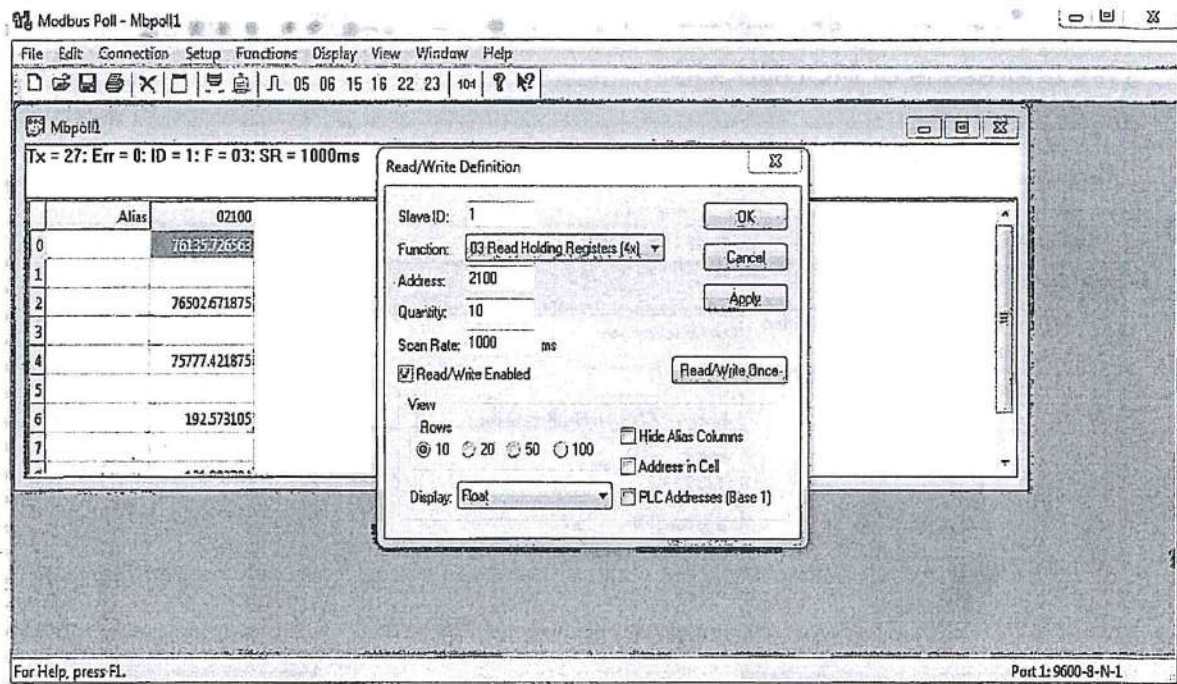


### Configuration in energy meter

- (i) For configuration in energy meter i.e. configuring the meter id, the energy meter is connected to a laptop through a combination of converters viz. RS 485 to RS 232 converter and RS 232 to USB Converter. The diagram of the converter used is given below:-

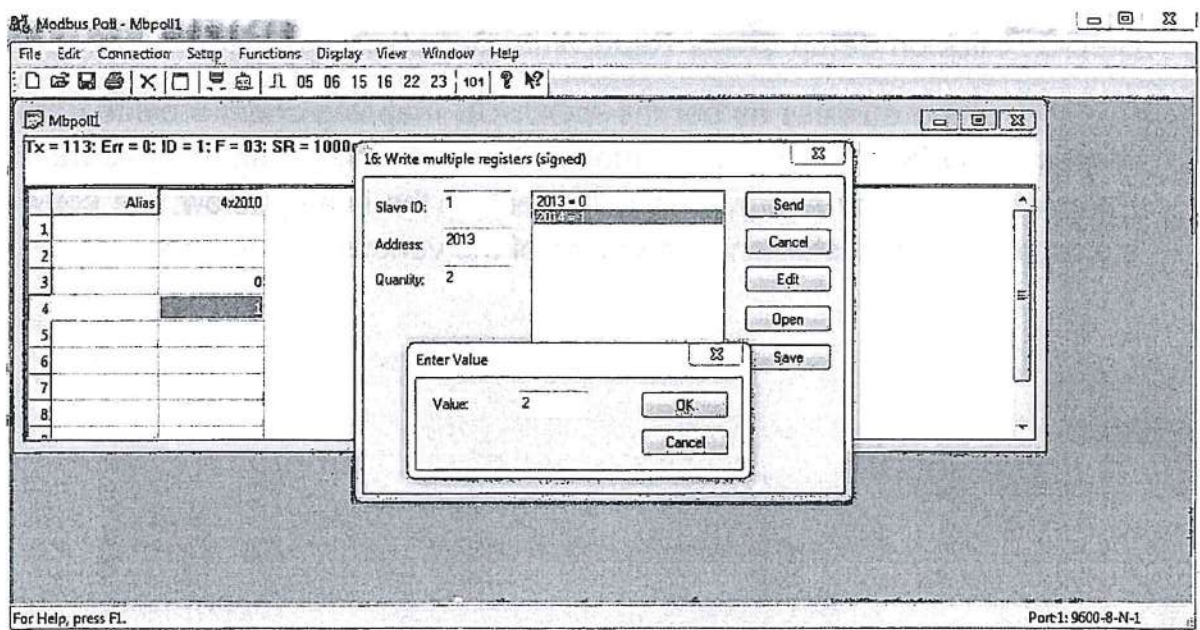




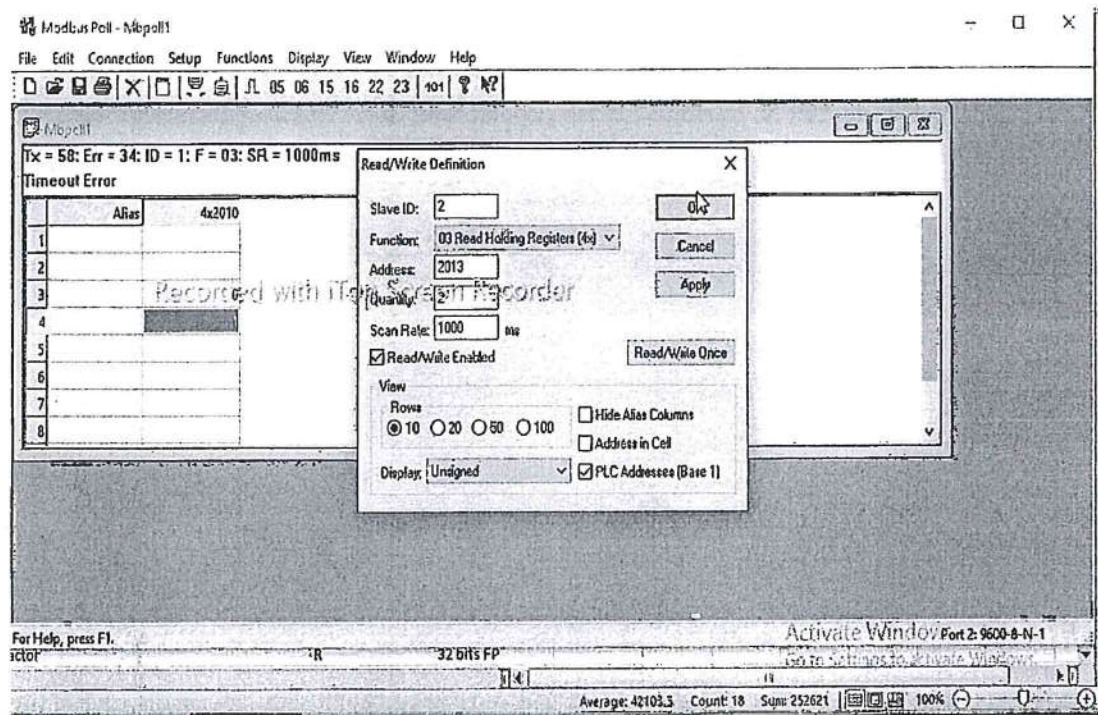


### To Change meter ID in case of multiple Energy meters

Click on Functions  $\longrightarrow$  Write Registers, Edit the Physical Address with value 2,3,4... which defines the energy meter ID. Click Send.



To read the values of this meter, again go to Read/Write Definition enter the slave ID 2 and other settings as previously done.



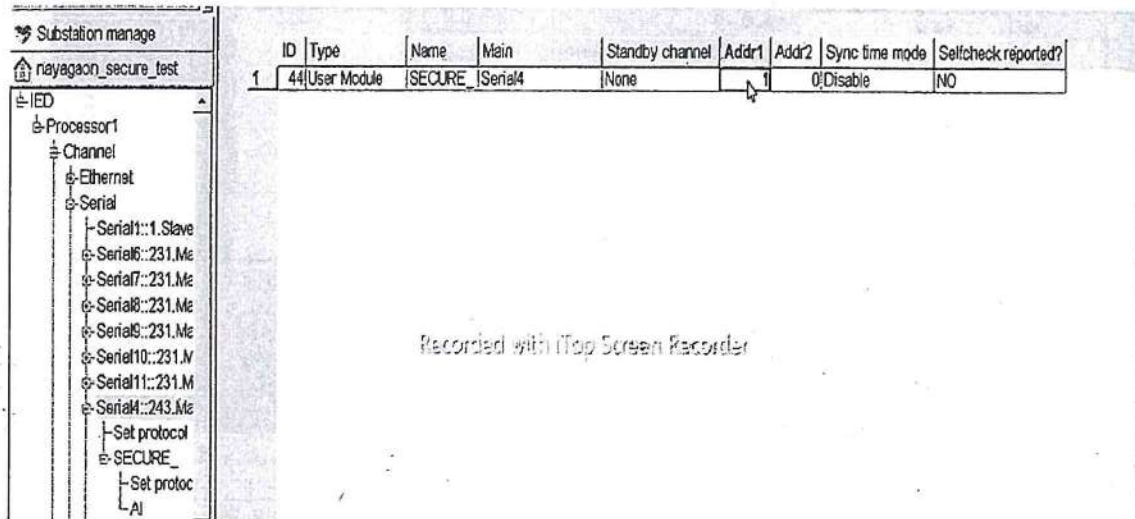
### Configurations in RTU (Donfang make)

As already mentioned earlier, we have connected the energy meter output in COM 4 Port of RTU. So in RTU Configuration, we configure the settings for this port as shown in the below images:-

	Name	Protocol select	Description	Scan interval(ms)	Standby channel	Standby mode	R&T Und
1	Serial1	1.Slave_Maintain		200	None	No spare, single channel	Normal
2	Serial6	231.Master_MFT Modbus		30	None	No spare, single channel	Normal
3	Serial7	231.Master_MFT Modbus		40	None	No spare, single channel	Normal
4	Serial8	231.Master_MFT Modbus		50	None	No spare, single channel	Normal
5	Serial9	231.Master_MFT Modbus		60	None	No spare, single channel	Normal
6	Serial10	231.Master_MFT Modbus		70	None	No spare, single channel	Normal
7	Serial11	231.Master_MFT Modbus		80	None	No spare, single channel	Normal
8	Serial4	243.Master_MODBUS		10	None	No spare, single channel	Normal
9	Serial5	243.Master_MODBUS		200	None	No spare, single channel	Normal
10	Serial2	239.Slave_IEC101Eh		200	None	No spare, single channel	Normal
11	Serial3	239.Slave_IEC101Eh		200	None	No spare, single channel	Normal



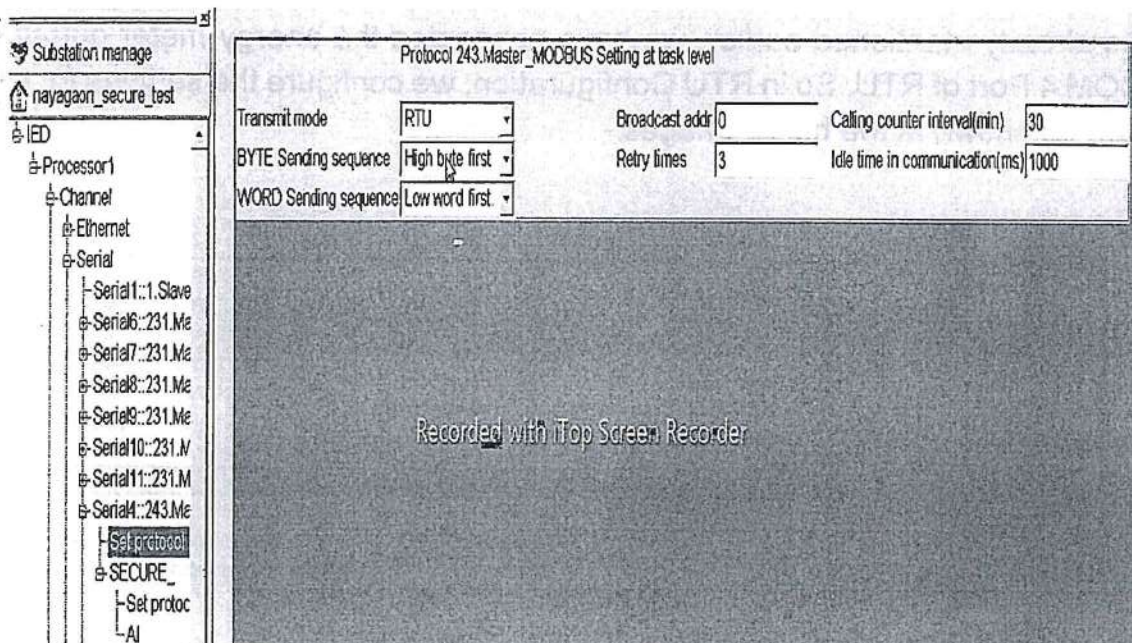
Now configuration is done for MODBUS ID of energy meter which is by default 1. We will enter the address given for energy meter.



ID	Type	Name	Main	Standby channel	Addr1	Addr2	Sync time mode	Selfcheck reported?
1	44>User Module	SECURE_Serial4	Serial4	None	1	0	Disable	NO

Recorded with ITop Screen Recorder

Now we will set the protocol parameters for the serial port as shown below:-

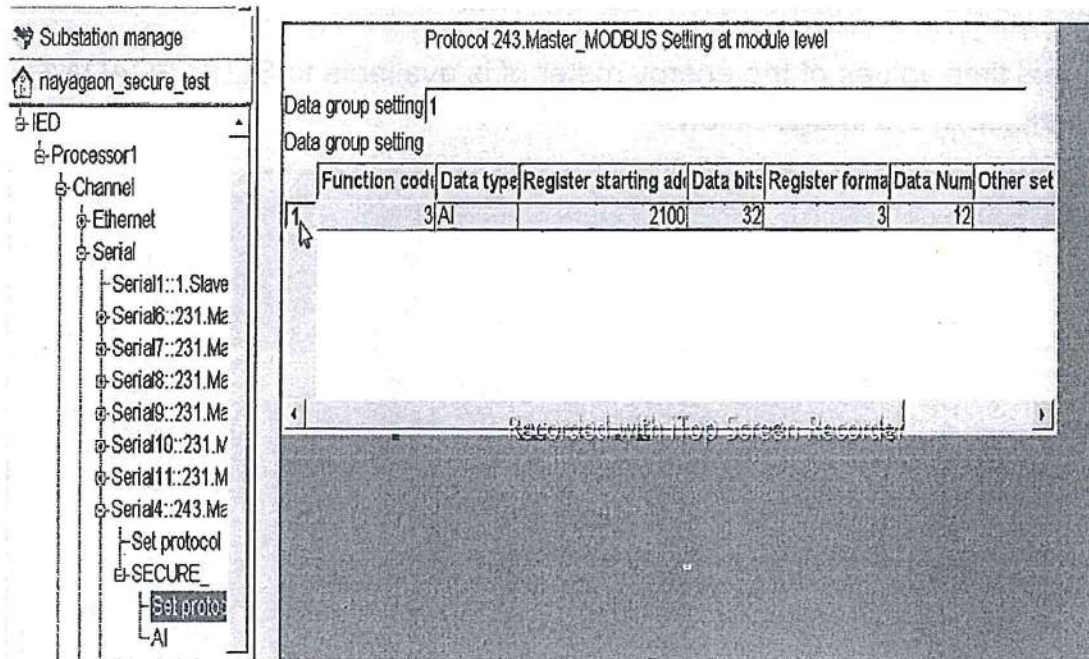


Protocol 243.Master\_MODBUS Setting at task level

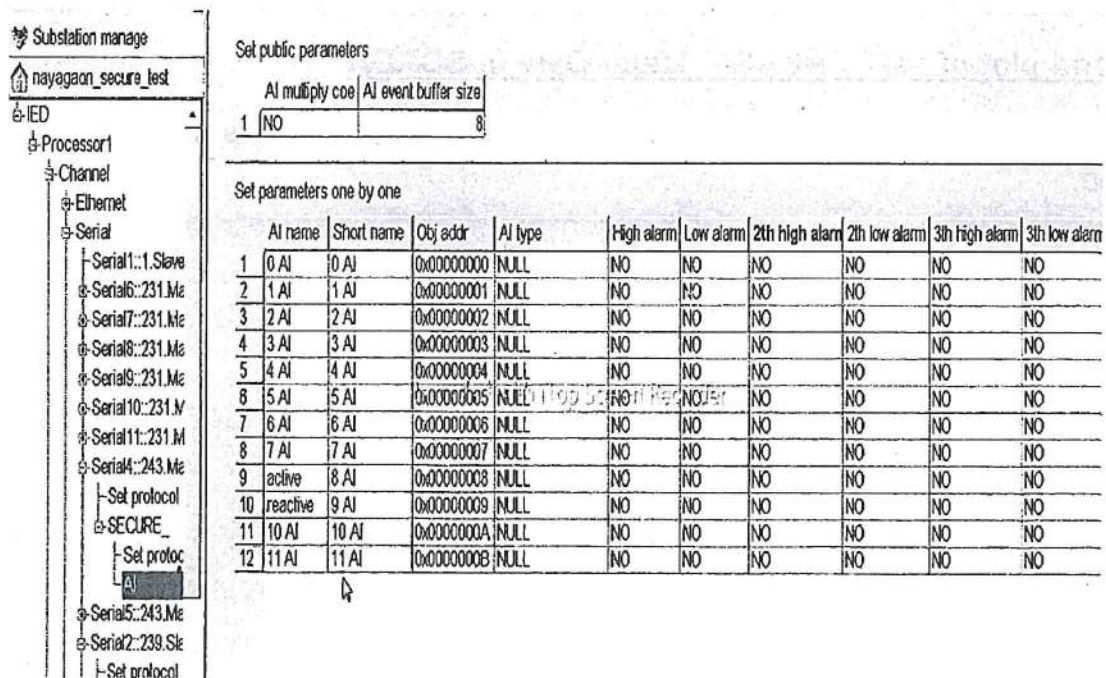
Transmit mode	RTU	Broadcast addr	0	Calling counter interval(min)	30
BYTE Sending sequence	High byte first	Retry times	3	Idle time in communication(ms)	1000
WORD Sending sequence	Low word first				

Recorded with ITop Screen Recorder

Now we will configure settings for the energy meter in RTU:-

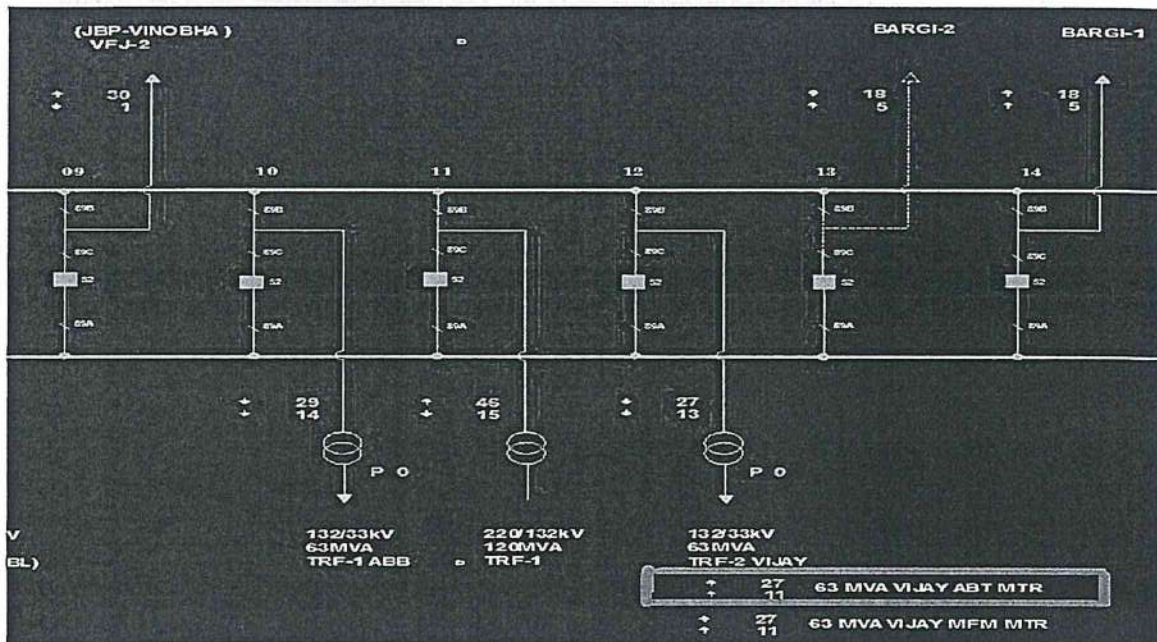


The settings of the various parameters read by energy meter are configured in RTU as shown below:-



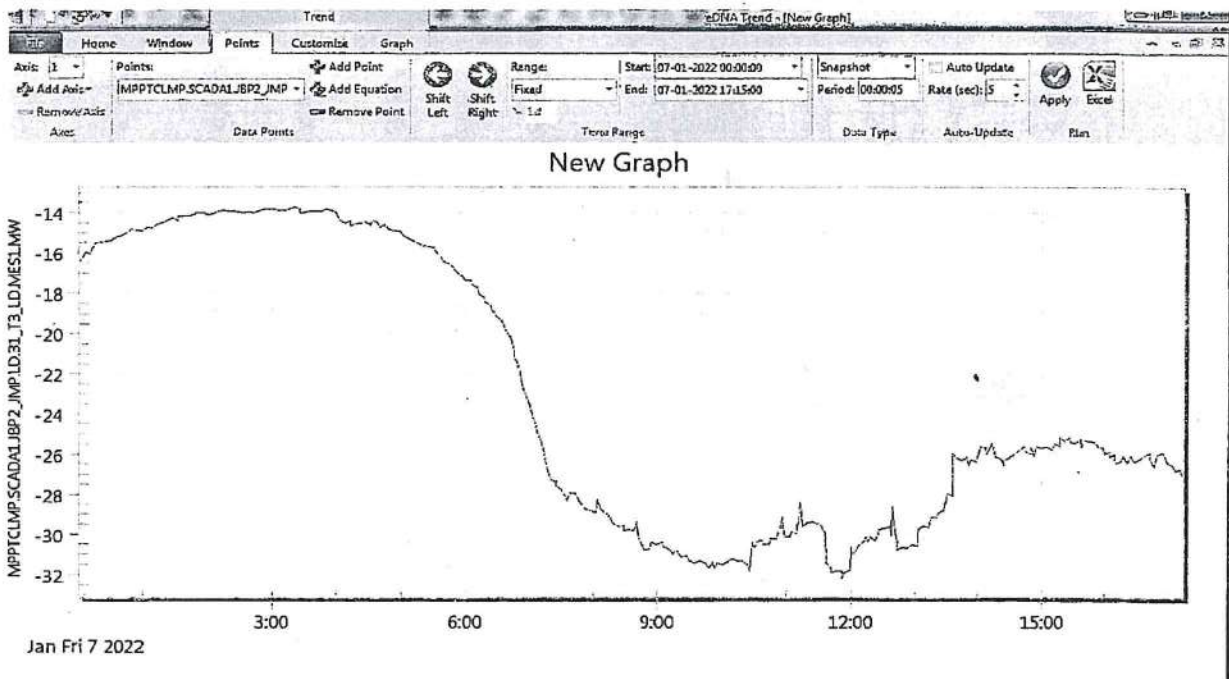


The real time values of the energy meter of is available to SLDC SCADA/EMS as depicted in the image below:-



### Trend plot of ABT/ENERGY Meter Data in SCADA

As it is clearly visible from the trend, the energy meter data is updating in real time.





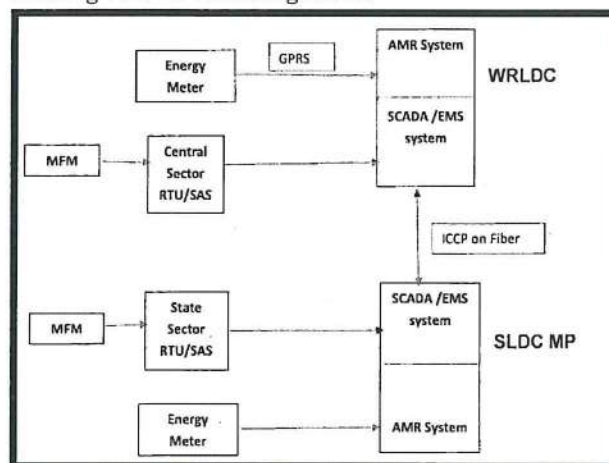


**Observation/comments of SRPC Secretariat on the WRPC/MP proposal of integration of Meters into SACDA/EMS system:**

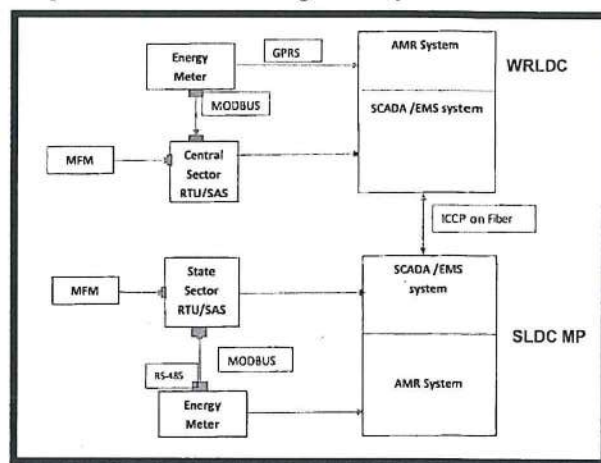
1. The issues of mismatch in SCADA data (used for real time operation of the grid monitoring/controlling of drawl by States) with SEM data (fetched after a week and used for commercial settlement) were raised by SR constituents in various forums. The need for AMR scheme had been felt keeping in view high RE ingress, stricter DSM Regulations, SCADA related issues etc.
2. In the meeting convened by Chairperson, CEA with RPCs, CTU, NLDC and States on 19.11.2020, the following were decided:
  - i) All existing IEMs shall be replaced with new technology IEMs having facility to communicate recorded data to LDCs in real time.
  - ii) All future IEMs at ISTS interface points shall have the feature of user configurable 5/15 min time block **along with real time streaming of 1 minute (at least) instantaneous data.**
  - iii) A joint committee comprising the members from each RPC, CEA, CTU/PGCIL & POSOCO to prepare the Technical Specifications (TS) of the 5/15 Minute Interface Energy Meters (IEMs) with Automatic Meter Reading (AMR) and Meter Data Processing (MDP) for interstate transmission system at PAN India basis **along with the online streaming of 1-minute MW data to SLDCs.**
  - iv) The proposal of GETCO/WRPC had been deliberated and decided that state utilities may put additional meters in series with the existing meters at the ISTS locations at their own cost in consultation with CTUIL/PGCIL to analyse and minimize the cost of DSM penalties.  
[It was learnt from WRPC that the series meter pilot project of GETCO was in tendering process for installation of 94 meters at 22 substations in series with the existing meters at ISTS points. Permission from PGCIL was awaited for installation.]
3. Subsequently, NPC Division had constituted a Joint Committee for finalizing the TS of the 5/15 Minute Interface Energy Meters (IEMs) with Automatic Meter Reading (AMR) and Meter Data Processing (MDP) **along with the online streaming of 1-minute MW data to SLDCs.** Four meetings of Joint Committee were held so far. In the 4<sup>th</sup> Meeting of Joint Committee held on 06.04.2022, it was noted that TS would be finalized based on the deliberations in that meeting.
4. MP SLDC/WRPC have now proposed to carry out the pilot project for integration of energy meters installed at ISTS interface points through the RS 232 Port in the state SCADA System and MP SLDC had informed that they have successfully integrated the SEM data (220 kV Jabalpur) in their SCADA system.

5. Existing and Proposed scheme(by MP SLDC) of arrangement are as below:

**Existing Scheme of Arrangement:**



**Proposed Scheme of Arrangement by MP SLDC:**



6. The following points may please be noted in this regard:

- i) There is a need for IEM data to be made available in real time at SLDCs, as it would help the SLDCs/DISCOMs to avoid unintentional deviations so that same data is visible for real time operation and as it will be used commercial settlement. This may be achieved by implementing the AMR scheme along with the online streaming of 1-minute (or less) MW data to SLDCs or any other scheme which serves the above purpose.
- ii) In the Joint Committee meetings, OEMs had informed that existing SEMs generally have three ports two communication ports (Optical & Ethernet) and one RS232/485 port (Read only). It was also confirmed by OEMs that three ports can transmit the data simultaneously. So spare ports are available for existing meters for transmitting the data and also simultaneously.
- iii) In many instances Main SEM is under recording/over recording or having errors, Check or Standby meter data may be used by RLDCs on post facto basis for energy accounting and the same would be given to RPCs for accounting. In that case, data used for accounting and real-time operation would be different. Even if Check & Standby meters are integrated for this purpose, system operator follows the Main Meter data only in the absence of correctness of data. Further there is Modbus, RS232/485 Extension units etc and there are chances of data hanging due to these intermediate electronic equipment. The same may be the case in proposed AMR scheme (1 min instantaneous data for SLDC). **Therefore no entity should raise any Techno Commercial issues with respect to account prepared based on SEM data and what was visible during real time operation at SLDC.**



- iv) It needs to be confirmed with different OEMs whether their existing meters (L&T, Secure etc.) are able to transfer the data if they are integrated with the SCADA and without any delay & without affecting the meter data stored (though confirmed by MPSLDC in their proposal) and during the download process (DCD)/AMR transfer.
- v) SCADA is not reliable as it has issues due to communication channel availability, terminal equipment issues, communication medium issues, accuracy of RTUs, Transducers etc. Also the data update rate from IEM through SCADA may depend on RTU & communication channel etc. The issues presently being faced in respect of communication are likely to be faced in proposed AMR scheme. Communication systems need to be strengthened for proper functioning of SCADA/AMR etc. **Therefore no entity should raise any Techno Commercial issues with respect to account prepared based on SEM data and what was visible during real time operation at SLDC due to communication issues.**
- vi) Cyber Security aspects also need to be looked into.
- vii) As can be seen from MP proposal that other than STU network IEM data would be first reaching the RLDC and then to SLDC through ICCP. POSOCO has shown apprehension in transferring IEM data through ICCP (through Web based application proposed in AMR scheme). Views of POSOCO could be sought.

**The pilot project proposed by MP SLDC may be agreed for implementation for specified period. The proposed scheme may be reviewed after implementation of pilot project, considering the advantages & deficiencies observed during pilot.**

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**POWERGRID comments/ inputs on proposal of MP SLDC-reg.**

The proposal of MPPTCL has been reviewed by POWERGRID, for two types of substation (Architecture is attached).

**Substations (with conventional control system):**

These substations are having OLD RTUs and it is not feasible to integrate IEMs through old RTU. These old RTUs are planned to be replaced with new RTUs, which support IEMs integration. Hence, after replacement of OLD RTUs, integration of all the IEMs are possible using existing infrastructure after suitable modification of configuration of new RTUs. However, continuity/availability of SCADA data to RLDC may be adversely affected with increased data traffic. Further, the configuration may get affected during any upgradation/modification done by POWERGRID on it's RTU during routine O&M resulting in loss of energy data transmission.

**Substations (with SAS):**

These substations do not have RTUs for data transmission to RLDCs. The data to RLDCs are transmitted through substation gateways (PC based). These gateways are also used for remote operation of substation. The integration of IEMs with existing infrastructure may involve substation BCUs which is a critical part of the substation control and protection system.

It is pertinent to mention here that incorrect configuration or errors in communication, may also cause failure/loss of functionality of BCU. Thus, it is understood that integration of SEM in existing BCU could have detrimental effect on safe and secure substation operation. Further, the configuration may get affected during any upgradation/modification done by POWERGRID on it's BCU/SAS during routine O&M resulting in loss of energy data transmission.

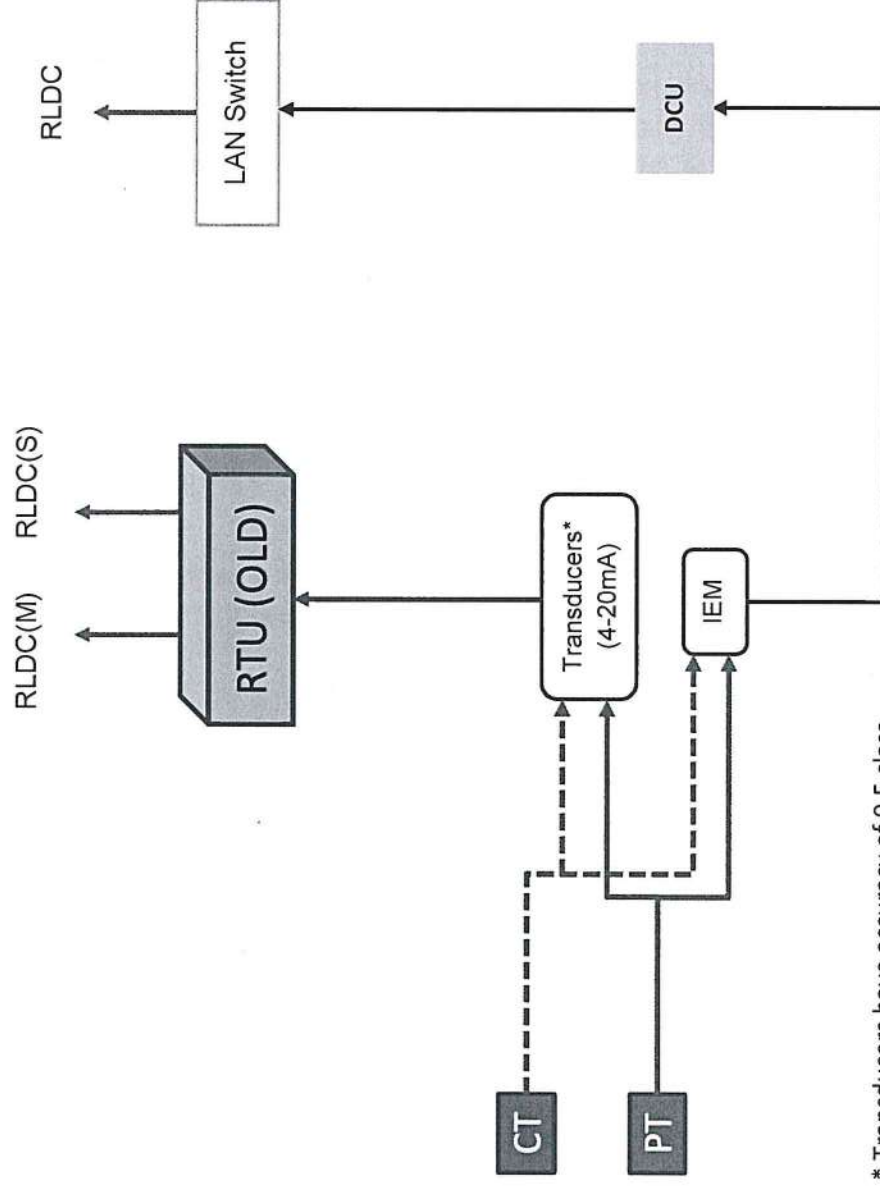
Moreover, this arrangement may adversely affect the performance of gateways with additional data traffic, thereby, functioning of substation automation system and substation operation/control may also be affected.

In view of above, the following is proposed.

1. For IEMs available at MPPTCL end, the meter data may be integrated with RTUs at MPPTCL substation.
2. For IEMs available at POWERGRID end, the meter data may be taken, through separate communication channel i.e. GPRS, etc directly to SLDC.

Moreover, the proposed scheme may also be reviewed by RLDCs.

## CONVENTIONAL SUBSTATIONS WITH OLD RTU

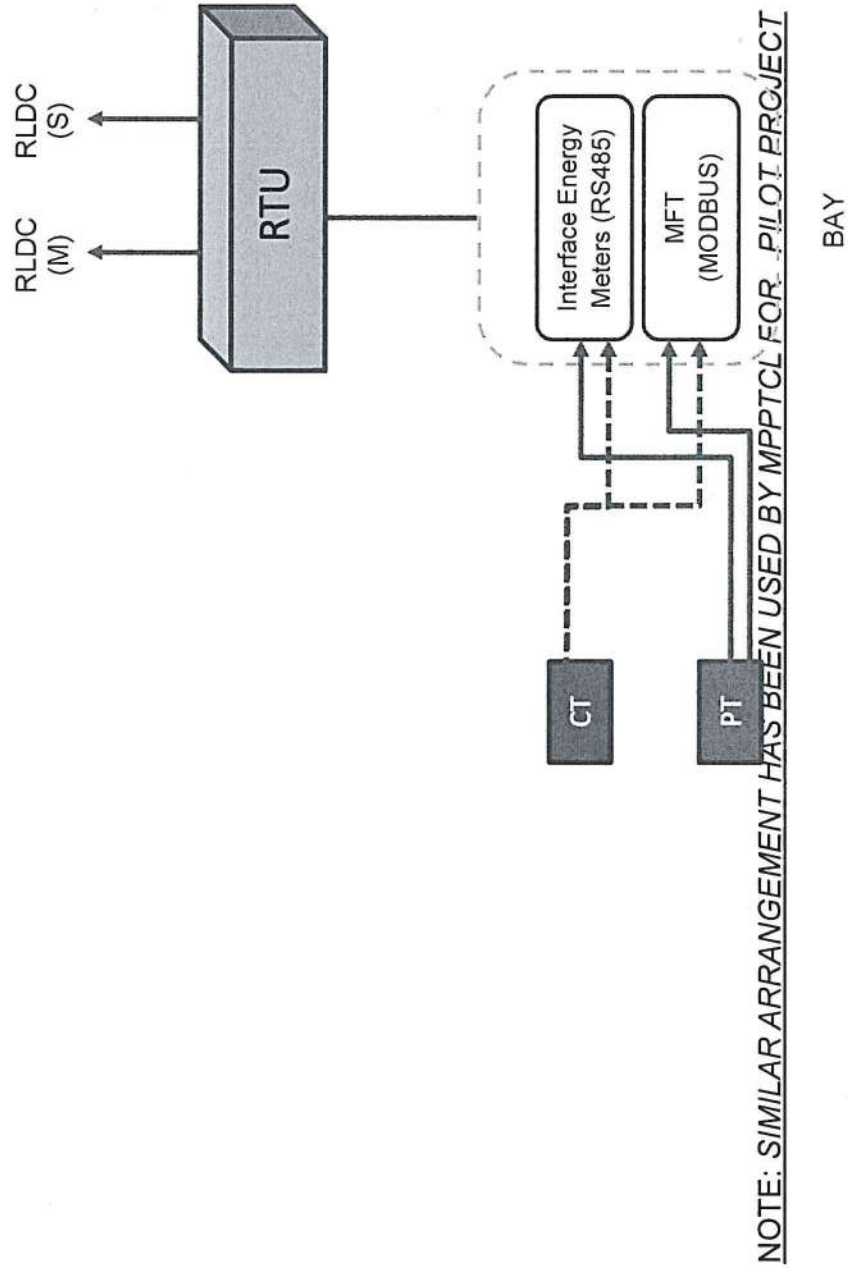


\* Transducers have accuracy of 0.5 class

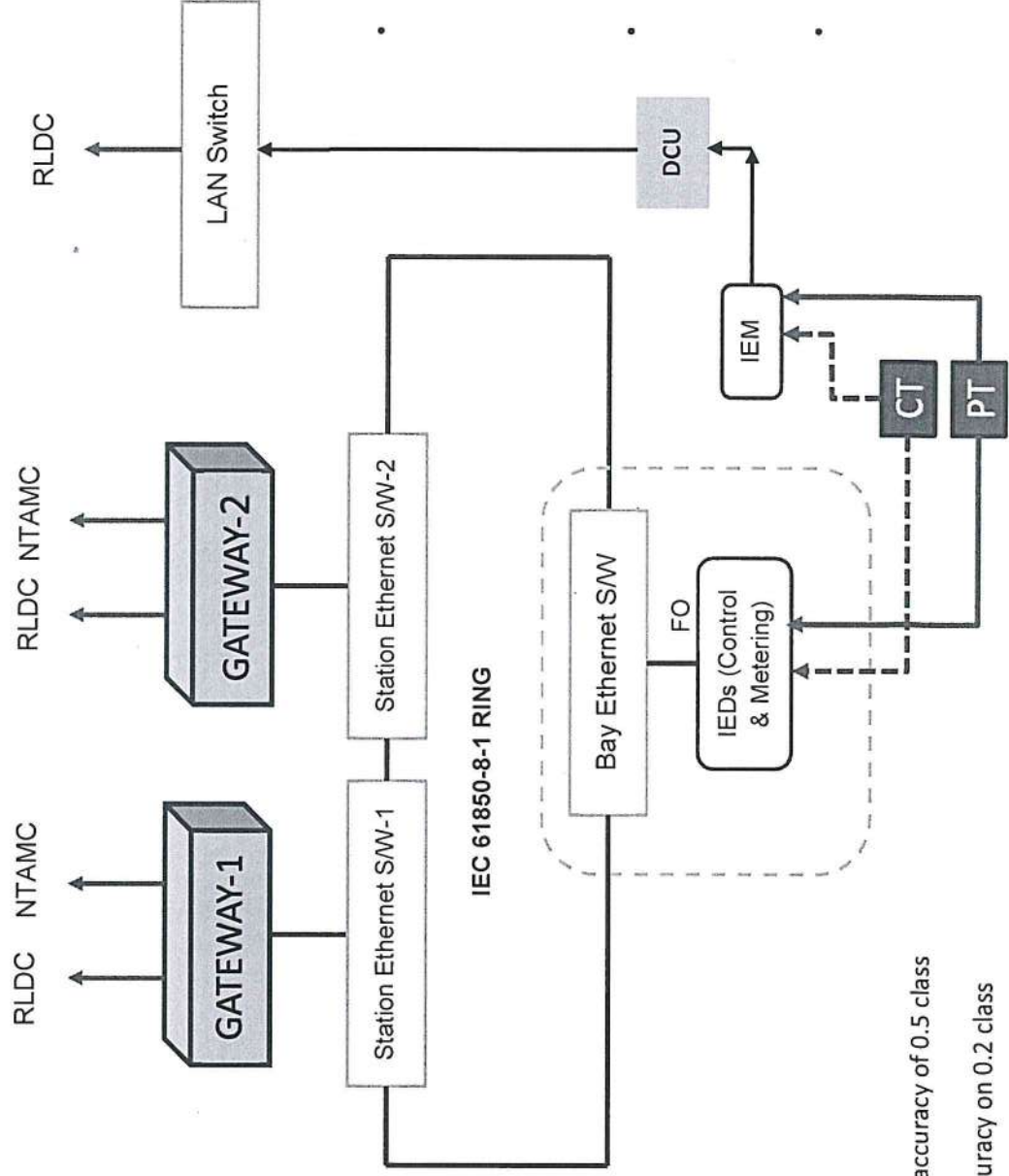
# SEM Meter have accuracy on 0.2 class

- Transducers are used to calculate the MW/MVAR for onwads communication to RLDC-SCADA through RTU. This data is real time data, without time-stamp.
- IEM data is time stamped energy data of 15 min time block.
- Both the data are communicated through same ULDC link but with separate allocation of bandwidth.

## COVNENTIONAL SUBSTATIONS WITH NEW RTU



## SAS BASED SUBSTATIONS



- IEDs calculate MW/MVAR and communicate it to RLDC-SCADA through Gateway. This data is real time data, without time-stamp.
- SEM data is time stamped energy data of 15 min time block and communicated to RLDC through AMR system.
- Both the data are communicated through same ULDC link but with separate allocation of bandwidth.

\* Metering IEDs have accuracy of 0.5 class

# SEM Meter have accuracy on 0.2 class



# ANNEXURE-IV

Overview of the status of Islanding Scheme in all Regions						
Regions	Total Number of Islanding Schemes	No. of Implemented/Inservice IS (Green Color)	No. of IS which are Under Implementation (Yellow Color)	No. of Newly proposed Islanding Scheme which are under design/Under Implementation stage (Red Color)	No. of Newly proposed Islanding Scheme which are Implemented/Inservice	No. of IS having SCADA visibility
SR	7	5	1	1	2	7
ER	10	4	4	2	0	5
NR	11	2	2	7	0	4
WR	12	6	1	5	0	0
NER	3	1	1	1	0	3
	43	18	9	16	2	19



Central Electricity Authority  
National Power Committee Division

Monthly MIS report - Islanding Scheme (IS) of Southern Region (SR)

Status updated on 21.04.2022

SN	Name of Islanding Scheme	Category A/B	Sub-Category- (City/Major Town/ Strategic Load/Sensitive Generation)	Status (Category A - In-Service/ Under Review/ Reviewed & Under Implementation) (Category B-DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implementation)	Timeline for completion of Review/ Reviewed & Under Implementation for Category A (Timeline for implementation for Category B (DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implementation)	Progress of the scheme during the last month	Healthiness of the Scheme	Timeline for SCADA/ SLD/ R/LDC	Remarks, if any (Major Change in the scheme may also be intimated)
<b>Category I</b>									
I	Hyderabad IS	A	City/Major Town/ Strategic Load	Reviewed scheme implemented w.e.f. 31.07.2021/ In service	Review completed on 05.05.2021.	NA	Healthy	November, 2021/ Completed on 30.11.2021	—
2	Chennai IS	A	City/Major Town/ Strategic Load	Reviewed scheme under Implementation	Review completed on 18.05.2021. Original Target Date for Implementation: December, 2021 Revised Target Date for Implementation: April, 2022	All stakeholders confirmed completion of works for implementation of Island except TANTRANSO. TANTRANSO: Installation & settings of Trip Relays completed for all boundary elements. Pending for 1 out of 47 elements within the Island. Pending for want of LC.	Healthy	November, 2021/ Completed on 28.02.2022	—
3	Kudankulam IS	A	City/Major Town/ Strategic Load/ Sensitive Generation	Reviewed scheme implemented w.e.f. 31.12.2021/ In Service	Review completed on 18.08.2021. Target Date for Implementation: December, 2021 Reviewed scheme put into service w.e.f. 31.12.2021	All stakeholders confirmed completion of works for implementation of Kudankulam island except TANTRANSO. TANTRANSO: Completed installation & settings of all boundary trip relays except one feeder. (Pending for want of new UFR relays). However, confirmed that Islanding would be achieved due to implementation of the trip setting at the other end of the said feeder. PO placed and material supply awaited.	Healthy	December, 2021/ Completed on 31.03.2022	—
4	Bengaluru IS	B	City/Major Town/ Strategic Load	Implementation Stage	The Scheme was identified in December 2020. Design completed and the scheme is expected to be implemented by January, 2022. Target Date for Implementation: December, 2021 Revised Target Date for Implementation: April/ May, 2022	All stakeholders except KPCL confirmed completion of works for implementation of Bengaluru island. KPCL informed that underfrequency trip to be enabled for 220kV Sharavathi-Belagavi line and 220kV Sharavathi - Sirsi D/C line, and requested for time extension up to 15.05.2022.	NA	December, 2021/ Certain modifications were suggested to the created SCADA display & are under implementation. Targeted to be completed by April/ May, 2022.	—
<b>Category II</b>									
5	Neyveli IS	A	City/Major Town/ Strategic Load	Reviewed Scheme implemented w.e.f. 01.11.2021/ In-Service	Review completed on 04.06.2021. Reviewed scheme put into service w.e.f. 01.11.2021	Implementation of the reviewed scheme completed by all sub-holding Utilities. TANTRANSO: Completed for all elements except one feeder; however stated that Islanding would be achieved due to implementation of the tripping at the other end of the said feeder	Healthy	November, 2021/ Completed on 28.02.2022	—

6	Visakhapatnam IS	B	City/Major Town/ Strategic Load	Implemented w.e.f. 31.07.2021/ In-Service	The Scheme was identified in Jan 2020, but owing to Covid-19 pandemic, the scheme was taken up for implementation in January, 2021. The scheme put into service w.e.f. 31.07.2021.	NA	Healthy	November, 2021/ Completed on 30.11.2021	—
7	Vijayawada IS	B	City/Major Town	Implemented w.e.f. 30.11.2021/ In-Service	The Scheme was identified in April 2021. Design completed and the scheme was put into service w.e.f. 30.11.2021	NA	Healthy	November, 2021/ Completed on 30.11.2021	—

<b>Category of Islanding Schemes:</b>	
Category 'A' IS	Islanding Schemes which are existing or already planned and in implementation stage.
Category 'B' IS	Islanding Schemes which are newly proposed.
Category-'I' IS	Islanding Schemes which are designed for the major cities, sensitive generation or strategic loads.
Category-'II' IS	Islanding Schemes other than category I are Category II IS
<b>Colour codes of Islanding Schemes:</b>	
Green	Implemented/In service Islanding Scheme
Yellow	Under review/ Under Implementation Islanding Scheme
Red	Newly proposed Islanding Scheme which are under design/under implementation stage

NA	Not Applicable
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**Central Electricity Authority**  
**National Power Committee Division**  
**MIS report - Islanding Scheme(s) of Eastern Region (ER)**

status as on 22.04.2022

S.No. (Color code for Islanding Scheme)	Name of Islanding Scheme	Category A/B	Sub-Category- (City/Major Town/Strategic Load/Sensitive Generation)	Status (Category A-In-Service/ Under Review/ Rejected & Under Implementation) (Category B-DPR Preparation/Study/ Design/ Approval/Procurement/Commenced on/ing/Implementation)	Timeline for completion of Review/ Rejected & Under Implementation for Category A Timeline for Implementation for Category B (DPR Preparation/Study/ Design/ Approval/Procurement/Commenced/Implementa- tion)	Progress of the scheme	Healthiness of the scheme	Timeline for SCADA SILDC/ SILDC/ RLDC	Remarks, if any (Major Change in the scheme may also be intimated)
<b>Category I</b>									
I	Kolkata (CLISC) IS	A	City/Major Town/ Strategic Load	Implemented In-Service	The scheme was last reviewed in February, 2021. No operational constraints have been reported.	NA	Healthy	Implemented on 13.11.2021	—
2	Prins IS	B	City/Major Town/ Strategic Load	DPR Preparation	Review of islanding study & designing of the logic. Implementation of Islanding Scheme. By June 2022	As per the decision of 45th TCC & ERPC Meeting held on 25th and 26th March 2022, ERPC vide letter no. ERPC/Operational/S202207 dated 18.04.2022 (Annexure) constituted a Technical Committee based on the nominations received for finalizing Prins Islanding Scheme.	NA	—	—
3	Ranish IS	B	City/Major Town/ Strategic Load	DPR Preparation	Review of islanding study & designing of the logic. Completed Implementation of Islanding Scheme. By Feb 2022	As per the decision of 45th TCC & ERPC Meeting held on 25th and 26th March 2022, ERPC vide letter no. ERPC/Operational/S202207 dated 18.04.2022 (Annexure) constituted a Technical Committee based on the nominations received for finalizing Ranish Islanding Scheme.	NA	—	—
<b>Category II</b>									
4	Bakrewar TPS IS	A	Industrial and Railway load	Implemented In-Service	The scheme was last reviewed in February, 2021. No operational constraints have been reported.	NA	—	Implemented in January, 2022	—
5	Italia (Tau Power) IS	A	Industrial areas of Italia and Port	Implemented In-Service	The scheme was last reviewed in February, 2021. No operational constraints have been reported.	NA	—	Implemented in January, 2022	—
6	Ilamvoh (Ilamvoh) IS	A	Industrial load	Implemented In-Service	The scheme was last reviewed in February, 2021. No operational constraints have been reported.	NA	—	Implemented in January, 2022	—
7	Ilal valley TPS IS	A	MCL Load	Under-implementation.	The scheme is under implementation and expected to complete by April 2022	In the 180th OGC Meeting, OP/CL representative submitted that the AIBB engineers would arrive by 27th March 2022 and the work is expected to be completed by the end of March 2022.	NA	April, 2022	—
8	Paraka STPS, NTPC IS	A	Industrial & ECL Load	Under revision	—	—	NA	Implemented in December 2021	Under revision due to change in network (230 KV PSTPS-Jalainia SIC line has been out because of collapse of several towers in the storm in April 2021)
9	Chandrapura IS of DVC System	A	Industrial load	Under revision	The scheme is under Review and scheme is expected to complete by September 2022.	In the 180th OGC Meeting, DVC representative submitted that the bid opening date has been extended to 23rd March 2022.	NA	September, 2022	Discussed in Special Meeting of ERPC held on 06.08.2021. Original scheme was with stage A of CTPS (A120 MW). As stage A of CTPS has been revised, the scheme is being revisited considering the stage B of CTPS (2x250 MW).
10	KHJNL IS of Bhor	A	Industrial & Station load	Under implementation	The scheme is under implementation and expected to complete by February 2022.	KHJNL Islanding scheme has been cleared as per the discussion of 180th OGC Meeting. Further, possibilities may be explored to study of islanding scheme considering the Bhoron units. The hardware procured for KHJNL Islanding scheme may be used for the same.	NA	—	—

**Category of Islanding Schemes:**

Category 'A' IS	Islanding Schemes which are existing or already planned and in implementation stage
Category 'B' IS	Islanding Schemes which are newly proposed
Category 'I' IS	Islanding Schemes which are designed for the major cities, sensitive generation or strategic loads

Category: II, IS	Islanding Schemes other than category I are Category II IS
Colour codes of Islanding Schemes:	
Green	Implemented/In service Islanding Scheme
Yellow	Under review/ Under Implementation Islanding Scheme
Red	Newly proposed Islanding Scheme which are under design/under implementation stage

NA	Not Applicable
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**Central Electricity Authority**  
**National Power Committee Division**  
**MIS report - Islanding Scheme (IS) of Western Region (WR)**

Status as on 05.05.2022

S.No. (Color code for Islanding Scheme)	Name of Islanding Scheme	Category A/B	Sub Category- (City/Major Town/ Strategic Load/Sensitive Generation)	Status (Category A -In-Service/ Under Review/ Under Implementation) (Category B-DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implementation)	Timeline for completion of Review/ Revised & Under Implementation for Category A Timeline for Implementation for Category B (DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implement ation)	Progress of the scheme	Healthiness of the scheme	Timeline for SCADA Visibility in Sub SLDC/ SLDC/ RLDC	Remarks, if any (Major Change in the scheme may also be intimated)
	I	II	III	IV	V	VI	VII	VIII	IX
<b>Category I</b>									
1	Mumbhai Islanding Scheme	A	City/ Strategic Load	Implemented/In-service	Last reviewed on 04.04.2021 and no operational constraints found	NA	Healthy	Aug 2022	System study is being carried out at JTTB and further review, if any, to be taken after outcome of study. Draft report has already submitted by JTTB to Tata Power and final report is
2	Uran Islanding Scheme	A	City/Major Town	Implemented/In-service	Scheme last reviewed on 04.04.2021 and no modification required and no operational constraint found	NA	Healthy	Aug 2022	—
3	Sagar Islanding Scheme	A	City/Major Town	Implemented/In-service	Scheme last reviewed on 04.04.2021 and no modification required and no operational constraint found	NA	Healthy	Aug 2022	—
4	Alimnashah City Islanding Scheme	A	City/Major Town/ Strategic Load	Implemented/In-service	Scheme last reviewed on 04.04.2021 and no modification required and no operational constraint found	NA	Healthy	Aug 2022	—
5	NAPS 1&2 Islanding Scheme	A	Sensitive Generation	Implemented/In-service	Scheme last reviewed on 04.04.2021 and no modification required and no operational constraint found	NA	Healthy	Aug 2022	—
6	NAPS 3&4 Islanding Scheme	A	Sensitive Generation	Under Implementation	Last reviewed on 04-07 June, 2021	—	Healthy	Aug 2022	—
7	Nagpur Islanding Scheme	B	City/Major Town/ Strategic Load	Design/Engineering Stage	Schematic design finished on during discussion on 04.04.2021, 24.06.2021, 26.06.2021	Detailed engineering is under progress.	NA	NA	—
8	Jamnagar Islanding Scheme	B	City/Major Town/ Strategic Load	Design/Engineering Stage	Schematic design finished on during discussion on 04.04.2021, 24.06.2021	Detailed engineering is under progress.	NA	NA	—
9	Bhay/Amjar(Kutna) Islanding Scheme	B	City/Major Town/ Strategic Load	Design/Engineering Stage	Schematic design finished on during discussion on 04.04.2021, 24.06.2021	Detailed engineering is under progress.	NA	NA	—
10	Jalolpur Islanding Scheme	B	City/Major Town/ Strategic Load	Design/Engineering Stage	Schematic design finished on during discussion on 04.04.2021, 24.06.2021	Detailed engineering is under progress.	NA	NA	—



Rajpur Islanding Scheme	B	City/Major Town	Design/Engineering Stage	Schematic design finalised on during discussion on 01.04.2021, 24.06.2021, 28.06.2021.	Detailed engineering is under progress.	NA	NA	—
<b>Category II</b>								
12	A	Nandesar Industrial Load	Implemented/Inservice	Scheme last reviewed on 04.04.2021 and no modification required and no operational constraint found.	NA	Healthy	Aug 2022	—

<b>Category of Islanding Schemes:</b>	
Category 'A' IS	Islanding Schemes which are existing or already planned and in implementation stage.
Category 'B' IS	Islanding Schemes which are newly proposed.
Category-'I' IS	Islanding Schemes which are designed for the major cities, sensitive generation or strategic loads.
Category-'II' IS	Islanding Schemes other than category I are Category II IS
<b>Colour codes of Islanding Schemes:</b>	
Green	Implemented/In service Islanding Scheme
Yellow	Under review/ Under Implementation Islanding Scheme
Red	Newly proposed Islanding Scheme which are under design/under implementation stage

NA	Not Applicable
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**Central Electricity Authority  
National Power Committee Division  
MIS report - Islanding Scheme (IS) of Northern Region (NR)**

status as on 13.04.2022

S.No. (Color code for Islanding Scheme)	Name of Islanding Scheme	Category A/B	Sub Category- (City/Major Town/ Strategic Load/Sensitive Generation)	Status (Category A - In-Service/ Under Review/ Reviewed & Under Implementation) (Category B - DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/In plementation)	Timeline for completion of Review/ Reviewed & Under Implementation for Category A Timeline for implementation for Category B (DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implementati on)	Progress of the scheme	Healthiness of the scheme	Timeline for SCADA Visibility in Sub SLDC/ SLDC/ RLDC	Remarks, if any (Major Change in the scheme may also be intimated)
I		II	III	IV	V	VI	VII	VIII	IX
<b>Category I</b>									
1	Delhi IS	A	City/Major Town/ Strategic Load	In service/ Under revision	Reviewed scheme will be completed by January, 2022.	—	Healthy	Visible in Delhi SLDC	—
2	NAPS IS	A	Sensitive Generation	Implemented/Inservice	The review of IS has been done with peak load of Summer and Winter 2019-20 and no operational constraints found.	NA	Healthy	Visible in UP SLDC	—
3	Lucknow (Unchhahar) IS	A	City/Major Town	Under Design Stage	—	UP has got offer from CPRI for study. The estimated time of study is 5 months from date of acceptance.	NA	Visible in UP SLDC	—
4	RAPS IS	A	Sensitive Generation	Implemented/Inservice	Review of IS has been done in view of last Peak/off-peak loading and no operational constraints found	Rajasthan SLDC has created SCADA display of Islanding scheme.	Healthy	Visible in Rajasthan SLDC	—
5	Deliradam IS	B	City/Major Town/ Strategic Load	Planning / Design Stage	—	Matter is pending at Uttarband SLDC for finalization/revision of scheme.	NA	Sept 2022	—
6	Agra IS	B	City/Major Town/ Strategic Load	Planning / Design Stage	—	UP has got offer from CPRI for study. The estimated time of study is 5 months from date of acceptance.	NA	Sept 2022	—
7	Jodhpur-Barmer-Kajwast IS	B	City/Major Town/ Strategic Load	Planning / Design Stage	The Planning/design of the scheme is in progress.	Visit of Rajasthan officials at NRILDC is awaited for finalization of feasibility study.	NA	Sept 2022	—
8	Nabha Power Rajpura IS	B	City/Major Town/ Strategic Load	Planning / Design Stage	Scheme design is being finalized and will be submitted to CPRI for study.	Punjab has sent the offer to CPRI for study of Islanding Schemes.	NA	Sept 2022	—
9	Pallankot-RSD IS	B	City/Major Town/ Strategic Load	Planning / Design Stage	Scheme design is being finalized and will be submitted to CPRI for study.	Punjab has sent the offer to CPRI for study of Islanding Schemes.	NA	Sept 2022	—
10	Surangah IS	B	Strategic Load	Planning / Design Stage	The Planning/design of the scheme is in progress.	Visit of Rajasthan officials at NRILDC is awaited for finalization of feasibility study.	NA	Sept 2022	—
<b>Category II</b>									
11	Talwandi Sabo IS	B	City/Major Town	Planning / Design Stage	Scheme design is being finalized and will be submitted to CPRI for study.	Punjab has sent the offer to CPRI for study of Islanding Schemes.	NA	Sept 2022	—

**Category of Islanding Schemes:**

Category 'A' IS: Islanding Schemes which are existing or already planned and in implementation stage.

Category 'B' IS: Islanding Schemes which are newly proposed.

Category-'I' IS: Islanding Schemes which are designed for the major cities, sensitive generation or strategic loads.

Category-'II' IS: Islanding Schemes other than category I are Category II IS

**Colour codes of Islanding Schemes:**

Green: Implemented/In service Islanding Scheme

Yellow	Under review/ Under Implementation	Islanding Scheme			
Red	Newly proposed	Islanding Scheme which are under design/under implementation stage			
NA	Not Applicable				



Central Electricity Authority  
National Power Committee Division  
MIS report - Islanding Scheme (IS) of North Eastern Region (NER)

status as on 21.04.2022

[illegible]

## Category of Islanding Schemes:

Category 'A' IS	Islanding Schemes which are existing or already planned and in implementation stage.
Category 'B' IS	Islanding Schemes which are newly proposed.
Category-'1' IS	Islanding Schemes which are designed for the major cities, sensitive generation or strategic loads.
Category-'11' IS	Islanding Schemes other than category I are Category II IS
<b>Colour codes of Islanding Schemes:</b>	
Green	Implemented/In service Islanding Scheme
Yellow	Under review/ Under Implementation Islanding Scheme
Red	Newly proposed Islanding Scheme which are under design/under implementation stage

NA	Not Applicable
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**Format for submission of status of RGMO and FGMO by NERPC**

Sr. No.	Name of Generating Station	Sector (State/Centre/ Pvt)	Unit No. of Generating Station	Capacity (MW) of Unit No. of Generating Station	Status of RGMO		Enable/Disable status of FGMO			
					Availability of RGMO	Enable/Disable status of RGMO				
					(Yes/No)					
1	Ranganadi HEP	Central	Unit I	135	Yes	Enable	Enable			
			Unit II	135	Yes	Enable	Enable			
			Unit III	135	Yes	Enable	Enable			
2	Pare HEP	Central	Unit I	55	Yes	Enable	Enable			
			Unit II	55	Yes	Enable	Enable			
3	Kameng HEP	Central	Unit I	150	Yes	Enable	Enable			
			Unit II	150	Yes	Enable	Enable			
			Unit III	150	Yes	Enable	Enable			
			Unit IV	150	Yes	Enable	Enable			
4	Kopili HEP	Central	Unit I	50	Under long Outage					
			Unit II	50						
			Unit III	50						
			Unit IV	50						
5	Kopili St II	Central	Unit I	25				Under long Outage		
6	Khandong HEP	Central	Unit I	25						
			Unit II	25						
7	Doyang	Central	Unit I	25						
			Unit II	25	Yes	Enable	Enable			
			Unit III	25	Yes	Enable	Enable			
8	Tuirial HEP	Central	Unit I	30	Yes	Enable	Enable			
			Unit II	30	Yes	Enable	Enable			
9	Loktak HEP	Central	Unit I	35	Yes	Enable	Enable			
			Unit II	35	Yes	Enable	Enable			
			Unit III	35	Yes	Enable	Enable			
10	Palatana GBPP	Central	Unit I	363.3	Yes	Enable	Enable			
			Unit II	363.3	Yes	Enable	Enable			

11	BgTPP	Central	Unit I	250	Yes	Enable	Enable
			Unit II	250	Yes	Enable	Enable
			Unit III	250	Yes	Enable	Enable
12	Karbi Langpi HEP	State	Unit I	50	Yes	Enable	Disable
			Unit II	50	Yes	Enable	Disable
13	Umiam St II HEP	State	Unit I	10	Yes	Enable	Enable
			Unit II	10	Yes	Enable	Enable
14	Umiam St III HEP	State	Unit I	30	Yes	Enable	Enable
			Unit II	30	Yes	Enable	Enable
15	Umiam St IV HEP	State	Unit I	30	Yes	Enable	Enable
			Unit II	30	Yes	Enable	Enable
16	Leshka	State	Unit I	42	Yes	Enable	Enable
			Unit II	42	Yes	Enable	Enable
			Unit III	42	Yes	Enable	Enable



**Format for submission of status of RGMO and FGMO by SRPC**

Sr. No.	Name of Generating Station	Sector(Stat e/Centre/ Pvt)	Unit No. of Generating Station	Capacity (MW) of Unit No. of Generating Station	Status of RGMO		Enable/Disable status of FGMO
					Availability of RGMO (Yes/No)	Enable/Disable status of RGMO	
1	NTPC Ramagundam	Centre	Unit I	200			Enabled
			Unit II	200			Enabled
			Unit III	200			Enabled
			Unit IV	500	Yes	Enabled	
			Unit V	500	Yes	Enabled	
			Unit VI	500	Yes	Enabled	
			Unit VII	500	Yes	Enabled	
2	NTPC Simhadri	Centre	Unit I	500	Yes	Enabled	
			Unit II	500	Yes	Enabled	
			Unit III	500	Yes	Enabled	
			Unit IV	500	Yes	Enabled	
3	NTPC Kudgi	Centre	Unit I	800	Yes	Enabled	
			Unit II	800	Yes	Enabled	
			Unit III	800	Yes	Enabled	
4	NTPC Talcher	Centre	Unit III	500	Yes	Enabled	
			Unit IV	500	Yes	Enabled	
			Unit V	500	Yes	Enabled	
			Unit VI	500	Yes	Enabled	
5	Neyveli TS II	Centre	Unit I	210			Enabled
			Unit II	210			Enabled
			Unit III	210			Enabled
			Unit IV	210	Yes	Enabled	
			Unit V	210	Yes	Enabled	
			Unit VI	210	Yes	Enabled	
			Unit VII	210	Yes	Enabled	
6	Neyveli TS I Expn	Centre	Unit I	210	Yes	Enabled	
			Unit II	210	Yes	Enabled	
7	Neyveli TS II Expn	Centre	Unit I	250	Yes	Enabled	
			Unit II	250	Yes	Enabled	
8	NNTPP	Centre	Unit I	500	Yes	Enabled	
			Unit II	500	Yes	Enabled	
9	NTECL Vallur	Centre	Unit I	500	Yes	Enabled	
			Unit II	500	Yes	Enabled	
			Unit III	500	Yes	Enabled	
10	NTPL	Centre	Unit I	500	Yes	Enabled	
			Unit II	500	Yes	Enabled	

11	TPCIL (SEIL P-I)	ISTS conn IPP	Unit I	660	Yes	Enabled	
			Unit II	660	Yes	Enabled	
12	SGPL (SEIL P-II)	ISTS conn IPP	Unit I	660	Yes	Enabled	
			Unit II	660	Yes	Enabled	
13	CEPL	ISTS conn IPP	Unit I	600	Yes	Enabled	
			Unit II	600	Yes	Enabled	
14	IL&FS	ISTS conn IPP	Unit I	600	Yes	Enabled	
			Unit II	600	Yes	Enabled	
15	Vijaywada TPS (Dr. NTPS)	AP	Unit I	210			Enabled
			Unit II	210			Enabled
			Unit III	210	Yes	Enabled	
			Unit IV	210	Yes	Enabled	
			Unit V	210	Yes	Enabled	
			Unit VI	210	Yes	Enabled	
			Unit VII	500	Yes	Enabled	
16	Rayalseema TPS	AP	Unit I	210	Yes	Enabled	
			Unit II	210	Yes	Enabled	
			Unit III	210	Yes	Enabled	
			Unit IV	210	Yes	Enabled	
			Unit V	210	Yes	Enabled	
			Unit VI	600	Yes	Enabled	
17	SDSTPS	AP	Unit I	800	Yes	Enabled	
			Unit II	800	Yes	Enabled	
18	HNPCl	AP IPP	Unit I	520	Yes	Enabled	
			Unit II	520	Yes	Enabled	
19	Upper Sileru	AP	Unit I	60			Enabled
			Unit II	60			Enabled
			Unit III	60			Enabled
			Unit IV	60			Enabled
20	Lower Sileru	AP	Unit I	115			Enabled
			Unit II	115			Enabled
			Unit III	115			Enabled
			Unit IV	115			Enabled
21	Donkarayi	AP	Unit I	25	Exemption		
22	Machkund	AP	Unit I	23	Exemption		
			Unit II	23	Exemption		
			Unit III	23	Exemption		
			Unit IV	17	Exemption		
			Unit V	17	Exemption		
			Unit VI	17	Exemption		
23	N'Sagar RCPH	AP	Unit I	30	Exemption		

			Unit II	30	Exemption		
			Unit III	30	Exemption		
24	Srisailam RB	AP	Unit I	110	Yes	Enabled	
			Unit II	110	Yes	Enabled	
			Unit III	110	Yes	Enabled	
			Unit IV	110	Yes	Enabled	
			Unit V	110	Yes	Enabled	
			Unit VI	110	Yes	Enabled	
			Unit VII	110	Yes	Enabled	
25	PennaAhobilam	AP	Unit I	10	Exemption		
			Unit II	10	Exemption		
26	Kakatiya TPP	TS	Unit I	500	Yes	Enabled	
			Unit II	600	Yes	Enabled	
27	Kothagudem TPS	TS	Unit IX	250	Yes	Enabled	
			Unit X	250	Yes	Enabled	
			Unit XI	500	Yes	Enabled	
			Unit XII	800	Yes	Enabled	
28	Bhadradri TPS	TS	Unit I	270	Yes	Enabled	
			Unit II	270	Yes	Enabled	
			Unit III	270	Yes	Enabled	
			Unit IV	270	Yes	Enabled	
29	Singareni TPS	TS IPP	Unit I	600	Yes	Enabled	
			Unit II	600	Yes	Enabled	
30	Nagarjunasagar	TS	Unit I	110			Enabled
			Unit II	100.8			Enabled
			Unit III	100.8			Enabled
			Unit IV	100.8			Enabled
			Unit V	100.8			Enabled
			Unit VI	100.8			Enabled
			Unit VII	100.8			Enabled
			Unit VIII	100.8			Enabled
31	N'Sagar LCPH	TS	Unit I	30	Exemption		
			Unit II	30	Exemption		
32	Priyadarshini Jurala	TS	Unit I	39			Enabled
			Unit II	39			Enabled

			Unit III	39			Enabled
			Unit IV	39			Enabled
			Unit V	39			Enabled
			Unit VI	39			Enabled
33	Srisailem LB	TS	Unit I	150			Enabled
			Unit II	150			Enabled
			Unit III	150			Enabled
			Unit IV	150			Enabled
			Unit V	150			Enabled
			Unit VI	150			Enabled
34	Bellary TPS	KA	Unit I	500	Yes	Enabled	
			Unit II	500	Yes	Enabled	
			Unit III	700	Yes	Enabled	
35	Raichur TPS	KA	Unit I	210	Yes	Enabled	
			Unit II	210	Yes	Enabled	
			Unit III	210	Yes	Enabled	
			Unit IV	210	Yes	Enabled	
			Unit V	210	Yes	Enabled	
			Unit VI	210	Yes	Enabled	
			Unit VII	210	Yes	Enabled	
			Unit VIII	250	Yes	Enabled	
36	YTPS	KA	Unit I	800	Yes	Enabled	
			Unit II	800	Yes	Enabled	
37	UPCL	KA IPP	Unit I	600	Yes	Enabled	
			Unit II	600	Yes	Enabled	
38	Jindal	KA IPP	Unit I	300	Yes	Enabled	
			Unit II	300	Yes	Enabled	
			Unit III	300	Yes	Enabled	
			Unit IV	300	Yes	Enabled	
39	Almatty	KA	Unit I	15	Yes	Enabled	
			Unit II	55	Yes	Enabled	
			Unit III	55	Yes	Enabled	
			Unit IV	55	Yes	Enabled	
			Unit V	55	Yes	Enabled	
			Unit VI	55	Yes	Enabled	
40	Bhadra	KA	Unit I	12.1			Enabled
			Unit II	12.1			Enabled
41	Ghataprabha	KA	Unit I	16	Yes	Enabled	
			Unit II	16	Yes	Enabled	
42	Jog ( MGHES )	KA	Unit I	21.6			Enabled



			Unit II	21.6			Enabled
			Unit III	21.6			Enabled
			Unit IV	21.6			Enabled
			Unit V	13.2			Enabled
			Unit VI	13.2			Enabled
			Unit VII	13.2			Enabled
			Unit VIII	13.2			Enabled
43	Kadra	KA	Unit I	50			Enabled
			Unit II	50			Enabled
			Unit III	50			Enabled
44	Kodasalli	KA	Unit I	40			Enabled
			Unit II	40			Enabled
			Unit III	40			Enabled
45	Linganamak ki Dam PH	KA	Unit I	28	Yes	Enabled	
			Unit II	28	Yes	Enabled	
46	Munirabad	KA	Unit I	10	Yes	Enabled	
47	Nagjari	KA	Unit I	150	Yes	Enabled	
			Unit II	150	Yes	Enabled	
			Unit III	150	Yes	Enabled	
			Unit IV	150	Yes	Enabled	
			Unit V	150			Enabled
			Unit VI	135			Enabled
48	Sharavati	KA	Unit I	103.5	Yes	Enabled	
			Unit II	103.5	Yes	Enabled	
			Unit III	103.5	Yes	Enabled	
			Unit IV	103.5	Yes	Enabled	
			Unit V	103.5	Yes	Enabled	
			Unit VI	103.5			Enabled
			Unit VII	103.5			Enabled
			Unit VIII	103.5			Enabled
			Unit IX	103.5			Enabled
			Unit X	103.5			Enabled
49	Sharavati Tail Race	KA	Unit I	60	Yes	Enabled	
			Unit II	60	Yes	Enabled	
			Unit III	60			Enabled
			Unit IV	60			Enabled
50	Supa	KA	Unit I	50			Enabled
			Unit II	50			Enabled
51	Varahi UGPH	KA	Unit I	115	Yes	Enabled	
			Unit II	115	Yes	Enabled	
			Unit III	115	Yes	Enabled	

			Unit IV	115	Yes	Enabled	
52	Iddukki	KL	Unit I	130			Enabled
			Unit II	130			Enabled
			Unit III	130			Enabled
			Unit IV	130			Enabled
			Unit V	130			Enabled
			Unit VI	130			Enabled
53	Idamalayar	KL	Unit I	38	Yes	Enabled	
			Unit II	38	Yes	Enabled	
54	Kakkad	KL	Unit I	25	LOCKED		
			Unit II	25	LOCKED		
55	Kuttiyadi	KL	Unit I	25	LOCKED		
			Unit II	25	LOCKED		
			Unit III	25	LOCKED		
56	Kuttiyadi Extension	KL	Unit I	50			Enabled
57	Kuttiadi Addl Extn	KL	Unit I	50			Enabled
			Unit II	50			Enabled
58	Lower Periyar	KL	Unit I	60			Enabled
			Unit II	60			Enabled
			Unit III	60			Enabled
59	Neriamangalam	KL	Unit I	18			Enabled
			Unit II	18			Enabled
			Unit III	18			Enabled
60	NES	KL	Unit I	25			Enabled
61	Panniar	KL	Unit I	15			Enabled
			Unit II	15			Enabled
62	Poringalkuthu LBE	KL	Unit I	16	LOCKED		
63	Sabarigiri	KL	Unit I	55	LOCKED		
			Unit II	55	LOCKED		
			Unit III	55	LOCKED		
			Unit IV	60			Enabled
			Unit V	55	LOCKED		
			Unit VI	60	LOCKED		
64	Sengulam	KL	Unit I	12	LOCKED		
			Unit II	12	LOCKED		
			Unit III	12	LOCKED		
			Unit IV	12	LOCKED		

65	Sholayar	KL	Unit I	18			Enabled
			Unit II	18			Enabled
			Unit III	18			Enabled
66	Mettur TPS	TN	Unit I	210			Enabled
			Unit II	210			Enabled
			Unit III	210			Enabled
			Unit IV	210			Enabled
67	METTUR ST3	TN	Unit I	600	Yes	Enabled	
68	North Chennai TPS	TN	Unit I	210	Yes	Enabled	
			Unit II	210	Yes	Enabled	
			Unit III	210	Yes	Enabled	
69	NCTPS ST2	TN	Unit I	600	Yes	Enabled	
			Unit II	600	Yes	Enabled	
70	Tuticorin	TN	Unit I	210			Enabled
			Unit II	210			Enabled
			Unit III	210			Enabled
			Unit IV	210	Yes	Enabled	
			Unit V	210	Yes	Enabled	
71	STCMS	TN IPP	Unit I	250	Yes	Enabled	
72	SEPC	TN IPP	Unit I	525	Yes	Enabled	
73	Aliyar	TN	Unit I	60	Yes	Enabled	
74	Bhavani	TN	Unit I	15			Enabled
			Unit II	15			Enabled
75	Kadamparai	TN	Unit I	100			Enabled
			Unit II	100			Enabled
			Unit III	100			Enabled
			Unit IV	100			Enabled
76	Kodayar I	TN	Unit I	60	Yes	Enabled	
			Unit II	40	Yes	Enabled	
77	Kundah I	TN	Unit I	20	Yes	Enabled	
			Unit II	20	Yes	Enabled	
			Unit III	20	Yes	Enabled	
78	Kundah II	TN	Unit I	35	Yes	Enabled	
			Unit II	35	Yes	Enabled	
			Unit III	35	Yes	Enabled	
			Unit IV	35	Yes	Enabled	
			Unit V	35	Yes	Enabled	
79	Kundah III	TN	Unit I	60	Yes	Enabled	
			Unit II	60	Yes	Enabled	
			Unit III	60	Yes	Enabled	
80	Kundah IV	TN	Unit I	50	Yes	Enabled	
			Unit II	50	Yes	Enabled	

81	Kundah V	TN	Unit I	20	Yes	Enabled	
			Unit II	20	Yes	Enabled	
82	Kundah VI	TN	Unit I	30	Yes	Enabled	
83	Lower Mettur HEP I	TN	Unit I	15			Enabled
			Unit II	15			Enabled
84	Lower Mettur HEP II	TN	Unit I	15			Enabled
			Unit II	15			Enabled
85	Lower Mettur HEP III	TN	Unit I	15			Enabled
			Unit II	15			Enabled
86	Lower Mettur HEP IV	TN	Unit I	15			Enabled
			Unit II	15			Enabled
87	Mettur Dam	TN	Unit I	10			Enabled
			Unit II	10			Enabled
			Unit III	10			Enabled
			Unit IV	10			Enabled
88	Mettur Tunnel	TN	Unit I	50			Enabled
			Unit II	50			Enabled
			Unit III	50			Enabled
			Unit IV	50			Enabled
89	Moyar	TN	Unit I	12	Yes	Enabled	
			Unit II	12	Yes	Enabled	
			Unit III	12	Yes	Enabled	
90	Parson's valley	TN	Unit I	30			Enabled
91	Periyar	TN	Unit I	35	Yes	Enabled	
			Unit II	35	Yes	Enabled	
			Unit III	35	Yes	Enabled	
			Unit IV	35			Enabled
92	PUSHEP	TN	Unit I	50	Yes	Enabled	
			Unit II	50	Yes	Enabled	
			Unit III	50	Yes	Enabled	
93	Pykara	TN	Unit I	11	Yes	Enabled	
			Unit II	14	Yes	Enabled	
			Unit III	14	Yes	Enabled	
94	Sarkarpathy	TN	Unit I	30			Enabled
95	Servalar	TN	Unit I	20			Enabled
96	Sholayar I	TN	Unit I	35			Enabled



			<b>Unit II</b>	35			Enabled
			<b>Unit III</b>	25			Enabled
<b>97</b>	Suruliyar	TN	<b>Unit I</b>	35	Yes	Enabled	

**Relevant IEGC regulation:**

1. Regulation 5.2 (f):

All thermal generating units of 200 MW and above and all hydro units of 10 MW and above, which are synchronized with the grid, irrespective of their ownership, shall have their governors in operation at all times in accordance with the following provisions:

**Governor Action**

i) Following Thermal and hydro (except those with upto three hours pondage) generating units shall be operated under restricted governor mode of operation with effect from the date given below:

a) Thermal generating units of 200 MW and above,

1) Software based Electro Hydraulic Governor (EHG) system : 01.08.2010

2) Hardware based EHG system : 01.08.2010

b) Hydro units of 10 MW and above : 01.08.2010

2. First amendment to IEGC, 2010

After clause (iii) of sub-regulation (f) of Regulation 5.2 of Principal Regulations, following proviso shall be inserted.

“Provided that if a generating unit cannot be operated under restricted governor mode operation, then it shall be operated in free governor mode operation with manual intervention to operate in the manner required under restricted governor mode operation.”



**Name of Region : EASTERN REGION**

Sl. No.	Details of stations/Units							Status of RGMO	
	Name of State	Type	Name of Utility	Sector (CS/SS/PS)	Name of Station	Name of Stage/ Unit	Installed capacity (MW)	Availability of RGMO (Yes/No)	Enable/Disable status of RGMO
1	JHARKHAND	Thermal	TVNL	SS	Tenughat	1	210	Yes	Enabled
2				SS		2	210	No	RGMO with manual intervention
3		Hydro	JSEB	SS	Subarnrekha	1	65	Status not available	
4				SS		2	65		
5	West Bengal	Thermal	WBPDC	SS	Bandel TPS	4	60.0	NA	NA
6				SS		5	215.0	Yes	Enabled
7				SS	Santalidih	5	250	Yes	Enabled
8				SS		6	250	Yes	Enabled
9				SS	Kolaghat	3	210	No	No
10				SS		4	210	No	No
11				SS		5	210	No	No
12				SS		6	210	No	No
13				SS	Bakreshwar	1	210	Yes	Enabled
14				SS		2	210	Yes	Enabled
15				SS		3	210	Yes	Enabled
16				SS		4	210	Yes	Enabled
17				SS		5	210	Yes	Enabled
18				SS	Sagardighi	1	300	Yes	Enabled
19				SS		2	300	Yes	Enabled
20				SS		3	500	Yes	Enabled
21				SS		4	500	Yes	Enabled
22		Hydro	WBS&DCL	SS	Raman Hydel	1	12.5	NA	NA
23				SS		2	12.5	NA	NA
24				SS		3	12.5	NA	NA
25				SS		4	12.5	NA	NA
26				SS	PPSP	1	225	No	No
27				SS		2	225	No	No
28				SS		3	225	No	No
29				SS		4	225	No	No
30		Thermal	CESC	SS	Budge-Budge	1	250	Yes	Enabled
31				SS		2	250	Yes	Enabled
32				SS		3	250	Yes	Enabled
33				SS	Southern	1	67.50	NA	NA
34				SS		2	67.50	NA	NA
35				SS	Titagarh	1	60	NA	NA
36				SS		2	60	NA	NA
37				SS		3	60	NA	NA
38				SS		4	60	NA	NA
39				SS	Haldia	1	300	Yes	Enabled
40				SS		2	300	Yes	Enabled
41		Thermal	DPL	SS	DPL	7	250	Yes	Enabled
42				SS		8	300	Yes	Enabled
43				SS	IR TPS-I	1	210	Yes	Enabled

44	Orissa	Hydro	OPGC	SS	IB TPS-II	2	210	Yes	Enabled
45				SS		1	660	Yes	Enabled
46				SS		2	660	Yes	Enabled
47			OHPC	SS	Burla	1	49.5	No	No
48				SS		2	49.5	No	No
49				SS		3	32	No	No
50				SS		4	32	No	No
51				SS		5	43.65	No	No
52				SS		6	43.65	No	No
53				SS		7	43.65	No	No
54				SS	Chiplima	1	24	NA	NA
55				SS		2	24	NA	NA
56				SS		3	24	NA	NA
57				SS	Balimela	1	60	No	FGMO with manual
58				SS		2	60	No	FGMO with manual
59				SS		3	60	No	FGMO with manual
60				SS		4	60	No	FGMO with manual
61				SS		5	60	No	FGMO with manual
62				SS		6	60	No	FGMO with manual
63				SS		7	75	No	FGMO with manual
64				SS		8	75	No	FGMO with manual
65				SS	Rengali	1	50	No	FGMO with manual
66				SS		2	50	No	FGMO with manual
67				SS		3	50	No	FGMO with manual
68				SS		4	50	No	FGMO with manual
69				SS		5	50	No	FGMO with manual
70				SS	Upper Kolab	1	80	No	FGMO with manual
71				SS		2	80	No	FGMO with manual
72				SS		3	80	No	FGMO with manual
73				SS		4	80	No	FGMO with manual
74				SS	Indravati	1	150	No	FGMO with manual
75				SS		2	150	No	FGMO with manual
76				SS		3	150	No	FGMO with manual
77				SS		4	150	No	FGMO with manual

78		Thermal	DVC	CS	Chandrapura	7	250	Yes	Enabled
79				CS		8	250	Yes	Enabled
80				CS	WARIA	4	210	Yes	Enabled
81				CS	Mejia - A	1	210	Yes	Enabled
82				CS		2	210	Yes	Enabled
83				CS		3	210	Yes	Enabled
84				CS		4	210	Yes	Enabled
85				CS		5	250	Yes	Enabled
86				CS		6	250	Yes	Enabled
87				CS	Mejia - B	7	500	Yes	Enabled
88				CS		8	500	Yes	Enabled
89				CS	DSTPS	1	500	Yes	Enabled



90	Central Sector			CS	KODERMA	2	500	Yes	Enabled		
91				CS		1	500	Yes	Enabled		
92				CS		2	500	Yes	Enabled		
93				CS	RAGHUNATHPUR TPS (U# 1&2)	1	600	Yes	Enabled		
94				CS		2	600	Yes	Enabled		
95				CS	BOKARO "A" TPS (U#1)	1	500	Yes	Enabled		
96				Hydro		CS	Mailhon	1	20	NA	NA
97						CS		2	20	NA	NA
98						CS		3	23.2	NA	NA
99						CS	Panchet	1	40	Status not available	
100						CS		2	40		
101		Thermal	NTPC	CS	Farakka STPP-I	1	200	Yes	Enabled		
102				CS		2	200	Yes	Enabled		
103				CS		3	200	Yes	Enabled		
104				CS	Farakka STPP-II	4	500	Yes	Enabled		
105				CS		5	500	Yes	Enabled		
106				CS	Farakka-III	6	500	Yes	Enabled		
107				CS	Kahalgoan STPP-I	1	210	Yes	Enabled		
108				CS		2	210	Yes	Enabled		
109				CS		3	210	Yes	Enabled		
110				CS		4	210	Yes	Enabled		
111				CS	Kahalgoan STPP-II	5	500	Yes	Enabled		
112				CS		6	500	Yes	Enabled		
113				CS		7	500	Yes	Enabled		
114				CS	Talcher STPP Stg-I	1	500	Yes	Enabled		
115				CS		2	500	Yes	Enabled		
116				CS	Barh St-I	1	660	Yes	Enabled		
117				CS	Barh St-II	4	660	Yes	Enabled		
118				CS		5	660	Yes	Enabled		
119				CS	KBUNL	1	195	NA	NA		
120				CS		2	195	NA	NA		
121				CS	BRBCL	1	250	Yes	Enabled		
122				CS		2	250	Yes	Enabled		
123				CS		3	250	Yes	Enabled		
124				CS	NPGCL	1	660	Yes	Enabled		
125				CS		2	660	Yes	Enabled		
126				CS		3	660	Yes	Enabled		
127				CS	Darlipali	1	800	Yes	Enabled		
128				CS		2	800	Yes	Enabled		
129				CS	Barauni TPS	6	110	NA	NA		
130				CS		7	110	NA	NA		
131				CS		8	250	Yes	Enabled		
132				CS		9	250	Yes	Enabled		
135				CS	Rangit	1	20	NA	NA		
136				CS		2	20	NA	NA		
137				CS		3	20	NA	NA		
138				CS	Teesta HEP	1	170	Yes	Enabled		
139				CS		2	170	Yes	Enabled		
140				CS		3	170	Yes	Enabled		

141	Hydro	NHPC	CS	TLDP-III	1	33	Status not available
142			CS		2	33	
143			CS		3	33	
144			CS		4	33	
145			CS	TLDP-IV	1	40	
146			CS		2	40	
147			CS		3	40	
148			CS		4	40	

149	IPP	Thermal	IPP	PS	Maithon RB TPP	1	525	Yes	Enabled
150				PS		2	525	Yes	Enabled
151				PS	Sterlite	1	600	Yes	Enabled
152				PS		2	600	Yes	Enabled
153				PS		3	600	Yes	Enabled
154				PS		4	600	Yes	Enabled
155				PS	Adhunik Power	1	270	Yes	Enabled
156				PS		2	270	Yes	Enabled
157				PS	GMR	1	350	Yes	Enabled
158				PS		2	350	Yes	Enabled
159				PS	JITPL	1	600	Yes	Enabled
160				PS		2	600	Yes	Enabled
161				PS	Jojobera TPP	1	120	NA	NA
162				PS		2	120	NA	NA
163		Hydro	IPP	PS	JLHEP	1	48	No	No
164				PS		2	48	No	No
165				PS	Chujachen HEP	1	49.5	No	No
166				PS		2	49.5	No	No
167				PS	TUL	1	200	Yes	Enabled
168				PS		2	200	Yes	Enabled
169				PS		3	200	Yes	Enabled
170				PS		4	200	Yes	Enabled
171				PS		5	200	Yes	Enabled
172				PS		6	200	Yes	Enabled
173				PS	Dikchu	1	48	Yes	Enabled
174				PS		2	48	Yes	Enabled
175				PS	Tashiding	1	49	No	No
176				PS		2	49	No	No
177				PS	Rongnichu	1	56.5	No	No
178				PS		2	56.5	No	No



[illegible][illegible]



[illegible]



# FGMO/RGMO status of generating units by NRPC.

S.No.	Station	Unit No.	Fuel Type	Installed Capacity (MW)	Status of RGMO			Enable/Disable status of FGMO	Remark
					Geographical Region (State)	Availability of RGMO (Yes/No)	Enable/Disable status of RGMO		
A. NTPC Ltd									
1	Anta GPS	GT#1	Gas	88.71	Rajasthan				Details not received yet
		GT#2		88.71					
		GT#3		88.71					
		ST#1		153.2					
2	Auraiya GPS	GT#1	Gas	111.19	Uttar Pradesh				Details not received yet
		GT#2		111.19					
		GT#3		111.19					
		GT#4		111.19					
		ST#1		109.3					
		ST#2		109.3					
4	Dadri NTPC	1	Thermal	210	Delhi-NCR	Yes	Enabled		
		2		210		Yes	Enabled		
		3		210		Yes	Enabled		
		4		210		Yes	Enabled		
5	Dadri NTPC	1	Thermal	490	Delhi-NCR	Yes	Enabled		
		2		490		Yes	Enabled		
8	Dadri GPS	GT#1	Gas	130.19	Delhi-NCR				Details not received yet
		GT#2		130.19					
		GT#3		130.19					
		GT#4		130.19					
		ST#1		154.51					
9	Koldam	ST#2	Hydro	154.51	Himachal Pradesh				
		1		200		Yes	Enabled		
		2		200		Yes	Enabled		
		3		200		Yes	Enabled		
		4		200		Yes	Enabled		
10	Rihand TPS	1	Thermal	500	Uttar Pradesh	Yes	Enabled		
		2		500		Yes	Enabled		
		3		500		Yes	Enabled		
		4		500		Yes	Enabled		
		5		500		Yes	Enabled		
		6		500		Yes	Enabled		
11	Singrauli STPS	1	Thermal	200	Uttar Pradesh	Yes	Enabled		
		2		200		Yes	Enabled		
		3		200		Yes	Enabled		
		4		200		Yes	Enabled		
		5		200		Yes	Enabled		
		6		500		Yes	Enabled		
		7		500		Yes	Enabled		
12	Singrauli Hydro	1	Hydro	4	Uttar Pradesh	NA		As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)	
		2		4		NA			
14	Tanda TPS Stage-II	1	Thermal	660	Uttar Pradesh	Yes	Enabled		
		2		660		Yes	Enabled		
		1		210		Yes	Enabled		
		2	Thermal	210	Uttar Pradesh	Yes	Enabled		

15	Uncharhar -I,II & II TPS	1	Thermal	210	Uttar Pradesh	Yes	Enabled				
		2	Thermal	210	Uttar Pradesh	Yes	Enabled				
16	Uncharhar -IV	1	Thermal	500	Uttar Pradesh	Yes	Enabled				
B. NHPC Ltd											
1	Bairasiul	1	Hydro	60	Himachal Pradesh	NA				As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)	
		2		60		NA					
		3		60		NA					
2	Chamera HPS-I	1	Hydro	180	Himachal Pradesh	Yes	Enabled				
		2		180		Yes	Enabled				
		3		180		Yes	Enabled				
3	Chamera HPS-II	1	Hydro	100	Himachal Pradesh	NA				As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)	
		2		100		NA					
		3		100		NA					
4	Chamera HPS-III	1	Hydro	77	Himachal Pradesh	Yes	Enabled				
		2		77		Yes	Enabled				
		3		77		Yes	Enabled				
5	Dhauliganga	1	Hydro	70	Uttarakhand	Yes	Enabled				
		2		70		Yes	Enabled				
		3		70		Yes	Enabled				
		4		70		Yes	Enabled				
6	Dulhasti	1	Hydro	130	Jammu & Kashmir	NA				As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)	
		2		130		NA					
		3		130		NA					
7	Kishenganga	1	Hydro	110	Jammu & Kashmir	NA				As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)	
		2		110		NA					
		3		110		NA					
8	Parbati-2	1	Hydro	200	Himachal Pradesh					Details not received yet	
		2		200							
		3		200							
		4		200							
9	Parbati-3	1	Hydro	130	Himachal Pradesh						
		2		130							
		3		130							
		4		130							
10	Salal Stage - I & II	1	Hydro	115	Jammu & Kashmir	NA				As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)	
		2		115		NA					
		3		115		NA					
		1	Hydro	115	Jammu & Kashmir	NA				As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)	
		2		115		NA					
		3		115		NA					
11	Sewa-II	1	Hydro	40	Jammu & Kashmir	Yes					
		2		40		Yes					
		3		40		Yes					
12	Tanakpur HPS	1	Hydro	40	Uttarakhand	NA				As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)	
		2		40		NA					
		3		40		NA					
13	URI-I	1	Hydro	120	Jammu & Kashmir	NA				As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)	
		2		120		NA					
		3		120		NA					
		4		120		NA					





2	Rampur HEP	1		68.67	Himachal Pradesh	Yes	Enabled	
		2		68.67		Yes	Enabled	
		3		68.67		Yes	Enabled	
		4		68.67		Yes	Enabled	
		5		68.67		Yes	Enabled	
		6		68.67		Yes	Enabled	
H. SHREE CEMENT TPS								
1	Shree Cement	1	Thermal	150	Rajasthan			
		2		150				
I. ADHYDRO POWER LTD.								
1	AD Hydro	1	Hydro	96	Himachal Pradesh	Yes	Enabled	
		2		96		Yes	Enabled	
J. Jindal South West Energy (JSW Energy)								
1	Karcham Wangtoo	1	Hydro	250	Himachal Pradesh	Yes	Enabled	
		2		250		Yes	Enabled	
		3		250		Yes	Enabled	
		4		250		Yes	Enabled	
K. Greenko Budhil								
1	Budhil	1	Hydro	35	Himachal Pradesh			Details not received yet
		2		35				
L. Singoli Bhatwari (RENEW POWER)								
1	Singoli Bhatwari	1	Hydro	33	Uttar Pradesh			Details not received yet
2		33						
3		33						
M. Sorang HEP (Himachal Sorang Power Ltd.)								
1	Sorang	1	Hydro	50	Himachal Pradesh			Details not received yet
2		2		50				
STATE ENTITIES GENERATIO								
A. DELHI								
1	Pragati Gas Turbines	GT#1	Gas	104.6	Delhi-NCR			
		GT#2		104.6				
		ST#1		121.2				
2	Bawana CCGT	GT#1	216					
		GT#2	216					
		GT#3	216					
		GT#4	216					
		ST#1	253.6					
		ST#2	253.6					
3	I.P. CCPP (Pragati Gas)	GT#1	30					
		GT#2	30					
		GT#3	30					
		GT#4	30					
		GT#5	30					
		GT#6	30					
		ST#1	34					
		ST#2	34					
		ST#3	34					
		GT#1	36					
4	Rithala GPS	GT#2	Gas	36				
		GT#3		36				
B. Haryana								
1	Panipat -I & II	2	Thermal	210				
		3	Thermal	250				
		4	Thermal	250				



Punjab															
Sl. No.	Project Name	Capacity (MW)						State	Type	Year of Commissioning	Status	Remarks			
		1	2	3	4	5	6								
5	ANANDPUR SAHIB-I HPS	1	2	3	4	5	6	Punjab	Hydro	150			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)		
										150					
										33.5					
										33.5					
6	MUKERIAN-I HPS	1	2	3	4	5	6	Punjab	Hydro	15			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)		
										15					
										15					
										15					
	MUKERIAN-II HPS	1	2	3	4	5	6		Punjab	Hydro	15			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)	
											15				
											15				
											15				
	MUKERIAN-III HPS	1	2	3	4	5	6			Punjab	Hydro	19.5			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)
												19.5			
												19.5			
												19.5			
MUKERIAN-IV HPS	1	2	3	4	5	6	Punjab	Hydro			19.5			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)	
											19.5				
											19.5				
											9				
7	SHANAN HPS	1	2	3	4	5		6	Punjab		Hydro	15			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)
												15			
												15			
												15			
										15					
										50					
										660		Yes	Enabled		
										660		Yes	Enabled		
								660		Yes		Enabled			
								700		Yes		Enabled			
								700		Yes		Enabled			
		8	Talwandi Saboo	1	2	3	4	5		6		Punjab	Thermal	15	
								15							
								15							
								15							
								15							
								15							
								15							
								15							
								15							
								15							
								15							
								15							
9	Rajpura TPS	1	2	3	4	5	6	Punjab	Thermal	15			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)		
										15					
										15					
										15					
										15					
										15					
										15					
										15					
										15					
										15					
										15					
										15					
10	Upper Bari Doab Canal (UBDC) Hydroelectric Project	1	2	3	4	5	6	Punjab	Hydro	125			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)		
										125					
										250	Yes	Enabled			
										250	Yes	Enabled			
										250	Yes	Enabled			
										250	Yes	Enabled			
										660					
										660					
										110					
										110					
										110					
										110					
F. Rajasthan	Barsingsar	1	2	3	4	5	6	Rajasthan	Lignite	125			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)		
										125					
										250	Yes	Enabled			
										250	Yes	Enabled			
										250	Yes	Enabled			
										250	Yes	Enabled			
										660					
										660					
										110					
										110					
										110					
										110					
Chhabra Stage-I	1	2	3	4	5	6	Rajasthan	Thermal	125			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)			
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
Chhabra Stage-2	1	2	3	4	5	6	Rajasthan	Thermal	125			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)			
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
Chhabra Supercritical	1	2	3	4	5	6	Rajasthan	Thermal	125			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)			
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
Dholpur CCPP	1	2	3	4	5	6	Rajasthan	Gas	125			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)			
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
Giraj LTSP	1	2	3	4	5	6	Rajasthan	Lignite	125			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)			
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
Kota TPS	1	2	3	4	5	6	Rajasthan	Thermal	125			As reported , RGMO is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)			
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						
									125						

Details not received yet



[illegible]



2	CHILLA HPS	2	Hydro	36	Uttarakhand					As reported , RGM0 is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)
		3		36						
		4		36						
		1		30						
3	KHODRI HPS	2	Hydro	30	Uttarakhand					As reported , RGM0 is not applicable as per IEGC clause 5.2 (f), 5.2 (g), 5.2 (h) and ,5.2(i)
		3		30						
		4		30						
		1		76						
4	MANERI BHALI - II HPS	2	Hydro	76	Uttarakhand					Details not received yet
		3		76						
		4		76						
		1		75						
6	Kashipur	2	Gas	75	Uttarakhand					
		3		75						
		3		75						





# पावर सिस्टम ऑपरेशन कॉर्पोरेशन लिमिटेड

(भारत सरकार का उद्यम)

## POWER SYSTEM OPERATION CORPORATION LIMITED

(A Govt. of India Enterprise)



केन्द्रीय कार्यालय : 61, आई एफ सी आई टावर, 7,8 एवं 9वीं मंजिल, नेहरु प्लेस, नई दिल्ली - 110019  
Corporate Office : 61, IFCI Tower, 7,8 & 9th Floor, Nehru Place, New Delhi- 110019  
CIN : U40105DL2009GOI188682, Website : www.posoco.in, E-mail : posococc@posoco.in, Tel.: 011- 40234672

Ref: POSOCO/NLDC/Primary Response/

Date: 15<sup>th</sup> May 2020

To,  
Secretary  
Central Electricity Regulatory Commission  
3<sup>rd</sup> & 4<sup>th</sup> Floor, Chanderlok Building,  
36, Janpath, New Delhi- 110001

### Sub: Testing of primary frequency response of generators as per IEGC clause 5.2(g)

#### Reference:

1. Indian Electricity Grid Code (Fifth Amendment) Regulations, 2017 dated 12th April 2017 .
2. POSOCO Communication dated 12th Oct 2018

Dear Sir,

The Hon'ble Central Electricity Regulatory Commission (CERC), vide notification dated 12th April 2017, had notified Indian Electricity Grid Code (Fifth Amendment) Regulations, 2017. As per this notification the following proviso is added at the end of Regulation 5.2 (g) of Part 5 of the Principal Indian Electricity Grid Code (IEGC) Regulations:

*"Provided that periodic checkups by third party should be conducted at regular interval once in two years through independent agencies selected by RLDCs or SLDCs as the case may be. The cost of such tests shall be recovered by the RLDCs or SLDCs from the Generators. If deemed necessary by RLDCs/SLDCs, the test may be conducted more than once in two years."*

In compliance of the regulation mentioned above, POSOCO formulated a procedure to carry out the testing of primary response, the details of which were informed to Hon'ble Commission vide POSOCO communication dated 12<sup>th</sup> Oct 2018. The copy of communication is enclosed as Annexe-1. POSOCO completed bidding process to identify independent agencies and price per unit to carry out testing. The selected testing agencies have been allocated generating units as identified by POSOCO. The number of generating units allocated to testing agencies is also based on capability to carry out testing in a year which was declared by respective agency during initial stage of bidding process. The following

*Testing of primary frequency response of generators as per IEGC clause 5.2(g)*

पंजीकृत कार्यालय : प्रथम तल, बी-9, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली - 110016  
Registered Office : First Floor, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016


two agencies have been identified through tendering process and allocated generating units to carry out testing and generators have been informed accordingly by POSOCO:

S.No.	Testing Agency	Capability to carry out testing in two years	Intimation to Allocated Generator on
1	M/s Siemens Ltd.	40	22 <sup>nd</sup> Apr 2020
2	M/s Solvina India Pvt. Ltd.	200	13 <sup>th</sup> May 2020

The copy of communication informing generators in this regard is enclosed as Annexe-2 & Annexe-3 respectively. In line with the procedure mentioned at Annexe-1, the generators have been requested to directly place award to allotted testing agency at identified discovered price per unit. This is for kind information for the Hon'ble Commission and further directions, if any, in this regard.

Thanking you,

Yours faithfully,



(Debasis De)

Executive Director-NLDC

Encl.: As above

Copy to:

1. Member Secretary, NRPC/WRPC/SRPC/ERPC/NERPC
2. Executive Director, NRLDC/WRLDC/SRLDC/ERLDC/NERLDC
3. Chief Engineer, NPC, CEA

# पावर सिस्टम ऑपरेशन कॉर्पोरेशन लिमिटेड

(भारत सरकार का उद्यम)

## POWER SYSTEM OPERATION CORPORATION LIMITED

(A Govt. of India Enterprise)



पंजीकृत एवं केन्द्रीय कार्यालय : प्रथम तल, बी-9, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली-110016  
Registered & Corporate Office : 1st Floor, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016  
CIN : U40105DL2009GOI188682, Website : www.posoco.in, E-mail : posococc@posoco.in, Tel.: 011- 41035696, Fax : 011- 26536901

संदर्भ.सं.: POSOCO/NLDC/Primary Response/

दिनांक: 12<sup>th</sup> Oct 2018

सेवा में,

सचिव,  
केन्द्रीय विद्युत विनियामक आयोग,  
तीसरा तथा चौथा तल,  
चंद्रलोक भवन, 36 जनपथ,  
नई दिल्ली-110001

**विषय: Regarding: Testing of primary frequency response of generators as per IEGC clause 5.2(g)**

**संदर्भ:** Indian Electricity Grid Code (Fifth Amendment) Regulations, 2017 dated 12<sup>th</sup> April 2017

Dear Sir,

The Hon'ble Commission, vide notification dated 12th April 2017, had notified Indian Electricity Grid Code (Fifth Amendment) Regulations, 2017. As per this notification "The following proviso shall be added at the end of Regulation 5.2 (g) of Part 5 of the Principal Regulations:

"Provided that periodic checkups by third party should be conducted at regular interval once in two years through independent agencies selected by RLDCs or SLDCs as the case may be. The cost of such tests shall be recovered by the RLDCs or SLDCs from the Generators. If deemed necessary by RLDCs/SLDCs, the test may be conducted more than once in two years."

In compliance to the regulation mentioned above, National Load Despatch Centre (NLDC) on behalf of RLDCs has formulated a procedure for carrying out the primary frequency response tests. The notice inviting Expression of Interest (EOI) from interested agencies was released in leading daily newspapers of 1<sup>st</sup> October 2018 and 3<sup>rd</sup> October 2018 edition of Indian Trade Journal (ITJ). The modus operandi for carrying out tests is enclosed at Annexure. As this is the first of its kind exercise in the country, it has taken some time. This is for kind information for the Hon'ble Commission and further directions, if any, in the matter.

सधन्यवाद

भवदीय  
एस. आर. नरसिम्हन

(एस आर नरसिम्हन)  
कार्यपालक निदेशक(रा.भा.प्रे.के.)

संलग्न: उपरोक्त अनुसार

प्रतिलिपि सूचनार्थः

1. सदस्य-सचिव, उ./द./प./पू./उ.पू. क्षेत्रीय विद्युत समीति
2. कार्यपालक निदेशक, उ./द./प./पू./उ.पू. भा.प्रे.के.
3. मुख्य अभियंता (स्व. पी. सी.),

स्वहित एवं राष्ट्र हित में ऊर्जा बचाये  
Save Energy for Benefit of Self and Nation

Annexe-1( Letter with modus operandi)



## **Modus –Operandi for carrying out testing of Generators**

1. As per IEGC regulations, the tests are to be carried out by independent third party agencies to be selected by RLDCs or SLDCs and costs to be recovered by the RLDC or SLDCs from the generators. Selection of independent third party agencies separately by each RLDC would be duplication of effort. In order to have ease and uniformity in procurement, it was decided that NLDC on behalf of RLDCs would identify the parties for conducting the Primary frequency Response tests. SLDCs would either adopt the same set of parties identified by NLDC or have a separate process.
2. As per IEGC regulations, Primary frequency Response Test is required to be carried out on all generators once in two years. There are total 342 units which come under purview of RLDCs for primary frequency response and are to be tested in time period of two years. Considering that 2-3 days are required for testing on each unit, approx. 14 units are required to be tested in a month. There are few specialized agencies who can carry out Primary Response Tests. In view of the same it was decided that more than one agency is engaged to carry out the tests.
3. Shortlisted agencies who are eligible and qualified will be invited to submit price proposals. A meeting will be convened with shortlisted agencies for inputs for technical and commercial clauses for preparation of Price Proposal documents. After opening of price bids, other bidders would be offered to match the price of L1 bidder. All the bidders who match the price will also be considered along with L1 bidder for award of the contract. The price per unit will be valid for a period of 2 years after award and shall be fixed for the entire duration of contract.
4. It is to inform that at each plant, based on rating, vintage and type of generating unit would be tested. Further, based on the undertaking furnished by agency regarding time bound capability to test the generating units, the quantity of generators will be allocated by POSOCO for carrying out the tests. The testing will be conducted at site in presence of representative(s) of POSOCO.
5. As per IEGC code, costs for carrying out the tests are to be recovered by the RLDC or SLDCs from the generators. Pursuant to implementation of GST, modalities for placement of award were internally discussed. After discussion, it emerged that in GST regime, raising of invoice for testing by POSOCO and testing agencies have working implications. Further, POSOCO has no earmarked funds for making payments to testing agency (ies). In view of the same, it is proposed that Generators would pay the testing agency(ies) based on the rates and testing agency(ies) finalized by POSOCO.
6. After completion of this task the payment to the *agency* will be made by owner of generator, which will be done after approval of report on testing by POSOCO is done.
7. All miscellaneous expenses such as cost incurred on publishing EOI in the newspaper, printing, postal charges and filing etc. will be borne by POSOCO.
8. Copy of EOI documents is enclosed.



पावर सिस्टम ऑपरेशन कॉर्पोरेशन लिमिटेड  
(भारत सरकार का उद्यम)  
**POWER SYSTEM OPERATION CORPORATION LIMITED**  
(A Govt. of India Enterprise)



केन्द्रीय कार्यालय : 61, आई एफ सी आई टावर, 7,8 एवं 9वीं मंजिल, नेहरु प्लेस, नई दिल्ली -110019  
Corporate Office : 61, IFCI Tower, 7,8 & 9th Floor, Nehru Place, New Delhi- 110019  
CIN : U40105DL2009GOI188682, Website : www.posoco.in, E-mail : posococc@posoco.in, Tel.: 011- 40234672

Ref: POSOCO/NLDC/Primary Response/

Date: 22<sup>nd</sup> Apr 2020

To,

As per distribution list.

**Sub: Regarding: Testing of primary frequency response of generators as per IEGC clause 5.2(g) and informing modus-operandi to generating unit owners where testing is planned**

Reference:

1. Indian Electricity Grid Code (Fifth Amendment) Regulations, 2017 dated 12<sup>th</sup> April 2017 .
2. POSOCO Communication dated 12<sup>th</sup> Oct 2018, dated 23<sup>rd</sup> May 2019, dated 26<sup>th</sup> Jun 2019 and dated 4<sup>th</sup> Oct 2019 on the subject.

Dear Sir/Ma'am,

The Hon'ble Central Electricity Regulatory Commission (CERC), vide notification dated 12th April 2017, had notified Indian Electricity Grid Code (Fifth Amendment) Regulations, 2017. As per this notification has added following proviso at the end of Regulation 5.2 (g) of Part 5 of the Principal Indian Electricity Grid Code (IEGC) Regulations:

*"Provided that periodic checkups by third party should be conducted at regular interval once in two years through independent agencies selected by RLDCs or SLDCs as the case may be. The cost of such tests shall be recovered by the RLDCs or SLDCs from the Generators. If deemed necessary by RLDCs/SLDCs, the test may be conducted more than once in two years."*

In compliance of the regulation mentioned above, POSOCO has carried out necessary actions which were shared with all the generators from time to time. The developments in this regard are summarized below:

1. NLDC on behalf of RLDCs formulated a procedure in this regard and shared the details with generators vide letter dated 12<sup>th</sup> Oct 2018 from ED (NLDC)-POSOCO. In the letter, it was specifically mentioned that generators will directly place the

*Testing of primary frequency response of generators as per IEGC clause 5.2(g)*

Page 1 of 3

- Letter of Award(LoA) on the identified/allocated agency as per rate finalized by POSOCO. The copy of letter is enclosed at *Annexe-1*.
2. The modus-operandi in this regard was also intimated to Hon'ble CERC vide ED (NLDC)-POSOCO letter dated 12<sup>th</sup> Oct 2018. The copy of the letter is enclosed at *Annexe-2*.
  3. A meeting with all generators was organized at POSOCO-NRLDC on 6<sup>th</sup> Jun 2019 to discuss the important clauses of Request for Proposal (RfP) document for primary frequency testing. The meeting invitation was given to all generators by POSOCO and is enclosed as *Annexe-3*.
  4. The meeting on 6<sup>th</sup> Jun 2019 was attended by representatives of generators. In the meeting various clauses of RfP draft were discussed. The Minutes of Meeting (MoM) was shared with all participants vide CGM (NLDC)-POSOCO letter dated 26<sup>th</sup> Jun 2019. The copy of communication is enclosed as *Annexe-4*.
  5. The RfP was reviewed and shared with all the five agencies selected during EOI stage. The copy of RfP and EOI documents were also shared with all the generators. The generators were requested for cooperation while carrying out testing. The copy of communication dated 4<sup>th</sup> Oct 2019 from POSOCO is enclosed as *Annexe-5*.
  6. Based on above, POSOCO has identified M/s Siemens Ltd as per bidding procedure and has accepted the offer of Siemens to test 40 number of generating units at a cost of *Rupees Three Lakh Thirty One Thousand* ( excluding GST) per generating unit. The POSOCO letter to M/s Siemens Ltd in this regard and their acknowledgement is enclosed as *Annexe-6 & 7*. The other details of testing and facilities to be provided by the generating stations, would be as per RfP document. The generating units at the stations owned by your company have been selected for testing by M/s Siemens..
  7. The Request for Proposal (RfP) document, Clause 26.2 of the document, Finalisation of Award mentions *"The Agency (ies) will coordinate with generating unit owners and award will be placed directly by generating unit on Agency(ies). The Agency's representative(s) who must have written power of attorney to sign a Contract on behalf of the Agency would be invited by the Generating Companies for signing the contract based on the price and the generators allotted. The Agency is expected to commence the assignment on the date and at the location agreed."*
  8. M/s Siemens Ltd. has already been informed about the generating units allotted to them via meeting with POSOCO dated 18<sup>th</sup> Mar 2020. The copy of signed Minutes of Meeting (MoM) in this regard is enclosed as *Annexe-8*.

*Testing of primary frequency response of generators as per IEGC clause 5.2(g)*

Page 2 of 3

The general terms and condition of contract have been mentioned in Request for Proposal (RfP) document which shall be referred while finalization of award. The contact details of representatives of M/s Siemens Ltd. are given below:

S.No.	Name	Designation & Department	Email-id
1.	Sh. Puneet Goyal	GP-SD S CD-GTM	<a href="mailto:puneet.goyal@siemens.com">puneet.goyal@siemens.com</a>
2.	Sh.Karthik Shivaprasad	Head- GP-SD S CD-GTM	<a href="mailto:shivaprasad.karthik@siemens.com">shivaprasad.karthik@siemens.com</a>

It is kindly requested to coordinate with testing agency as above to carry out the envisaged testing in time. After the contract, the final schedule of testing shall be coordinated with respective RLDC/RPC and NLDC. POSOCO assures all necessary help and support in this regard.

Thanking You

Yours faithfully,

  
(Debasis De)

Executive Director-NLDC

Encl.: As above

Copy to:

1. Member Secretary, NRPC/WRPC/SRPC/ERPC/NERPC
2. Executive Director, NRLDC/WRLDC/SRLDC/ERLDC/NERLDC
3. Sh. Puneet Goyal, GP-SD S CD-GTM, M/s Siemens Ltd.

*Testing of primary frequency response of generators as per IECG clause 5.2(g)*

Page 3 of 3

## Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Siemens)

S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type(EHG/Mechanical/Others(specify))	Governor has provisions for accepting the frequency simulation signals(Y/N)
1	NR	NTPC Ltd	Rihand	1	500	Coal	BHEL	01.03.1988	EHG	YES
2	NR	NTPC Ltd	Rihand	3	500	Coal	BHEL	01.01.2005	EHG	YES
3	NR	NTPC Ltd	Rihand	4	500	Coal	BHEL	01.09.2005	EHG	YES
4	NR	NTPC Ltd	Rihand	6	500	Coal	BHEL	01.10.2013	EHG	YES
5	NR	NTPC Ltd	Koldam	1	200	Hydro	ALSTOM (France)	31.03.2015 (COD)	EHG	YES
6	NR	NTPC Ltd	Koldam	3	200	Hydro	M/s ALSTOM (France)	10.04.2015 (COD)	EHG	YES
7	NR	NTPC Ltd	Koldam	4	200	Hydro	M/s ALSTOM (France)	12.06.2015 (COD)	EHG	YES
8	NR	ADHP	AD Hydro	1	96	Hydro	BHEL	16-Sep-10	G-40, EHGC Max Dna software	YES
9	NR	ADHP	AD Hydro	2	96	Hydro	BHEL	18-Sep-10	G-40, EHGC Max Dna software	YES
10	NR	NHPC	Dhauliganga	1	70	Hydro	M/s GE Power India Limited (Formerly known as M/s Alstom Power India	Commissioned in 2006, recommissioned in 2014.	EHG	YES
11	NR	NHPC	Dhauliganga	3	70	Hydro			EHG	YES
12	NR	NHPC	Dhauliganga	4	70	Hydro			EHG	YES

**Goyal  
Puneet**

**Karthik  
Shivaprasad**

*Rahul Shukla*



## Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Siemens)

S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type(EHG/Mechanical/Others(specify))	Governor has provisions for accepting the frequency simulation signals(Y/N)
13	NR	NHPC	Sewa-2	1	40	Hydro	BHEL	2010	EHG	YES
14	NR	NHPC	Sewa-2	2	40	Hydro	BHEL	2010	EHG	YES
15	WR	NTPC Ltd	Sipat-I	2	660	Coal	Electrosila		EHG	YES
16	WR	NTPC Ltd	Sipat-II	4	500	Coal	Electrosila		EHG	YES
17	WR	NTPC Ltd	Solapur	1	660	Coal	ALSTOM	2018	EHG	YES
18	WR	NSPCL	NSPCL	1	250	Coal	BHEL	2009	EHG	YES
19	WR	NSPCL	NSPCL	2	250	Coal	BHEL	2009	EHG	YES
20	WR	Jaypee	JP-Nigrie	1	660	Coal	MITSUBISHI ELECTRIC	2011	DEH	YES
21	WR	Jaypee	JP-Nigrie	2	660	Coal	MITSUBISHI ELECTRIC	2011	DEH	YES
22	WR	Reliance Energy	Sasan_UMPP	1	660	Coal	Shanghai Electric Company	2013	EHG	YES
23	WR	Reliance Energy	Sasan_UMPP	2	660	Coal	Shanghai Electric Company	2013	EHG	YES
24	WR	Reliance Energy	Sasan_UMPP	6	660	Coal	Shanghai Electric Company	2013	EHG	YES

**Goyal  
Puneet**

Digitally signed by Goyal Puneet  
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Date: 2020.04.16 09:45:54 +05'30'

**Karthik  
Shivaprasad**

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*Rahul Shukla*

## Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Siemens)

S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type(EHG/Mechanical/Others(specify)	Governor has provisions for accepting the frequency simulation signals(Y/N)
25	SR	NTPC Ltd	SIMHADRI TPS STAGE 1	1	500	Coal	BHEL	2002	EHG	YES
26	SR	NTPC Ltd	SIMHADRI TPS STAGE 1	2	500	Coal	BHEL	2003	EHG	YES
27	SR	NTPC Ltd	SIMHADRI TPS STAGE 2	1	500	Coal	BHEL	2011	EHG	YES
28	SR	NTPC Ltd	SIMHADRI TPS STAGE 2	2	500	Coal	BHEL	2012	EHG	YES
29	SR	Coastal Energen Pvt. Ltd, Tuticorin.	COASTAL	1	600	Coal	HARBIN ELECTRIC MACHINERY COMPANY LTD	23.12.2014	EHG	YES
30	SR	Coastal Energen Pvt. Ltd, Tuticorin.	COASTAL	2	600	Coal	HARBIN ELECTRIC MACHINERY COMPANY LTD	15.01.2016	EHG	YES

Goyal  
Puneet

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Karthik  
Shivaprasad

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Rahul Shukla

## Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Siemens)

S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type(EHG/Mechanical/Others(specify))	Governor has provisions for accepting the frequency simulation signals(Y/N)
31	ER	Maithon Power Limited	Maithon RB	1	525	Coal	BHEL	2011	EHG	YES
32	ER	Maithon Power Limited	Maithon RB	2	525	Coal	BHEL	2012	EHG	YES
33	ER	GMR Kamalanga Energy Ltd.	GMR	1	350	Coal	DONGFANG	2013	EHG	YES
34	ER	GMR Kamalanga Energy Ltd.	GMR	2	350	Coal	DONGFANG	2013	EHG	YES
35	ER	Jindal India Thermal Power Limited	JITPL	1	600	Coal	BHEL	2015	EHG	YES
36	ER	Jindal India Thermal Power Limited	JITPL	2	600	Coal	BHEL	2015	EHG	YES
37	NER	NEEPCO	Doyang	1	25	HYDEL	BHEL	8-Jul-00	EHG	YES
38	NER	NEEPCO	Doyang	2	25	HYDEL	BHEL	5-Jul-00	EHG	YES
39	NER	OTPCL	Palatana	GT-I	232.39	GAS	BHEL	2010	EHG	YES
40	NER	OTPCL	Palatana	ST-I	130.91	GAS	BHEL	2010	EHG	YES

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Puneet

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Shivaprasad

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Rahul Shukla



पावर सिस्टम ऑपरेशन कॉर्पोरेशन लिमिटेड  
(भारत सरकार का उद्यम)  
**POWER SYSTEM OPERATION CORPORATION LIMITED**  
(A Govt. of India Enterprise)



पंजीकृत एवं केन्द्रीय कार्यालय : प्रथम तल, बी-9, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली-110016  
Registered & Corporate Office : 1st Floor, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016  
CIN : U40105DL2009GOI188682, Website : www.posoco.in, E-mail : posococc@posoco.in, Tel.: 011- 41035696, Fax : 011- 26536901

Ref: POSOCO/NLDC/Primary Response/

Date: 13<sup>th</sup> May 2020

To,

As per distribution list.

**Sub: Regarding: Testing of primary frequency response of generators as per IEGC clause 5.2(g) and informing modus-operandi to generating unit owners where testing is planned**

Reference:

1. Indian Electricity Grid Code (Fifth Amendment) Regulations, 2017 dated 12<sup>th</sup> April 2017 .
2. POSOCO Communication dated 12<sup>th</sup> Oct 2018, dated 23<sup>rd</sup> May 2019, dated 26<sup>th</sup> Jun 2019 and dated 4<sup>th</sup> Oct 2019 on the subject.

Dear Sir/Ma'am,

The Hon'ble Central Electricity Regulatory Commission (CERC), vide notification dated 12th April 2017, had notified Indian Electricity Grid Code (Fifth Amendment) Regulations, 2017. As per this notification, following proviso has been added at the end of Regulation 5.2 (g) of Part 5 of the Principal Indian Electricity Grid Code (IEGC) Regulations:

*"Provided that periodic checkups by third party should be conducted at regular interval once in two years through independent agencies selected by RLDCs or SLDCs as the case may be. The cost of such tests shall be recovered by the RLDCs or SLDCs from the Generators. If deemed necessary by RLDCs/SLDCs, the test may be conducted more than once in two years."*

In compliance of the regulation mentioned above, POSOCO has carried out necessary actions which were shared with all the generators from time to time. The developments in this regard are summarized below:

1. NLDC on behalf of RLDCs formulated a procedure in this regard and shared the details with generators vide letter dated 12<sup>th</sup> Oct 2018 from ED (NLDC)-POSOCO. In the letter, it was specifically mentioned that generators will directly place the Letter of Award(LoA) on the identified/allocated agency as per rate finalized by POSOCO. The copy of letter is enclosed at *Annexe-1*.
2. The modus-operandi in this regard was also intimated to Hon'ble CERC vide ED (NLDC)-POSOCO letter dated 12<sup>th</sup> Oct 2018. The copy of the letter is enclosed at *Annexe-2*.
3. A meeting with all generators was organized at POSOCO-NRLDC on 6<sup>th</sup> Jun 2019 to discuss the important clauses of Request for Proposal (RfP) document for primary frequency testing. The meeting invitation was given to all generators by POSOCO and is enclosed as *Annexe-3*. The meeting was attended by representatives of generators. In the meeting various clauses of RfP draft were discussed. The Minutes of Meeting (MoM) was shared with all participants vide CGM (NLDC)-POSOCO letter dated 26<sup>th</sup> Jun 2019. The copy of communication is enclosed as *Annexe-4*.
4. The RfP was reviewed and shared with all the five agencies selected during EOI stage. The copy of RfP and EOI documents were also shared with all the generators. The generators were requested for cooperation while carrying out testing. The copy of communication dated 4<sup>th</sup> Oct 2019 from POSOCO is enclosed as *Annexe-5*.

*Testing of primary frequency response of generators as per IEGC clause 5.2(g)*

Page 1 of 2



5. Based on above, POSOCO has identified M/s Solvina India Pvt. Ltd.(Solvina) as per bidding procedure and has accepted the offer of Solvina to test 200 number of generating units at a cost of *Rupees Three Lakh Thirty One Thousand* ( excluding GST) per generating unit. The POSOCO letter to M/s Solvina India Pvt. Ltd. in this regard and their acknowledgement is enclosed as *Annexe-6 & Annexe-7* respectively. The other details of testing and facilities to be provided by the generating stations, would be as per RfP document. The generating units at the stations owned by your company have been selected for testing by M/s Solvina India Pvt. Ltd.
6. The Request for Proposal (RfP) document, Clause 26.2 of the document, it is mentioned that *"The Agency (ies) will coordinate with generating unit owners and award will be placed directly by generating unit on Agency(ies). The Agency's representative(s) who must have written power of attorney to sign a Contract on behalf of the Agency would be invited by the Generating Companies for signing the contract based on the price and the generators allotted. The Agency is expected to commence the assignment on the date and at the location agreed."* Accordingly, Generating Agencies are to place award for the testing activity.
7. M/s Solvina India Pvt. Ltd. has already been informed about the generating units allotted to them via meeting with POSOCO dated 27<sup>th</sup> Apr 2020. The copy of signed Minutes of Meeting (MoM) in this regard is enclosed as *Annexe-8*.  
The general terms and condition of contract have been mentioned in Request for Proposal (RfP) document which shall be referred while finalization of award.

The contact details of representatives of M/s Solvina India Pvt. Ltd. are given below:

S.No.	Name	Contact No.(Mobile)	Email-id
1.	Mr. Mohammad Shahzad Alam	9910611184	shahzad.alam@solvina.com
2.	Mr. Deepesh Yadav	9873302435	Deepesh.Yadav@solvina.com
3.	Mr. Saurabh Bhargava	8010180398	saurabh.bhargava@solvina.com
4.	Mr. Jaidev Oza	9925846756	jaidev.oza@solvina.com

It is kindly requested to coordinate with testing agency as above to carry out the envisaged testing in time. After the contract, the final schedule of testing shall be coordinated with respective RLDC/RPC and NLDC. POSOCO assures all necessary help and support in this regard.

Thanking You,

Yours faithfully,

  
(Debasis De)

Executive Director-NLDC

Encl.: As above

Copy to:

1. Member Secretary, NRPC/WRPC/SRPC/ERPC/NERPC
2. Executive Director, NRLDC/WRLDC/SRLDC/ERLDC/NERLDC
3. Mr. Shahzad Alam, M/s Solvina India Pvt. Ltd.

*Testing of primary frequency response of generators as per IEGC clause 5.2(g)*

Page 2 of 2

## List of generating units allocated to M/s Solvina India to test primary response

Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Solvina)										
S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type (EHG/Mechanical/Other) (specify)	Governor has provisions for accepting the frequency simulation signal (Yes, No, Others-OEM required, NA-Data not available)
1	NR	NTPC Ltd	Singrauli	5	200	Coal	LMZ turbine	01.02.1984	Mechanical (HYDRAULIC GOVERNOR)	NO
2	NR	NTPC Ltd	Singrauli	6	500	Coal	BHEL	01.12.1986	EHG	YES
3	NR	NTPC Ltd	Singrauli	7	500	Coal	BHEL	01.11.1987	EHG	YES
4	NR	NTPC Ltd	Dadri stg-1	1	210	Coal	BHEL	01.01.93	EHG	YES
5	NR	NTPC Ltd	Dadri stg-1	2	210	Coal	BHEL	01.02.94	EHG	YES
6	NR	NTPC Ltd	Dadri stg-1	3	210	Coal	BHEL	01.04.95	EHG	YES
7	NR	NTPC Ltd	Dadri stg-1	4	210	Coal	BHEL	01.12.95	EHG	YES
8	NR	NTPC Ltd	Dadri stg-2	1	490	Coal	BHEL	31.01.2010	EHG	YES
9	NR	NTPC Ltd	Unchahar	1	210	Coal	BHEL	01.11.1988	EHG	YES
10	NR	NTPC Ltd	Unchahar	3	210	Coal	BHEL	01.01.1999	EHG	YES
11	NR	NTPC Ltd	Unchahar	4	210	Coal	BHEL	01.10.1999	EHG	YES
12	NR	NTPC Ltd	Unchahar	5	210	Coal	BHEL	01.09.2006	EHG	YES
13	NR	NTPC Ltd	Unchahar stg-4	1	500	Coal	BHEL	01.04.2017	EHG	YES
14	NR	NTPC Ltd	Dadri GPS	1	130.19	Gas	SIEMENS	01.05.92	EHG	YES
15	NR	NTPC Ltd	Dadri GPS	2	130.19	Gas	SIEMENS	01.06.92	EHG	YES
16	NR	NTPC Ltd	Dadri GPS	4	130.19	Gas	SIEMENS	01.11.92	EHG	YES
17	NR	NTPC Ltd	Anta	1	88.71	Gas	ABB	1989	EHG	YES
18	NR	NTPC Ltd	Anta	2	88.71	Gas	ABB	1989	EHG	YES
19	NR	NTPC Ltd	Anta	4	153.2	Gas	ABB	1990	EHG	YES
20	NR	NTPC Ltd	Auralya	1	111.19	Gas	MHI (Japan)	1989	EHG	YES
21	NR	NTPC Ltd	Auralya	2	111.19	Gas	MHI (Japan)	1989	EHG	YES
22	NR	NTPC Ltd	Auralya	4	111.19	Gas	MHI (Japan)	1989	EHG	YES
23	NR	APCPL	Jhajjar	1	500	Coal	BHEL	05-03-2011	EHG & HG	YES
24	NR	APCPL	Jhajjar	2	500	Coal	BHEL	21-04-2012	EHG & HG	Yes

Rahul Shukla

FOR SOLVINA : *Deepesh*  
DEEPESH YADAV

Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Solvina)										
S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type (EHG/Mechanical/Others (specify))	Governor has provisions for accepting the frequency simulation signals (Yes, No, Others-OEM required, NA-Data not available)
25	NR	APCPL	Jhajjar	3	500	Coal	BHEL	26-04-2013	EHG & HG	YES
26	NR	NHPC	Chamera-1	1	180	Hydro	M/s GE Power India Limited (Formerly known as M/s Alstom Power India Limited)	2008	EHG	YES
27	NR	NHPC	Chamera-1	3	180	Hydro	M/s GE Power India Limited (Formerly known as M/s Alstom Power India Limited)	2009	EHG	YES
28	NR	NHPC	Chamera-3	1	77	Hydro	M/s GE Power India Limited (Formerly known as M/s Alstom Power India Limited)	2012	T-SLG (Turbine Speed Load)	OTHERS
29	NR	NHPC	Kishanganga	2	110	Hydro	BHEL	24.05.18(COD)	EHG	YES
30	NR	SJVNL	Nathpa Jhakri	1	250	Hydro	Andritz hydro Pvt. Ltd.	18.05.2004	EHG	YES
31	NR	SJVNL	Nathpa Jhakri	2	250	Hydro	Andritz hydro Pvt. Ltd.	06.05.2004	EHG	YES
32	NR	SJVNL	Nathpa Jhakri	4	250	Hydro	Andritz hydro Pvt. Ltd.	30.03.2004	EHG	YES
33	NR	SJVNL	Nathpa Jhakri	5	250	Hydro	Andritz hydro Pvt. Ltd.	06.10.2003	EHG	YES
34	NR	SJVNL	Nathpa Jhakri	6	250	Hydro	Andritz hydro Pvt. Ltd.	02.01.2004	EHG	YES
35	NR	SJVNL	Rampur	4	68.67	Hydro	BHEL	19.06.2014	EHG	NA
36	NR	SJVNL	Rampur	5	68.67	Hydro	BHEL	13.05.2014	EHG	NA
37	NR	SJVNL	Rampur	6	68.67	Hydro	BHEL	16.12.2014	EHG	NA
38	NR	JSW	Karcham	1	250	Hydro	ANDRITZ HYDRO PRIVATE LIMITED	2011	EHG	YES
39	NR	JSW	Karcham	3	250	Hydro	ANDRITZ HYDRO PRIVATE LIMITED	2011	EHG	YES
40	NR	JSW	Karcham	4	250	Hydro	ANDRITZ HYDRO PRIVATE LIMITED	2011	EHG	YES
41	NR	THDC	Tehri	1	250	Hydro	LENINGRADSKY METALLICHESKY ZAVOD (LMZ) ST. PETERSBERG, LENINGRADSKY METALLICHESKY ZAVOD (LMZ) ST. PETERSBERG, RUSSIA.	2001	EHG	YES
42	NR	THDC	Tehri	2	250	Hydro	LENINGRADSKY METALLICHESKY ZAVOD (LMZ) ST. PETERSBERG, LENINGRADSKY METALLICHESKY ZAVOD (LMZ) ST. PETERSBERG, RUSSIA.	2001	EHG	YES
43	NR	THDC	Tehri	3	250	Hydro	LENINGRADSKY METALLICHESKY ZAVOD (LMZ) ST. PETERSBERG, LENINGRADSKY METALLICHESKY ZAVOD (LMZ) ST. PETERSBERG, RUSSIA.	2001	EHG	YES
44	NR	THDC	Tehri	4	250	Hydro	LENINGRADSKY METALLICHESKY ZAVOD (LMZ) ST. PETERSBERG, LENINGRADSKY METALLICHESKY ZAVOD (LMZ) ST. PETERSBERG, RUSSIA.	2001	EHG	YES
45	NR	THDC	Koteshwar	1	100	Hydro	BHEL	01.04.2011	EHGC	YES
46	NR	THDC	Koteshwar	3	100	Hydro	BHEL	13.02.2012	EHGC	YES
47	NR	THDC	Koteshwar	4	100	Hydro	BHEL	01.04.2012	EHGC	YES
48	NR	Everest Power	Malana-2	1	50	Hydro	TIASIN DESIGN & RESEARCH INSTITUTE OF ELECTRIC DRIVE	COD :12-Jul-2012	Stop motor with PLC as controller	YES

Rahul Shukla

FOR SOLVINA: *Neel/ash*

DEEPESH YADAV



Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Solvina)										
S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type (EHG/Mechanical/Other) (specify)	Governor has provisions for accepting the frequency simulation signals (Yes, No, Others-OEM required, NA-Data not available)
49	NR	Everest Power	Malana-2	2	50	Hydro	TIANJIN DESIGN & RESEARCH INSTITUTE OF ELECTRIC DRIVE TIANJIN, CHINA	COD:13-Jul-2012	Step motor with PLC as controller	YES
50	NR	BBMB	Bhakra (L)	2	126	Hydro	BHEL	1961	G-40 (EHG)	Yes
51	NR	BBMB	Bhakra (L)	4	126	Hydro	BHEL	1961	G-40 (EHG)	YES
52	NR	BBMB	Bhakra (L)	5	126	Hydro	BHEL	1961	G-40 (EHG)	Yes
53	NR	BBMB	Bhakra (H)	1	157	Hydro	Lening Radsky Metallichesky Zavod Russia	1966	GPP-LN1-100-M	YES
54	NR	BBMB	Bhakra (R)	2	157	Hydro	Lening Radsky Metallichesky Zavod Russia	1966	GPP-LN1-100-M	YES
55	NR	BBMB	Bhakra (R)	3	157	Hydro	Lening Radsky Metallichesky Zavod Russia	1967	GPP-LN1-100-M	Yes
56	NR	BBMB	Bhakra (R)	4	157	Hydro	Lening Radsky Metallichesky Zavod Russia	1967	GPP-LN1-100-M	Yes
57	NR	BBMB	Dehar	1	165	Hydro	M/s Andritz Hydro (Model no. AK 1703)	01.11.1977	Digital Microprocessor based Governor	YES
58	NR	BBMB	Dehar	5	165	Hydro	M/s Andritz Hydro (Model no. AK 1703)	01.03.1983	Digital Microprocessor based Governor	YES
59	NR	BBMB	Dehar	6	165	Hydro	M/s Andritz Hydro (Model no. AK 1703)	01.11.1983	Digital Microprocessor based Governor	YES
60	NR	BBMB	Pong	1	66	Hydro	M/s Andritz Hydro Pvt. Ltd.	2018	Digital Governor	YES
61	NR	BBMB	Pong	5	66	Hydro	M/s Andritz Hydro Pvt. Ltd.	2019	Digital Governor	YES
62	NR	BBMB	Pong	6	66	Hydro	M/s Andritz Hydro Pvt. Ltd.	2018	Digital Governor	YES
63	WR	NTPC Ltd	Korba STPS	1	200	Coal	BHEL	1984	EHG	YES
64	WR	NTPC Ltd	Korba STPS	2	200	Coal	BHEL	1984	EHG	Yes
65	WR	NTPC Ltd	Korba STPS	3	200	Coal	BHEL	1984	EHG	Yes
66	WR	NTPC Ltd	Korba STPS	4	500	Coal	BHEL	1988	EHG	YES
67	WR	NTPC Ltd	Korba STPS	5	500	Coal	BHEL	1989	EHG	Yes
68	WR	NTPC Ltd	Korba STPS	6	500	Coal	BHEL	1990	EHG	YES
69	WR	NTPC Ltd	Korba STPS	7	500	Coal	BHEL	2011	EHG	YES
70	WR	NTPC Ltd	Mouda	1	500	Coal	BHEL	2013	EHG	YES
71	WR	NTPC Ltd	Mouda	2	500	Coal	BHEL	2014	EHG	Yes
72	WR	NTPC Ltd	Mouda	3	660	Coal	SIEMENS	2017	EHG	YES

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FOR SOLVINA: *Deepesh*

DEEPESH YADAV



Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Solvina)										
S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type(EHG/Mechanical/Others(specify))	Governor has provisions for accepting the frequency simulation signals(Yes, No, Others-OEM required, NA-Data not available)
73	WR	NTPC Ltd	Mouda	4	660	Coal	BHEL	2017	EHG	YES
74	WR	NTPC Ltd	Vindhyachal-I	5	210	Coal	LMZ turbine		Mechanical (HYDRAULIC GOVERNOR)	NO
75	WR	NTPC Ltd	Vindhyachal-II	7	500	Coal	BHEL		EHG	YES
76	WR	NTPC Ltd	Vindhyachal-II	8	500	Coal	BHEL		EHG	YES
77	WR	NTPC Ltd	Vindhyachal-III	9	500	Coal	BHEL		EHG	YES
78	WR	NTPC Ltd	Vindhyachal-III	10	500	Coal	BHEL		EHG	YES
79	WR	NTPC Ltd	Vindhyachal-IV	11	500	Coal	BHEL		EHG	YES
80	WR	NTPC Ltd	Vindhyachal-IV	12	500	Coal	BHEL		EHG	YES
81	WR	NTPC Ltd	Vindhyachal-V	13	500	Coal	BHEL		EHG	YES
82	WR	NTPC Ltd	Gadarwara	1	800	Coal	BHEL	2016	EHG	YES
83	WR	NTPC Ltd	Lara	1	800	Coal				NA
84	WR	Balco	Balco	1	300	Coal	Dongfang Electrical Machinery			NA
85	WR	Balco	Balco	4	300	Coal	Dongfang Electrical Machinery			NA
86	WR	Tata Power	CGPL	10	830	Coal	Toshiba		DEHC TOSMAP-DS SR07e	NO
87	WR	Tata Power	CGPL	40	830	Coal	Toshiba		DEHC TOSMAP-DS SR07e	NO
88	WR	Tata Power	CGPL	50	830	Coal	Toshiba		DEHC TOSMAP-DS SR07e	NO
89	WR	DB Power	DB Power Ltd.	1	600	Coal	BHEL	Nov-14	EHG/ Mechanical	YES
90	WR	DB Power	DB Power Ltd.	2	600	Coal	BHEL	Mar-16	EHG/ Mechanical	YES
91	WR	Dhariwal-Infra	Dhariwal	2	300	Coal	Shanghai Electric			NA
92	WR	GMR Warora (GWEL)	GMR Warora (GWEL)	1	300	Coal	Shanghai Electric		EHG	YES
93	WR	GMR Warora (GWEL)	GMR Warora (GWEL)	2	300	Coal	Shanghai Electric		EHG	YES
94	WR	Essar Power(Mahan)	Essar Power(Mahan)	1	600	Coal	Harbin Electric Co.	2006	EHG	NO
95	WR	Essar Power(Mahan)	Essar Power(Mahan)	2	600	Coal	Harbin Electric Co.	2017	EHG	NO
96	WR	GMR	GMR-CG	1	685	Coal	Dootan	2011	EHG	YES

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FOR SOLVINA: *Neel*

DEEPESH YADAV

Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Solvina)										
S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type(EHG/Mechanical/Others(specify))	Governor has provisions for accepting the frequency stimulation signals(Yes, No, Others-OEM required, NA-Data not available)
97	WR	GMR	GMR-CG	2	685	Coal	Doosan	2011	EHG	YES
98	WR	Jhabua Power Ltd	Jhabua	1	600	Coal	BHEL	2016	EHG (Electro Hydraulic Backed up with Hydro-Mechanical)	YES
99	WR	Jindal Power	Jindal Stage-I	1	250	Coal	BHEL	2008	EHC	YES
100	WR	Jindal Power	Jindal Stage-I	3	250	Coal	BHEL	2009	EHC	YES
101	WR	Jindal Power	Jindal Stage-I	4	250	Coal	BHEL	2009	EHC	YES
102	WR	Jindal Power	Jindal Stage-II	1	600	Coal	BHEL	2014	EHC	YES
103	WR	Jindal Power	Jindal Stage-II	4	600	Coal	BHEL	2016	EHC	YES
104	WR	KSK Mahanadi	KSK Mahanadi	1	600	Coal	Dongfang Electrical Machinery	2013	EHG	YES
105	WR	KSK Mahanadi	KSK Mahanadi	2	600	Coal	Dongfang Electrical Machinery	2014	EHG	YES
106	WR	KSK Mahanadi	KSK Mahanadi	3	600	Coal	Dongfang Electrical Machinery	2017	EHG	YES
107	WR	KWPCL	KWPCL	1	600	Coal	BHEL			NA
108	WR	Lanco Amarkantak	Lanco	1	300	Coal	DEC CHINA	2010	EHG	YES
109	WR	Lanco Amarkantak	Lanco	2	300	Coal	DEC CHINA	2009	EHG	YES
110	WR	Hindustan Power Ltd	MB-Power	1	600	Coal	Harbin Electric			NA
111	WR	Hindustan Power Ltd	MB-Power	2	600	Coal	Harbin Electric			NA
112	WR	ACBIL	MCCPL	1	300	Coal	Beijing Beihong Steam Turbine Generator Co. Ltd	2012	EHG	YES
113	WR	RKM	RKM	1	360	Coal	Herbin Electrical		EHG	YES
114	WR	RKM	RKM	3	360	Coal	Herbin Electrical		EHG	YES
115	WR	RKM	RKM	4	360	Coal	Herbin Electrical		EHG	YES
116	WR	SKS	SKS	1	300	Coal	HTC (HARBIN TURBINE COMPANY LTD)	2013	DEH	YES
117	WR	SKS	SKS	2	300	Coal	HTC (HARBIN TURBINE COMPANY LTD)	2013	DEH	YES
118	WR	TRN	TRN	1	300	Coal	Beizong Bezone		DEH (Digital Electro hydraulic)Governor	YES
119	WR	TRN	TRN	2	300	Coal	Beizong Bezone		DEH (Digital Electro hydraulic)Governor	YES
120	WR	DGEN	Torrent Power	1	400	Gas	Siemens	2015	EHG	NA

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FOR SOLVINA: Neellesh  
DEEPESH YADAV

Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Solvina)										
S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type (EHG/Mechanical/Others (specify))	Governor has provisions for accepting the frequency simulation signals (Yes, No, Others-OEM required, NA-Data not available)
121	WR	RCPPL	Ratnagiri Phase III*	1	213	Gas	GE	1999	EHG	YES
122	WR	NCA	SSP CHFH (Hy)	1	50	Hydro	BHEL	04-10-2004	EHG	YES
123	WR	NCA	SSP CHFH (Hy)	4	50	Hydro	BHEL	03-09-2004	EHG	YES
124	WR	NCA	SSP CHFH (Hy)	5	50	Hydro	BHEL	15-12-2004	EHG	YES
125	WR	NCA	SSP RBPH (Hy)	1	200	Hydro	TOSHIBA	01-02-2005	EHG	YES
126	WR	NCA	SSP RBPH (Hy)	5	200	Hydro	TOSHIBA	07-03-2006	EHG	YES
127	WR	NCA	SSP RBPH (Hy)	6	200	Hydro	TOSHIBA	20-06-2006	EHG	YES
128	SR	NTPC	RAMAGUNDAM TPS	1	200	Coal	ANSALDO	1984	EHG	NO
129	SR	NTPC	RAMAGUNDAM TPS	4	500	Coal	BHEL	1988	EHG	YES
130	SR	NTPC	RAMAGUNDAM TPS	5	500	Coal	BHEL	1989	EHG	YES
131	SR	NTPC	RAMAGUNDAM TPS	6	500	Coal	BHEL	1991	EHG	YES
132	SR	NTPC	RAMAGUNDAM TPS	7	500	Coal	BHEL	2005	EHG	YES
133	SR	NTPC	TALCHER STAGE 2	1	500	Coal	BHEL	01-08-2003	EHG	YES
134	SR	NTPC	TALCHER STAGE 2	2	500	Coal	BHEL	01-03-2004	EHG	YES
135	SR	NTPC	TALCHER STAGE 2	3	500	Coal	BHEL	01-08-2005	EHG	YES
136	SR	NTPC	TALCHER STAGE 2	4	500	Coal	BHEL	01-08-2005	EHG	YES
137	SR	NTPC	NTPC KUDGI	1	800	Coal	TOSHIBA	31-07-2017	EHG	NO
138	SR	NTPC	NTPC KUDGI	3	800	Coal	TOSHIBA	15-09-2018	EHG	NO
139	SR	Sembcorp Energy India Limited (formerly Thermal Powertech Corporation India Limited, SPSR)	Sembcorp Energy India Limited P1 (formerly Thermal Powertech Corporation India Limited, SPSR)	1	660	Coal	Dong Fang, China	2015	Digital Electro Hydraulic	NA
140	SR	Sembcorp Energy India Limited (formerly Thermal Powertech Corporation India Limited, SPSR)	Sembcorp Energy India Limited P1 (formerly Thermal Powertech Corporation India Limited, SPSR)	2	660	Coal	Dong Fang, China	2015	Digital Electro Hydraulic	NA
141	SR	IL & FS Tamilnada Power Company Ltd., Cuddalore.	IL&FS	1	600	Coal	DONGFANG ELECTRIC MACHINERY CO.LTD	2013	EHG	NO
142	SR	IL & FS Tamilnada Power Company Ltd., Cuddalore.	IL&FS	2	600	Coal	DONGFANG ELECTRIC MACHINERY CO.LTD	2014	EHG	NO
143	SR	Sembcorp Energy India Limited (formerly Sembcorp Gayatri Power Ltd.)	Sembcorp Energy India Limited P2 (formerly Sembcorp Gayatri Power Ltd.)	1	660	Coal	Harbin, China	2016	Digital Electro Hydraulic	NA

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FOR SOLVINA: Neelish

DEEPESH YADAV



Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Solvina)										
S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type (EHG/Mechanical/Others (specify))	Governor has provisions for accepting the frequency simulation signals (Yes, No, Others-OEM required, NA-Data not available)
144	SR	Sembcorp Energy India Limited (Formerly Sembcorp Gayatri Power Ltd).	Sembcorp Energy India Limited P2 (Formerly Sembcorp Gayatri Power Ltd).	2	660	Coal	Harbin, China	2017	Digital Electro Hydraulic	NA
145	SR	NTPC Tamilnadu Energy Company Ltd, Chennai	VALLUR TPS	1	500	Coal	BHEL	2012	EHG	YES
146	SR	NTPC Tamilnadu Energy Company Ltd, Chennai	VALLUR TPS	3	500	Coal	BHEL	2015	EHG	YES
147	SR	NLC Tamilnadu Power Limited, Tuticorin	NTPL	1	500	Coal	BHEL	2015	EHG/ Mechanical	YES
148	SR	NLC Tamilnadu Power Limited, Tuticorin	NTPL	2	500	Coal	BHEL	2015	EHG/ Mechanical	YES
149	SR	NLC	NLC TPS II Stage II	4	210	Coal	BHEL	30-03-1991	EHG	NO
150	SR	NLC	NLC TPS I Expansion	1	210	Coal/Lignite	ANSALDO	2002	Digital EHG	YES
151	SR	NLC	NLC TPS I Expansion	2	210	Coal/Lignite	ANSALDO	2003	Digital EHG	YES
152	SR	NLC	NLC TPS II Expansion	1	250	Coal	BHEL	2015	EHG	NA
153	SR	NLC	NLC TPS II Expansion	2	250	Coal	BHEL	2015	EHG	NA
154	SR	NLC	New Neyveli Thermal Power Station	1	500	Coal	BHEL		EHG/ Mechanical	YES
155	ER	NTPC	Farakka	1	200	Coal	BHEL	1986	EHG	YES
156	ER	NTPC	Farakka	3	200	Coal	BHEL	1988	EHG	YES
157	ER	NTPC	Farakka	4	500	Coal	BHEL	1996	EHG	YES
158	ER	NTPC	Farakka	5	500	Coal	BHEL	1995	EHG	YES
159	ER	NTPC	Farakka	6	500	Coal	BHEL	2012	EHG	YES
160	ER	NTPC	Kahalgan	1	210	Coal	LMZ turbine, control system R&M by M/s SIEMENS	1995	Mechanical/ HYDRAULIC GOVERNOR WITH A DROOP OF 4.5%	NO
161	ER	NTPC	Kahalgan	5	500	Coal	BHEL	2008	EHG	YES
162	ER	NTPC	Kahalgan	6	500	Coal	BHEL	2008	EHG	YES
163	ER	NTPC	Kahalgan	7	500	Coal	BHEL	2010	EHG	YES
164	ER	NTPC	Daripalli	1	800	Coal	TOSHIBA JSW POWER SYSTEMS PRIVATE LIMITED	2019	D-EHC (Digital Electro-Hydraulic Control)	YES
165	ER	NTPC	TSTPP	1	500	Coal	ABB, Germany	1997	EHG	NO
166	ER	NTPC	TSTPP	2	500	Coal	ABB, Germany	1997	EHG	NO

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FOR SOLVINA: *Deepesh*  
DEEPESH YADAV



Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Solvina)										
S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type(EHG/Mechanical/Others(specify))	Governor has provisions for accepting the frequency simulation signals(Yes, No, Others-OEM required, NA-Data not available)
167	ER	NTPC	Barh	4	660	Coal	M/A Siemens Germany	2014	EHG	NO
168	ER	NTPC	Barh	5	660	Coal	M/s BHEL/Siemens	2016	EHG	NO
169	ER	APNRL	Adhunik	1	270	Coal	BHEL	2013	Digital Governing System	NO
170	ER	APNRL	Adhunik	2	270	Coal	BHEL	2013	Digital Governing System	NO
171	ER	BRBCL	BRBCL	1	250	Coal	BHEL	2019	EHG	NO
172	ER	BRBCL	BRBCL	2	250	Coal	BHEL	2017	EHG	NO
173	ER	NPGC	NPGC	1	660	Coal	GE Power India	2019	EHG	NO
174	ER	NHPC	Teesta V	1	170	Hydro	TOSHIBA, JAPAN	2008	EHG (with Microprocessor based regulator having P.I.D functions)	NO
175	ER	TUL	Teesta III	1	200	Hydro	Andritz Hydro	2017	Digital Governor with PID controller	YES
176	ER	TUL	Teesta III	2	200	Hydro	Andritz Hydro	2017	Digital Governor with PID controller	YES
177	ER	TUL	Teesta III	4	200	Hydro	Andritz Hydro	2017	Digital Governor with PID controller	YES
178	ER	TUL	Teesta III	5	200	Hydro	Andritz Hydro	2017	Digital Governor with PID controller	YES
179	ER	TUL	Teesta III	6	200	Hydro	Andritz Hydro	2017	Digital Governor with PID controller	YES
180	ER	Sheha Kinetic	Dikchu	1	48	Hydro	ALSTOM-NEVRPIC T.SLG	2017	EHG	NO
181	ER	Sheha Kinetic	Dikchu	2	48	Hydro	ALSTOM-NEVRPIC T.SLG	2017	EHG	NO
182	NER	NTPC	Bongaigaon TPP	1	250	Coal	BHEL	2010-11	EHG (DCS system for governor : MaxDNA (version 4.6.2))	YES
183	NER	NTPC	Bongaigaon TPP	2	250	Coal	BHEL	2010-12	EHG (DCS system for governor : MaxDNA (version 4.6.2))	YES
184	NER	NTPC	Bongaigaon TPP	3	250	Coal	BHEL	2010-13	EHG (DCS system for governor : MaxDNA (version 4.6.2))	YES
185	NER	NEEPCO	Manarehak	GT	65.42	GAS	BHEL	Mar-15	SERVO CONTROL (ADVANCED FORM OF ELECTRO HYDRAULIC)	YES
186	NER	NEEPCO	Manarehak	ST	35.58	GAS	BHEL	Jan-16	EHTC( ELECTRO HYDRAULIC TURBINE CONTROL)	YES
187	NER	NEEPCO	Kopili St II	1	25	Hydro	BHEL	2004	HMC/Pro-Control-13 based EHGC	YES
188	NER	NEEPCO	Khandong	2	25	Hydro	BHEL	2014 (EHGC)	G-40 (HMC) & RGMO/FGMO EHGC	YES
189	NER	NEEPCO	Ranganadi	1	135	Hydro	BHEL	2002	HMC G-40/MAX DNA Based EHGC	YES
190	NER	NEEPCO	Ranganadi	2	135	Hydro	BHEL	2002	HMC-G-40/Mav DNA Based EHGC	YES

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FOR SOLVINA: *Deepesh*

DEEPESH YADAV

Generating Machines under RLDC for testing Primary Frequency Response (Proposed allocation to Solvina)										
S.No.	Region	Name of Utility	Station	Generating Unit	Capacity (MW)	Fuel Type	OEM	Vintage	Governor Type (EHG/Mechanical/Others (specify))	Governor has provisions for accepting the frequency simulation signals (Yes, No, Others-OEM required, NA-Data not available)
191	NER	NEEPCO	Ranganadi	3	135	HYDEL	BHEL	2002	HMC G-40/MAX DNA Based EHG	YES
192	NER	NEEPCO	Tulrial	1	30	Hydro	BHEL	2017	HMC, G-40/Max DNA Based EHG	YES
193	NER	NEEPCO	Tulrial	2	30	Hydro	BHEL	2017	HMC G-40/MAX DNA Based EHG	YES
194	NER	NEEPCO	Pare	1	55	Hydro	Andritz Hydro	2018	Andritz Hydro Make Digital Governor	YES
195	NER	NEEPCO	Pare	2	55	Hydro	Andritz Hydro	2018	Andritz Hydro Make Digital Governor	YES
196	NER	NHPC	Loktak	1	35	Hydro	LMZ	2010	EHG	YES
197	NER	NHPC	Loktak	2	35	Hydro	LMZ	08.06.2009	EHG	YES
198	NER	NHPC	Loktak	3	35	Hydro	LMZ	10.09.2009	EHG	YES
199	NER	OTPL	Palatana	GT-II	232.39	GAS	BHEL	2010	EHG	YES
200	NER	OTPL	Palatana	ST-II	138.91	GAS	BHEL	2010	EHG	YES

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FOR SOLVINA : *Deepesh*  
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