To: Members of OCC

Subject: Minutes of 135th OCC meeting.

135th meeting of the Operation Co-ordination sub-committee was held on 16.05.2017 & 18.05.2017. The Minutes of this meeting have been up-loaded on the NRPC web-site http://www.nrpc.gov.in.
Minutes for the 135th Meeting of the Operation Coordination Sub-Committee (OCC) of NRPC

135th meeting of the Operation Coordination Sub Committee (OCC) of NRPC was held on 16.5.2017 & 18.5. 2017 at New Delhi.

1. **Confirmation of Minutes:**
The Minutes of the 134th meeting of the OCC held 12.04.2017 & 24.04.2017 were issued vide letter dated 9.5.2017. The minutes were confirmed without any modifications.

2. **Maintenance programme for Generating Units.**
The maintenance programme for Generating Units for the month of June, 2017 was discussed on 16.5.2017. The details of approved/deferred outages of generating units as per deliberations in OCC were issued vide letter of even number dated 22.5.2017. (copy stands uploaded on NRPC website)

2.2 **Outage programme for Transmission Elements.**
The Outage programme of transmission assets for the month of June 2017 was discussed on 16.5.2017. The details of approved/deferred outages of transmission assets as per deliberations in OCC were issued vide letter dated 22.5.2017. (copy stands uploaded on NRPC website)

3. **Planning of Grid Operation for May, 2017:**

3.1 **Anticipated Power Supply Position in Northern Region during June, 2017 (As per LGBR 2017-18)** is as under:

Anticipated Power Supply Position in Northern Region during June, 2017 (As per LGBR) was discussed in the meeting. The amended table Anticipated Power Supply Position in Northern Region during June, 2017 after discussion in the OCC meeting is as under:

<table>
<thead>
<tr>
<th>State</th>
<th>Anticipated Peak Demand (MW)</th>
<th>Expected Peak Availability (MW)</th>
<th>Surplus (+)/ Deficit (-) (%)</th>
<th>Anticipated Energy Requirement (MU/day)</th>
<th>Expected Energy Availability (MU/day)</th>
<th>Surplus (+)/ Deficit (-) (MU/day)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chandigarh</td>
<td>390</td>
<td>365</td>
<td>-25</td>
<td>-6.4</td>
<td>6.40</td>
<td>6.20</td>
<td>-0.20</td>
</tr>
<tr>
<td>Delhi</td>
<td>6550</td>
<td>6887</td>
<td>337</td>
<td>0.05</td>
<td>123</td>
<td>161</td>
<td>38</td>
</tr>
<tr>
<td>Haryana</td>
<td>9340</td>
<td>8880</td>
<td>-460</td>
<td>-4.9</td>
<td>166.20</td>
<td>175.10</td>
<td>8.90</td>
</tr>
<tr>
<td>H.P.</td>
<td>1306</td>
<td>2063</td>
<td>757</td>
<td>36.6</td>
<td>26.77</td>
<td>43.76</td>
<td>16.61</td>
</tr>
<tr>
<td>J&amp;K</td>
<td>2520</td>
<td>2163</td>
<td>-357</td>
<td>-14.2</td>
<td>50.31</td>
<td>43.99</td>
<td>-6.32</td>
</tr>
<tr>
<td>Punjab</td>
<td>11600</td>
<td>11136</td>
<td>-464</td>
<td>-4.0</td>
<td>210.08</td>
<td>214.08</td>
<td>4.00</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>9382</td>
<td>11166</td>
<td>1784</td>
<td>19</td>
<td>212.87</td>
<td>216.29</td>
<td>3.43</td>
</tr>
<tr>
<td>U.P.</td>
<td>18000</td>
<td>18200</td>
<td>200</td>
<td>1.1</td>
<td>360</td>
<td>368</td>
<td>8</td>
</tr>
<tr>
<td>Uttarakhand</td>
<td>2050</td>
<td>1975</td>
<td>-75</td>
<td>-3.7</td>
<td>42.25</td>
<td>42.5</td>
<td>-0.05</td>
</tr>
<tr>
<td>Region</td>
<td>61138</td>
<td>62835</td>
<td>1697</td>
<td>23.55</td>
<td>1197.88</td>
<td>1270.92</td>
<td>72.47</td>
</tr>
</tbody>
</table>

It was noted that most of the States in the Northern Region would be comfortable in power supply position. However it was discussed at length that Haryana will plan to manage the
deficit through bilateral power purchase and Punjab will go in for short term purchase. Uttrakhand submitted that they will manage the power supply by load shedding.

3.2 Anticipated vis-à-vis Actual Power Supply Position (Provisional) for April 2017.
SE, NRPC stated that there were much variations (i.e. > 5.0%) in the anticipated vis-à-vis actual Power Supply Position (Provisional) for the month of April, 2017 in the terms of Energy requirement for Rajasthan and in terms of Peak demand for Delhi, Punjab, HP & UP.

The variation in anticipated (provisional) and actual energy requirement and peak demand (provisional) was discussed at length.

Delhi, Punjab & UP variation was due to unexpected rise in temperature during 3rd week of the month of April, 2017. MS, NRPC emphasized the need to improve the demand estimation taking into account weather conditions/ monsoon records for previous years and IMD forecast. Also it was discussed that the proper utilization of the NRLDC-IMD weather website for Northern Region be made for forecasting of load.

OCC advised all the members to submit the reasons for variation along with the Provisional Supply position to facilitate the discussion in the OCC meeting  
(Action: All SLDCs)

3.3 Power Supply Position:
The provisional Power Supply Position and Notified Power Cuts for the month of April, 2017 are available on CEA website. All SLDCs were requested to furnish the provisional and final power supply position in prescribed formats by 2nd and 15th day of the month, respectively.  
(Action: All SLDCs)

4. Power Supply Position for NCR:
NCR Planning Board (NCRPB) is closely monitoring the power supply position of National Capital Region. Monthly power supply position for NCR till the month of March, 2017 is placed on NRPC website.

Members were requested to furnish the data on regular and time bound manner.  
(Action: All SLDCs)

5. Monitoring of schemes funded from PSDF(Agenda by NPC)
Representative of NPC detailed in the OCC that in the 6th meeting of NPC held on 19th December 2016, it was decided that all the RPCs in the monthly OCC meetings may follow up with entities to expedite completion of the scheme by giving due priority. The implementation of most of these schemes is based on the recommendation of the Enquiry Committee on Grid Disturbance of July 2012 headed by Chairperson, CEA. Therefore, timely implementation of these schemes would enhance the grid security and reliability. The updated status as brought forth by the members in the meeting is placed at Annex-I.

The concerned utilities were requested to submit the progress, physical and financial both, of implementation of these schemes on monthly basis.
All utilities were stressed by the Representative of NPC to expedite the implementation of schemes already approved. It was also brought forth that the utilities should bring forward new schemes for approval of funding that will improve the Grid stability and strengthen/improve the system.

(Action: All the concerned utilities; Time Line: 10th Day of every month)

6. **Information about variable charges of all the generating units in the Region.**

As per decision taken in 103rd OCC meeting, all generating entities are required to furnish the variable charges of their generating units on monthly basis to NRPC secretariat. It was also decided that SLDCs would submit the variable charges of the generating units located in their control area. The details of variable charges as submitted by utilities are available on NRPC website.

**Members were requested to submit the updated information regularly**

7. **Sub-stations likely to be commissioned in next 6 months.**

As decided in the 108th OCC meeting, utilities were requested to submit details of substations at 220 KV and above level, likely to be commissioned within next 6 months in the prescribed format.

The latest available status of the sub-stations to be commissioned by POWERGRID NR 1&3 has been uploaded on the NRPC website.

**In the 135th OCC meeting** POWERGRID NR-2 updated the status has been uploaded on the NRPC website.

**All the concerned States were requested to specifically update the downstream network of the Power Grid upcoming Assets.**

OCC also advised all the members to expedite these networks to ensure optimal utilisation of transmission assets and to obviate system constraints.

All utilities were requested to submit details of substations at 220 KV and above level, likely to be commissioned within next 6 months in the prescribed format in the OCC meeting. **The available status stands updated on the NRPC website.**

(Action: All transmission utilities; Time line: 15.06.2017)

8. **Cleaning and Replacement of porcelain insulators:**

The updated status as submitted by utilities regarding cleaning of insulators/replacement of porcelain insulators as available with the NRPC Sectt. has been uploaded on the NRPC website.

**All the utilities in meeting were again requested to submit the detailed status of Replacement of Porcelain Insulators in respect of OUTAGES TAKEN FOR THE INSULATOR REPLACEMENT WORK DURING RECENT MONTHS. Also it was deliberated that the work of replacement of Porcelain Insulators may be taken after the Paddy Season keeping in view the high loading conditions.**

(Action: All concerned utilities; Time line: 15.6.2017)

Recommendations pertaining to operational aspects made by the Enquiry committee for grid disturbances on 30th July, 2012 & 31st July, 2012 are as under:

9.1 **Healthiness of defense mechanism: Self-certification**

i. It was decided in the 27th meeting of NRPC held on 30th November, 2012 that all STUs would ensure load relief as per target and settings of UFR and df/dt relays. Mock exercise for healthiness of UFRs was to be carried out by utilities themselves on quarterly basis and report was to be submitted to NRPC Secretariat and NRLDC. Further, it was decided in the 31st meeting of NRPC held on 24.7.2014 that the quarterly test report of UFR and df/dt would be uploaded on the website of respective SLDC.

All utilities were requested to maintain the healthiness of the UFR Relays. Report of the UFR Testing ending March 2017 have been received from HVPNL, UPPTCL, PSTCL, DTL, Himachal, BBMB & RVNL. PTCUL was advised in the meeting to submit the report.

(Action: PTCUL; Time line: 15.6.2017)

All utilities were advised to certify specifically, in the report that would be submitted for the next quarter, that “All the UFRs are checked and found functional”. Any discrepancy should be detailed upon and the time line for rectification of the same should also be intimated.

(Action: All STUs; Time line: At the time of submission of the self certification report)

ii. In earlier meetings, BBMB had informed that replacement of static relays into numerical relays at 7 sub-stations (2 sub-stations in Punjab at Jamalpur & Sangrur and 5 stations in Haryana at Panipat, Dhulkot, Kurukshtetra, Jagadhari & Hisar) by PSTCL and HVPNL was pending. The issue has been discussed in several OCC meetings. HVPNL, in the 134TH OCC meeting, had intimated that the LOA for procurement of 22 UFR relays has been placed.

HVPNL was updated that the new supplies would be received by 30.6.2017 and there after the replacement of Relays at BBMB substations will be taken up. PSTCL informed that the needful action is being done and the matter is being resolved in coordination with the firm and the BBMB.

(Action: PSTCL; Time line: 31.05.2017)

(Action: HVPNL; Time line: 31.07.2017)

iii. On scrutiny of the UFR report, it was noted that the static type UFRs were still installed on Transformers/feeders emanating from 132KV Majra and Jwalapur Substations and 220KV Ramnagar, Roorkee and Rishikesh Substations.

OCC expressed concern over non representation of PTCUL in the meeting. OCC advised all the members should ensure proper representation in the meeting.
9.2 Strengthening of Intra-State transmission system

Recommendation of the Enquiry Committee: “Intra-State transmission system needs to be planned and strengthened in a better way to avoid problems of frequent congestion.”

In the NRPC meeting held on 30\textsuperscript{th} November, 2012, it was decided that SLDCs should give half yearly feedback to STU regarding bottlenecks, constraints and overloading in the State transmission network for proper transmission planning.. All SLDCs were requested to submit advice regarding constraints to their STUs, regularly at half yearly intervals i.e. on 1\textsuperscript{st} January and 1\textsuperscript{st} July of every year.

In the 132\textsuperscript{nd} OCC meeting, it was noted that all utilities had submitted the report ending December 2016. All the members were requested to submit the information regarding the action taken/action plan of the STU on the feedback given by respective SLDCs. It was also deliberated that CEA may be apprised of the SLDCs’ feedback for optimal planning of the network in the respective States. OCC advised all the SLDCs to submit the next half yearly feedback ending June 2017 with more details in line with the feedback given by NRLDC in the various OCC Meetings.

DTL, HVPNL in the meeting were again requested to submit the action taken/planned by the STUs on the recommendations given by the SLDC. Regarding all the other states it was informed in the meeting that the feedback of the STUs had been forwarded to the CEA for considering the same in the Agenda of the Standing Committee of Power System Planning.

(Action: DTL, HVPNL; Time Line: 31.05.2017)

9.3 Installation of adequate static and dynamic reactive power compensators.

9.3.1 Based on the studies carried out by POWERGRID for identifying compensation required in intra-State network at 220 kV level, discussions in the 29\textsuperscript{th} Meeting of NRPC and subsequent discussion, reactors were to be installed at 9 locations, out of which 6 have been installed. The updated status of remaining 3 reactors is as under:

<table>
<thead>
<tr>
<th>S.No</th>
<th>SUBSTATION</th>
<th>MVAR</th>
<th>Implementation by</th>
<th>Updated Status in 135\textsuperscript{th} OCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HINDAUN</td>
<td>125</td>
<td>RVPNL</td>
<td>Expected by 31.05.2017.</td>
</tr>
<tr>
<td>2</td>
<td>MANESAR</td>
<td>125</td>
<td>POWERGRID</td>
<td>Expected by 31.08.2017</td>
</tr>
<tr>
<td>3</td>
<td>MERTA</td>
<td>125</td>
<td>RVPNL</td>
<td>Expected by 30.06.2017</td>
</tr>
</tbody>
</table>

(Action: POWERGRID and RVPNL)
9.3.2 Study by POWERGRID for reactive compensation at 220 kV level:

The proposal for installation of bus reactors at 12 nos. 400 kV and 17 nos. 220 kV sub-stations was discussed in the 29th meeting of NRPC held on 13th September 2013. After deliberations, NRPC had approved installation of reactors at 400 kV sub-stations of POWERGRID and RVPNL. As regards 220kV bus reactors, POWERGRID had stated that the requirement would be firmed up in consultation with the States. Subsequently, POWERGRID, vide email dated 30.09.2016 had submitted report of the study. In this report, reactors at 13 locations at 220 kV levels and at 24 locations at 400 kV level had been proposed.

The report was discussed in 34th TCC/38th NRPC meeting held on 24th /25th October, 2016 wherein Delhi had requested to review the system study for its system. POWERGRID agreed for the same. Subject to review of requirement for Delhi, NRPC approved the report. In the meeting, representative of Delhi informed that the report would be finalized shortly. In the meeting it was informed that as per decision in 35th TCC/39th NRPC meeting held on 1-2.5.2017 the report of the POWERGRID and the study by RVPNL to be referred to the Standing Committee on Power System Planning of NR.OCC advised Power Grid and RVPNL to take action in this regard.

(Action: POWERGRID, RRVPNL, DTL to update)

10. System Protection Schemes (SPSs) in Northern Region:

10.1 SPS for Interruption of import by NR at 765 kV Agra (from WR).

Review of SPS for 765 kV Agra-Gwalior line

The revised SPS for contingency of 765 kV Agra-Gwalior was approved in 32nd TCC/36th NRPC meeting held on 23rd /24th December, 2015. It was also agreed in the 36th NRPC meeting that POWERGIRD would implement the revised scheme within 06 months after the receipt of the feeder details from the states.

In the 129th OCC POWERGRID stated that the scheme would be commissioned by 31.05.2017.

In the 132nd OCC meeting representative of POWERGRID proposed that provision of AMC of the scheme for 05 years could also be included in the scope of the work for implementation of the revised scheme. Members agreed to the proposal of POWERGIRD.

The representative of POWERGRID further stated that the cost of implementation of revised SPS for 765KV Agra-Gwalior lines could be booked in any ongoing project/ work of Northern Region. SE (O), NRPC stated that the same had already been recommended by OCC in its 128th OCC meeting. POWERGRID representative informed that they were waiting for NRPC approval in this regard. After detailed deliberation it was decided that keeping in view urgency of the work, POWERGRID should carry out tendering activities for timely implementation of the revised scheme. The recommendation of the OCC would be put up for concurrence of NRPC in next meeting.
Representative of POWERGRID stated that it may not be possible to adhere to the commissioning schedule agreed in 129th OCC meeting. Members were of the opinion that in view of the criticality of the scheme POWERGRID should strive to complete the commissioning of the scheme.

In 133rd OCC meeting, POWERGRID representative stated that tendering activities were in process. The POWERGRID representative submitted that as the tendering process takes time, the implementation would be done till August/September 2017. NRLDC representative stated that all out efforts should be made to complete the work before Paddy season, as per earlier schedule of implementation.

It was discussed in the meeting that the approval of NRPC has been given in its 39th meeting of NRPC held ON 2.5.2017 to the proposal given in the 129th OCC meeting by POWERGRID for booking the cost of revised SPS including 05 years AMC in some other on-going project/work.

It was however stressed that In view of the criticality of 765 kV Agra-Gwalior line for NR, POWERGRID may commission the scheme as per the agreed schedule. POWERGRID had intimated that scheme would be commissioned by October, 2017.

OCC again requested POWERGRID to expedite the same and update in the OCC regularly.

(Action: POWERGRID)

OCC expressed its concern about no progress made by the state utilities so far regarding mapping of feeders, identified for the SPS load relief, in SCADA

OCC advised all concerned utilities in the meeting to take action in this regard at the earliest and inform the action taken. PSTCL intimated in the meeting that they had submitted the Performa to their SCADA team for further necessary action. UPPTCL intimated that they will submit the information within a week. DTL intimated that at 220KV level mapping had been done and they will intimate the work done to NRLDC. RRVPNL was requested to update. All the STUs were advised to do needful at the earliest. (Action: UPPTCL, DTL, HVPNL, PSTCL, RRVPNL)

Regarding the DTPC defect at Muzaffarnagar. POWERGRID representative stated that the issue would be resolved by May end.

(Action: POWERGRID)

POWERGRID representative stated that in view of recent multiple tripping at Agra Sub Station, the Mock Testing of SPS for 765 kV Agra-Gwalior line is required. After deliberation it was decided that the same may be done on 1.6.2017 from 7:00 to 11:00.

(Action: POWERGRID)

10.2 SPS for ICTs at 765 kV Unnao sub-station:

A discussion was held on 06.05.2015 in NRPC secretariat with the officers from UPRVUNL in the presence of officers from NRLDC, POWERGRID and NRPC sect. UPRVUNL was briefed about the basic philosophy along with the hardware requirement of the System Protection Scheme (SPS) for evacuation of Anpara-D generation. It was agreed that UPRVUNL along with UP SLDC would prepare the
SPS for safe power evacuation of Anpara-D. Further the scheme would be submitted to the OCC for approval. Thereafter, the matter was under discussion in various OCC meetings without much progress.

As decided in the 121st OCC meeting, the scheme was to be implemented by UPPTCL. The issue has been discussed in various OCC and TCC/RPC meetings. In this meeting, it was informed by the representative of UPPTCL that the implementation of the scheme had been started and would be done by 15.6.2017.

(Action: UPPTCL)

10.3 SPS for Kawai-Kalisindh-Chhabra generation complex:

SPS for Kawai-Kalisindh-Chhabra generation complex recommended in 122nd OCC meeting held on 22nd April, 2016. RVPN, vide email dated 26.07.2016 has confirmed that the SPS for Kawai-Kalisindh-Chhabra generation complex has been put into operation. However, it is understood that the automatic load shedding recommended in part (c) of the scheme has not been implemented by RRVPN. The scheme was discussed in 34th TCC/38th NRPC meeting held on 24th/25th October, 2016 wherein RRVPN stated that feeders have been identified and the scheme would be completed by March 2017.

In the 129th OCC representative of Rajasthan intimated that, the part of the scheme related to load shedding would be completed by March, 2017.

In 131st OCC, representative of RVPN intimated that load shedding part of the scheme has been installed on trial basis for 100MW load. Mock testing of the SPS would be done for the shortlisted load and if successful the scheme would be extended for complete 700 MW load.

OCC had advised RVPN to implement the SPS scheme for the identified load at the earliest and submit the report to NRLDC and NRPC Secretariat.

In 133rd OCC meeting, representative of RVPN submitted that the administrative approval for implementation of the Automatic Load shedding for identified feeders have been obtained and the NIT for the work would be floated soon.

Also regarding revision in SPS scheme after commissioning of Chhabra stage - II (Unit 5), RVPN representative stated that the same is under consideration and information in this regard would be submitted shortly.

In 134th meeting representative of RRVPN intimated that the scheme has been revised due to the commissioning of Chhabra stage – II. On the query regarding quantum of backing down of generation with N-1 contingency of 400 kV Kwai-Anta ckt.- 1 & 2 and 765 kV Anta-Phagi ckt.- 1 & 2, representative of RRVPN intimated that generation will be reduced to 65 % of the installed capacity.

9
OCC suggested RRVPNRL that the reduction in generation up to 60% of the installed capacity in the above mentioned contingency may be considered. RRVPNRL agreed to review the scheme.

RRVPNRL representative intimated that the issue was being discussed with the Generation Company. MS, NRPC stated that the long pending issue should be resolved at the earliest.

(Action : RRVPNRL)

11. System Study for Capacitor Requirement in Northern Region for the year 2016-17 and 2017-18.

The matter was discussed in 34th TCC and 38th RPC meetings, held on 24th & 25th Oct, 2016. It was decided that LOA should not be cancelled and the study should be carried out for the year 2017-18 and 2018-19 through CPRI. It was also decided that all the states would submit the data by 31.10.2016 for carrying out study for the period 2017-18. Subsequently, the data would be submitted for carrying out study for 2018-19.

In 133rd OCC meeting it was apprised that data for 2017-18 had been received from all the utilities and the same was already sent to CPRI. It was also informed that CPRI had sought some clarification regarding UPPTCL data, due to which CPRI could not carry out study. CPRI was asked to carry out the study, based on available information as UPPTCL did not submit the clarifications on time CPRI has submitted the report for 2017-18 and same is available on NRPC website (www.nrpc.gov.in).

In the 134th OCC meeting the report was deliberated and it was decided that the study result by CPRI needs further discussion. OCC had recommended for approval of capacitor schemes proposed for PSDF funding by Haryana, Punjab, UP and J&K, with the condition that quantum of capacitors for J&K would be limited to that to 1102 MVAR as came out of capacitor study by CPRI.

In this meeting it was intimated that the proposal of installation of capacitor by Haryana, Punjab, Uttar Pradesh and J&K for funding through PSDF was approved in the 35th TCC/39th NRPC meeting held on 1st & 2nd May, 2017 as per recommendation of OCC.

Regarding review of the capacitor study done by CPRI for 2017-18, MS, NRPC stated that members may submit their comment by 5.6.2017, POSITIVELY, so that same could be discussed in next OCC.

(Action: All utilities; Time line 5.6.2017)

12. Status of data through Automatic Meter Reading (AMR)

In the 13th NRPC meeting held on 27th June 2009, scheme of Automatic Meter Reading from Interface Meters in Northern Region was approved. It was decided that NRLDC and POWERGRID would submit the joint status report of AMR at the end of every month.

In the 34th TCC meeting, held on 24th Oct, 2016, NRLDC stated that out of 1235 interface meters, data from 973 meters was being received. Further, Site Acceptance Test (SAT) was completed and data through AMR was being regularly used by NRLDC for 764 interface meters. POWERGRID informed that the data from all the
meters will be available by January 2017. TCC and NRPC expressed concern over tardy progress of the implementation of AMR.

The issue is being discussed regularly in OCC meetings.

In the 134th OCC meeting, representative of POWERGRID raised their concern over lack of support from site in matters regarding AMR implementation.

In the 135th OCC meeting, joint report of NRLDC & POWERGRID was submitted. The same is placed at ANNEXURE II.

OCC advised all the transmission and generation Utilities to co-operate with the vendor to resolve the issues regarding ORU removal for manual downloading of data from SEMs.

(Action: All transmission and generation Utilities; Time line: Immediate)


The issue was discussed in the 33rd meeting of NRPC held on 11.11.2014 and it was suggested that CEA should evolve guidelines regarding ERS. Later, Secretary (Power), GoI vide letter dated 05.12.2014 addressed to Chief Secretaries of all the states had requested to issue directions to transmission utilities / transmission licensees to procure adequate number of Emergency Restoration Systems. The guidelines formulated by CEA for planning, procurement and deployment of Emergency Restoration System were also enclosed with that letter. Copy of the aforesaid letter was enclosed as Annexure-VIII to the agenda notes of 30th TCC & 34th NRPC meetings held on 19th & 20th March, 2015.

The matter was discussed in 34th TCC and 38th RPC meetings, held on 24th & 25th Oct, 2016 & 35th TCC/39th NRPC held on 1-2.5.2017

The updated latest status is as under:

DTL: -Order had been placed for 02 nos. of ERS. Supply expected by 15th June, 2017.

PSTCL: -Order has been placed. Supply expected by October, 2017.

UPPTCL: -Order for 02 nos. of ERS has been placed. 1 No. has been received & the other is expected to be received by end June

RRVPNL: -Proposal pending with management.

HVPNL: -In place of ERS, spare towers would be procured worth Rs Two Crore. PO issued in this regard

PTCUL: -NIT placed. Supply expected in 3 month.

HPSEBL: -No progress

BBMB: -Partner states have agreed to provide the ERS as and when required by BBMB.

J&K- Order has been placed for 2 nos. ERS.
MS, NRPC stressed upon the importance of ERS towers for restoration of the line though it was highlighted that it should not be used for the longer period as in the case of Bamnauli-Jhatiakala line. It was also opined that spare towers are not alternative to ERS and all the transmission utilities should procure 2 sets of ERS as per decision in RPC and MoP.

14. Targets fixed for Load Relief from operation of df/dt & UFR relays in Punjab – Review thereof

This agenda item was brought in the 127th OCC meeting by PSTCL. In short, PSTCL had contended that variation in their load from summer to winter was such that they were not in a position to meet targets of automatic load shedding under UFR, df/dt and SPS.

In the 127th OCC meeting, it was informed that the issue was deliberated in 5th NPC meeting held on 05.04.2016 wherein it was decided that it would suffice if NR as a whole is able to meet the desired load relief. It was decided that to work out the same, a format would be circulated to submit the load data of the feeders where UFR based load shedding scheme have been installed. For submission of data two typical scenarios of July and January were to be taken. Accordingly, the format was finalized and SLDCs were requested to furnish the information regarding automatic load shedding under UFR scheme in the prescribed. The format was enclosed at Annex – XII of the minutes of 127th OCC meeting.

The matter was under discussion in OCC meetings.

In this meeting, it was noted that Punjab, Haryana, Rajasthan, DTL and Himachal had submitted the information. UPPTCL assured that the same is under preparation and will be mailed on priority. PTCUL representative was asked to ensure that the data is submitted before next OCC meeting.

(Action: UPPTCL, PTCUL; Time line: 15.6.2017)

16. LVRT issues of wind/solar generation

It was deliberated that as per the Technical Standards for Connectivity to the Grid, (Amendment), regulations, 2012, B.2 (3) states the following:

“Wind generating stations connected at voltage level of 66kV and above shall remain connected to the grid when voltage at the interconnection point on any or all phases dips up to the levels depicted by the thick lines in the following curve:
Provided that during the voltage dip, the individual wind generating units in the generating station shall generate active power in proportion to the retained voltage;

Provided further that during the voltage dip, the generating station shall maximize supply of reactive current till the time voltage starts recovering or for 300ms, whichever time is lower.

Further as per the regulation, the station connected to the grid 06 months after publication of these regulation (i.e.15.04.2014) shall have the LVRT capability.

Regarding wind turbines commissioned before 15.04.2014, CERC in order dated 05.01.2016 in Petition No. 420/MP/2014 LVRT had directed that LVRT should be implemented for all wind turbines (except Stall Types) commissioned before 15.04.2014 having installed capacity equal to or more than 500 KW.

In the 36th NRPC meeting, the LVRT issue of wind/solar generation was raised wherein representative of RVPNGL stated that LVRT is being enforced for wind stations. He agreed to submit the status of LVRT for wind stations.

In 133rd OCC meeting, members expressed concern over long pending issue. RVPNGL representative intimated that the issue has been taken up with the RE generators. RVPNGL submitted the status of LVRT. As per information received from RVPNGL, it was noted that LVRT was not installed in many wind generating stations in Rajasthan.

OCC in the 135TH meeting advised Rajasthan to take up the issue with wind generators for ensuring compliance of CEA Regulations and CERC orders in this regard.

(Action: RRVPNGL; Time line: Immediate)
15. Review of Grid Operations for last month (April, 2017):

Representative of NRLDC made a presentation on grid operation during April, 2017 and highlighted the following:

- Frequency remained within the normal band 74.22% of the time during April, 2017 which is better than last year during same month (April, 2016) when frequency (within normal band) remained 69.93% of the time. Utilities were however requested to take necessary action to further improve the frequency regime viz. staggering of load at hourly boundaries, primary response from the generators etc. In CAG audit it was suggested that frequency should not go beyond 50 Hz., as it amount to wastages of costly fuel.

- Peak demand met, average demand met and minimum demand met for the region during April, 2017 was 49943 MW, 38848 MW and 25507 MW respectively. The maximum and minimum frequencies were 50.24 Hz and 49.70 Hz respectively.

- Average consumption of the Region for April 2017 increased by 4.25% (38 MU/day) of corresponding month in previous year.

- Average Thermal generation in April 2017 decreased by 4.18% (23MU/Day) of corresponding month in previous year.

- Average Hydro generation in April 2017 increased by 44.11% (65.59MU/Day) of corresponding month in previous year.

- Average nuclear generation in April 2017 increased by 1.61MU/day as compared to corresponding month in previous year.

- Average renewable generation in April 2017 increased by 10.15 MU/day as compared to corresponding month in previous year.

- Net Average Inter-Regional import decreased by 31.50 MU/day during April 2017 as compared to corresponding month in previous year.

- Net Average Import from WR decreased by 28.41 MU/day during April 2017 as compared to corresponding month in previous year.

- Net Average Import from ER increased by 10.89 MU/day during April, 2017 as compared to corresponding month in previous year.

- Total availability during April, 2017 increased by 15.67 MU/day as compared to corresponding month in previous year.

- Total outages during April 2017 were 776 including Planned Shutdown (323) and Forced outage (Trippings-271+Emergency Shutdown-182).

- The difference between data, received from SCADA and SEM in terms of %age was shown as Punjab (2.59), Rajasthan (2.79), Delhi (0.15), Uttarakhand (1.23), UP (0.93) J&K( 5.61),HP(2.55) & UT Chandigarh (2.29).

- Maximum demand met was of UP at 17332 MW a record so far.

- The list of transmission assets and generating units that were under long outage is placed at Annexure VI. All utilities were requested to update the dates of expected revival.

- Bara TPS in UP had coal shortage and in Lalitpur TPS unit was under forced outage.

- From 200 MW solar plant Bhadla, Rajasthan no telemetry to NRLDC & SLDC.

MS, NRPC emphasized need of a separate forum for dealing with issues related to renewable generation at regional level. He also highlighted that telemetry from all the renewable generators is essential and mapping of feeders connected to renewable generators must be ensured for grid reliability.
On a query by HP representative regarding telemetry provisions in HPERC direction, only for small hydro generators above 5 MW, it was clarified that as per CEA regulations telemetry is required for all grid connected generators.

16. Outlook on summer scenario: Plan and actions (Agenda by NRLDC):

Representative of NRLDC informed that Northern Region load had started following increasing trend with the rise in temperatures in northern part of country. He added that demand of northern region would further grow in coming days as temperature increases further and therefore it is necessary to take care of the important issues e.g. Load forecast along with weather monitoring, load generation balancing planning by state control areas, voltage & frequency within the band, preventive actions in case of thunder storm/sudden rainfall/load crash etc. to maintain the grid discipline during high demand period.

He further informed that these issues had been discussed in detail during the last four OCC meetings as well as in TCC & NRPC meetings held on 1st and 2nd May, 2017. He mentioned that various action plans were identified but there was no update given by any utility on the action taken.

It was brought forth that in the last OCC meetings members had been asked to make the presentation on the issues tabulated below:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Summer Preparedness</th>
<th>Plan</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Load generation balance</td>
<td>Forecasted load and Generation availability</td>
<td>Share the planning for the likely portfolio management/arrangement (STOA/PX/others). Till now average energy requirements for month are being monitored but planning for maximum energy consumption on a day is also important.</td>
</tr>
<tr>
<td>2</td>
<td>Load forecast on daily/weekly basis</td>
<td>Weather monitoring (IMD website dedicated to Northern region)/Software for load forecast/Data correlation with weather, events etc.</td>
<td>Share the load forecasting status and plan for the preventive action in case of any weather alert/events.</td>
</tr>
</tbody>
</table>
| 3     | Thunder storm | Monitoring of weather and plan to sensitize the affected station/nodes Plan load generation accordingly List of 11kV feeder that can remain connected on such eventualities | Plan for:  
- Load generation balancing management  
- Avoiding manual opening of feeder.  
- As per CEA/MoP guideline, maintaining at least 2 numbers of ERS by each state control area |
| 4     | Sudden generation outage | Plan for big generating units outage/Hydro outage on silt | Maintenance of reserves in line with CERC orders as well as for likely scenario. |
| 5     | Outage of hydro generation | Tools for silt forecasting | Staggering unit stoppage (as per protocol in case of tandem units) as well as low ramp reduction of generation. |
| 6     | Reliability | Study state control area import capability as per the summer | States shall present their import capability with observed constraints. |
scenario load generation balance and existing network. NRLDC has shared the TTC/ATC of all the state control area of NR enclosed in Annex-I of the Agenda of 135th OCC meeting

| 7 | Reactive power management | Update all the information regarding capacitor/reactor (Bus/Line/switchable), Simulation studies for tap optimization, past trend of reactive absorption/Injection based on RPC REA | Switching on capacitor as per requirements, Tap optimization based on 220kV or below ICTs HV/LV scatter plots, monitoring of generator response in absorbing/injection of reactive power, synchronous condenser operation readiness as per system requirements. |

The above mentioned issues were again discussed. Utilities were requested to share the experience regarding the utilization of the new Web Portal.

MS, NRPC highlighted that TTC/ATC calculation are very important. He advised that NRLDC should plan to coordinate a special meeting in this regard with all the concerned utilities.

Members were again advised to make the presentation in line with the above template in the next OCC meeting.

( Action: All STUs/RLDCs; Time line: 15.06.2017)

17. Feeders for physical regulation:

NRLDC representative stated that in line with IEGC and as per direction in Hon’ble CERC order in petition no. 125/MP/2012, the list of radial feeders which can be opened based on the direction of NRLDC(in addition to action by SLDC) to regulate demand has been provided by respective utilities and is part of “Operating Procedure of Northern Region”. In view of continuous network change and high demand period during summer, it is desirable to have updated list of feeders. Following are the attributes for such feeders:

- Feeders should be radial in nature
- Feeders should usually have substantial load flow so that effective change can be experienced on opening of such lines.

The list of such feeders was presented in the meeting as per the Annexure-II of the agenda of the meeting. Rajasthan and Delhi had provided information. UPPTCL and PSTCL assured in the meeting that they would submit the updated information on priority.

All other SLDCs were requested to review and update list of feeders in respect of their control area and provide the updated list by 15th June 2017.

( Action : All STUs; Time Line: 15.06.2017)
18. Heavy over drawl and Sale of Power through STOA by Himachal Pradesh, Over drawal/Under drawal by most of the NR states:

NRLDC representative stated that with the increase in temperature in Northern Region, the power demand has increased considerably and it has been observed that the states of Himachal Pradesh and Uttarakhand were excessively overdrawing from the grid. It could also be seen that while over drawing, Himachal Pradesh was also selling large quantum of power through STOA mechanism.

The representative of Himachal Pradesh explained that HP always remains surplus in power during summer/monsoon months and deficit in winter months as 85% availability of power is from own as well as Central Sector hydro generating stations. To mitigate the winter shortages, HP always resort to dispose of the summer/monsoon surpluses by way of banking and remaining surpluses, if any, by firm sale under RE mechanism. To anticipate the surpluses as well as deficits, HP considers the availability of generation of various hydro generating stations as per LGBR data of respective generator and plans firm disposal accordingly. However, in real time operations, generators could not generate as per targets of LGBR due to one or other reasons resulting into huge decline in availabilities than anticipations. As the power stands already tied up under firm arrangements well in advance and any abrupt deviation in LGBR targets forces HPSEBL to overdraw from the grid to mitigate its pre-planned firm disposals. It was also stated that during real time operations, regulations allows generators to undergo many revisions on their wish and will but the beneficiaries are debarred from such revisions and put them for perforce overdraw from the grid.

SJVNL representative informed that there had been changes in generation due to variation in water flow. And they had to revise schedule, accordingly.

NRLDC representative stated that variations in generation are bound to happen due to one or other reason but at the same time grid security must be ensured and over drawal etc. should be avoided. HP may be facing more problems due to dependence on hydro. However, he suggested that HP may tie up power with other States/thermal generators to avail power in case of reduction in hydro generation, as power is available in the market at reasonable rate.

OCC opined that though the problem faced by HP is appreciable, the State has to maintain load-generation balance and avoid continuous over-drawal for which mechanisms like spinning reserve, short-term purchase, banking etc. may be adopted. Regarding issue of provisions for revision by generators in regulations it was felt that it should be taken up with CERC for considering suitable mechanism like gate closure to minimize revisions at short notice.

HP representative assured to minimize over drawal in future.
OCC discussed at length the detailed deliberation of HP and SJVN representatives were requested to look into the issue. All other states were also advised to look into the issues of deviation and give their detailed feedback.

19. Maximize the internal generation of Northern Region in summer months:

NRLDC representative informed that Northern region meets its maximum demand in summers. Load of the Northern region is very much dependent on temperature. Demand of Northern region is expected to further increase in the upcoming days due to peak summer season. It has already crossed 51GW and expected to be more than 55GW in coming days.

It was further stated that in view of harsh summer as forecasted by IMD, high demand is anticipated in Northern region. Import of Northern region from Western region corridor is already congested. In view of this maximize internal generation of Northern region would help in meeting the peak demand of NR and put less reliance on Inter-Regional Flow. Further, incidents like Silt flushing, thunder storm also causes sudden outage of generation and load respectively.

It was stated that Average demand met had increased from 932 MU in Apr,17 to 1080MU during 1st -15th May 2017. UP demand crossed 18000MW, Delhi crossed 6000MW (on 16th May’17). It was emphasized that keeping in view limitations on TTC/ATC and to ensure reliability, maximizing internal generation by the States may be done. There should be less reliance on inter-regional imports to ensure reliability, during the stressed grid conditions.

OCC advised all the concerned utilities as well as SLDCs to ensure optimum utilization of internal generation and availability of generation as reserve to deal with contingent situations.

20. Mapping of UFR and df/dt:

NRLDC representative informed that in 132nd OCC meeting, status and data format of UFR and df/dt were shown and discussed. OCC had directed all the state control areas to submit the displays for mapping of UFR and df/dt in agreed format. He informed that Punjab, Haryana, UP, HP, Rajasthan and Delhi had made SCADA displays but it was not in proper format.

In the meeting State wise status was discussed and changes required were explained. (AnnexureII)

OCC expressed concern over delay in the work as UFR and df/dt mapping is mandatory as per Hon’ble CERC regulation. OCC advised all the concerned utilities to ensure the desired displays with all the associated data in the agreed format by 31st May,2017.

NRLDC representative stated that in addition to the SCADA mapping, States may provide following information regarding the UFR, df/dt relays installed at their respective substations:

- Source of frequency measurement for UFR, df/dt relay viz. positive sequence, phase-to-neutral, phase-to-phase.
- Computational time for measurement of frequency, rate of change of frequency in UFR, df/dt relays respectively.
All utilities were requested to give the above information

( Action: All SLDCs ;Time line: 31.05.2017)

22. Frequent forced outages of transmission elements:

NRLDC representative informed that following transmission elements were under frequent forced outages during the month of April’17:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Transmission line</th>
<th>No. of forced outages</th>
<th>Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>400kV Agra(UP)-Unnao(UP)</td>
<td>7</td>
<td>UP</td>
</tr>
<tr>
<td>2</td>
<td>800kV HVDC Agra(PG)-BiswanathCheriali (PG) pole-2</td>
<td>7</td>
<td>POWERGRID</td>
</tr>
<tr>
<td>3</td>
<td>400kV Bikaner(RRVPN)-Merta(RRVPN)</td>
<td>7</td>
<td>Rajasthan</td>
</tr>
<tr>
<td>4</td>
<td>400kV Aligarh(UP)-Muradnagar(UP) ckt-1</td>
<td>6</td>
<td>UP</td>
</tr>
<tr>
<td>5</td>
<td>400kV Muzaffarnagar(UP)-Vishnuprayag ckt-1</td>
<td>6</td>
<td>UP</td>
</tr>
<tr>
<td>6</td>
<td>400kV Muzaffarnagar(UP)-Roorkee(PG)</td>
<td>5</td>
<td>POWERGRID/UP</td>
</tr>
<tr>
<td>7</td>
<td>400kV Agra(PG)-Kanpur(PG)</td>
<td>4</td>
<td>POWERGRID</td>
</tr>
<tr>
<td>8</td>
<td>400kV Dadri(NTPC)-Panipat(BBMB) ckt-1</td>
<td>4</td>
<td>POWERGRID/NTPC/BBMB</td>
</tr>
<tr>
<td>9</td>
<td>132kV Mahendranagar(ER)-Tanakpur(NHPC)</td>
<td>4</td>
<td>POWERGRID</td>
</tr>
</tbody>
</table>

The complete details were attached at Annex-III of the Agenda of the 135TH OCC meeting. NRLDC representative stated that in some of the lines it seems from the PMU data that in many cases of single line to ground fault, the auto-reclosure had not operated. The frequent outages of such elements affect the reliability and security of the grid.

UP representative informed that issues were identified and rectification were done or under process. For 400kV Agra(PG)-Kanpur(PG) POWERGRID representative stated that action had been taken. Rajasthan representative informed that they would revert back after taking necessary action.

The issue was deliberated in the OCC meeting in detail and all the concerned utilities were requested to submit action taken along with the proper reasons for the forced outages and the remedial measures that are being taken for avoiding recurrence.

( Action: UPPTCL, RVPN, POWERGRID, NTPC ; Time line : 15.06.2017)

23. Detailed procedure for taking unit(s) under Reserve Shut Down and Mechanism for Compensation for Degradation of Heat Rate, Aux Compensation and Secondary Fuel Consumption, due to Part Load Operation and Multiple Start/Stop of Units:

NRLDC representative informed that as per discussion in 124th OCC meeting, In compliance to Regulation 6.3B.6 of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) (Fourth Amendment) Regulations, 2016, a draft procedure for taking generating unit(s) under Reserve Shut down and identifying generating
stations to be backed down up to Technical Minimum Schedule had been formulated and submitted to Hon’ble Central Electricity Regulatory Commission (CERC) by NLDC, POSOCO.

In this regard, Hon’ble Central Electricity Regulatory Commission (CERC) through its order dated 05th May 2017, had approved the detailed operating procedure (DOP) on Reserve Shut down (RSD) and approved compensation mechanism.

It was intimated that Hon’ble Central Electricity Regulatory Commission (CERC) order is available at the link below: http://www.cercind.gov.in/2017/regulation/SOR132.pdf. The Detailed Operating Procedure and the Compensation Mechanism specified in this order shall come into force from 15th May 2017.

The Salient points discussed in the meeting are attached at Annexure- IV.

24. Fifth Amendments in IEGC(Indian Electricity Grid Code) Regulation, 2017 for Technical Minimum Schedule for operation of Central Generating Stations and Inter-State Generating Stations:

NRLDC representative informed that the Fifth Amendment to IEGC, 2010 dated 12th April 2017 has been recently notified by the Central Electricity Regulatory Commission (CERC) and made available on public domain on 21st April 2017. Link of the amendment is given below:


He further informed that a letter dated 29th April 2017 has also been issued to the Northern Regional constituents for smooth implementation of the amendments. These amendments have provisions related to the changes in the existing scheduling framework which requires certain changes in the scheduling timelines and data submission. The 5th amendment to the IEGC shall come into force with effect from 01st May 2017.

The Salient points discussed in the meeting are attached at Annexure V

25. HVDC Kurukshetra-Champa: frequent outage of the Pole:

NRLDC representative informed that ±500kV HVDC Kurukshetra-Champa Pole-I (1500 MW) was commissioned in Mar’2017. Associated transmission line in NR i.e. 400kV Kurukshetra-Malerkotla D/C, 400kV Kurukshetra-Abdullapur D/C, 400kV Kurukshetra-Sonepat D/C, 400kV Kurukshetra-Jallandhar S/C, 400kV Amritsar-Malerkotla D/C & 400kV Kurukshetra-Nakodar S/C had also been synchronized. In the month of Apr and May-2017, it was reported that several times HVDC Pole-1 de-blocked or run back occurred due to CLD (Cable Longitudinal Differential Protection) operation.

He stated that HVDC Champa-Kurukshetra Pole-I is important link between WR-NR and its healthiness is very important with NR demand expected to rise in coming period.

POWERGRID representative intimated that the rectification in the system had been done. Also POWERGRID assured that they would share the logic and setting for Cable Longitudinal Protection (CLD), Status of DC line to ground fault
protection and setting of auto restart attempt of HVDC & Main and Back up protection scheme in HVDC Champa-Kurukshetra. Also it was brought forth by POWERGRID that HVDC stability would improve after commissioning of the Second Pole.

26. Deviation Violation (Agenda by NRLDC)

The deviations from the schedule are to be minimized. Some of the violations brought out by the Regulations are given below:

NRLDC representative informed the violation of regulation 7 (1) of CERC (Deviation Settlement and related matters) Regulation 2014 related to deviation from Limit on volume. It was noted that UP, Rajasthan, J&K, HP and Haryana had a number of violations as over-drawal and under-drawal during the period 01.02.2016 to 29.02.2016.

NRLDC representative had also shared the details of violation of regulation 7 (10) of CERC (Deviation Settlement and related matters) Regulation 2014 related to Sustained deviation from schedule in one direction. It was noted that Chandigarh, J&K, Delhi, HP were major defaulters.

NRLDC had also shared deviation graph of NR states for the period of 10th Apr to 10th May 2017. It was observed that many states e.g. UP, Uttarakhand, Rajasthan had large deviations from schedule, which was against the CERC Regulations.

OCC deliberated on the issue. All states were requested to control the over drawl/under drawl and avoid non-compliance of CERC regulations.

27. Updating of documents in line with Indian Electricity Grid Code (IEGC):

NRLDC representative informed that as per discussion in 133rd and 134th OCC meeting, NRLDC was in the process of updating the following document:

1. Important grid element of Northern region
2. Operating procedure of Northern region
3. Power Maps of Northern region and related information

Important Grid element and operating procedure documents are available at NRLDC website.

All the members were requested to go through the documents and provide the updated information and feedback to modify the above documents.

Some of information required for these documents is as:

i) Important Grid element of Northern region: Transmission Element added from April’16 to 15th April 2017 as per format
   1. Line, ICTs, Bus reactor, line reactor at 400kV and above
   2. ISTS and tie line at 220kV and below
   3. FSC, TCSC, SVC details
4. Generating units > 100 MW

ii) Operating procedure
   1. Feedback or modification required as per the updated CERC/CEA/other provisions.

iii) Power Map of Northern Region and related information
   1. Updated Maps of States.
   2. Information in the formats attached as Annex-IV of the Agenda of the 135th OCC meeting

It was observed in the meeting that the details were still awaited from all the constituents except Power Grid. All the concerned utilities were advised to submit the details till 15th June 2017.

The respective information may also be sent to nrldcso2@posoco.in / nrldcso2@gmail.com

NRLDC representative informed that Draft of Important Grid elements are available at following link:

http://nrldc.in/download/draft-for-important-grid-elements-northern-region-list-17may17_ver1/?wpdmdl=3441

All Constituents were requested to provide the comments latest by 24th May’17.

28. Multiple element tripping events in Northern region in the month of April-2017:

NRLDC representative informed that 33 grid events occurred in the month of April-2017. Out of these, 13 no. of events were of GD-1 category. The preliminary report of all the events have been issued from NRLDC. A list of all these events along with the status of details received is attached at Annex-V of the agenda of the 135th OCC meeting.

It was observed that a fault clearance of the order of 4000ms has been observed which is very much exceeding the standard value of 100ms. Further, despite persistent discussions/follow-up in various OCC/PCC meetings, the compliance of the regulations is still much below to the desired level.

Members were advised in the meeting to take expeditious actions to avoid such tripping in future. Moreover, utilities present in the meeting were asked to impress upon all concerned for providing the Preliminary Report, DR/EL & Detailed Report of the events in line with the regulations.

29. Details of tripping of Inter-Regional lines from Northern Region for Apr’17:

NRLDC representative stated that 28 inter-regional lines tripping occurred in the month Apr’17. The list was attached at Annex-VI of the agenda of the 135th OCC meeting. The status of receipt of preliminary reports, DR/EL within 24hrs of the event and fault clearing time as per PMU data had also been mentioned in the table.
He added that the non-receipt of DR/EL & preliminary report within 24hrs of the event is in violation of various regulations. As per regulations, all the utilities shall furnish the DR/EL, flag details & preliminary report to RLDC/RPC within 24hrs of the event. They shall also furnish the detailed investigation report within 7 days of the event if fault clearance time is higher than mandated by CEA (Grid Standard) Regulations.

It was observed that not all information regarding the tripping was received from the utilities.

**Members in the meeting were advised to take note and direct the concerned for taking corrective action to avoid such trippings as well as timely submission of the information.**

30. Frequency response characteristic:

NRLDC representative informed that Two FRC based event had occurred since last OCC meeting.

FRC observed for each state control area for the events based on the approved procedure by CERC was shared. UP submitted that RGMO implemented in 10/16 units (>200MW). In balance 6 units RGMO will be implemented after completion of R&M. Harduaganj TPS response submitted for events discussed in 134th OCC shows no response due to wide mode operation of turbine control valves.

In case of 09-May-17, Tehri informed about lack of response due to max. O/P corresponding to available head.

UP was advised to provide the station/unit wise status of RGMO/FGMO implementation and to provide the tentative date by which the same be operational in other stations.

NHPC was advised to inform about the lack of response in Chamera-3 and Dhauliganga.

**Other utilities were advised to submit the FRC of their control areas.**

NRLDC representative also informed that in 134th OCC meeting, a scheduled interaction with constituents was finalized and interaction with generators in Punjab, APCPL-Jhajjar and Faridabad gas was done. Based on the one-on-one interaction with Punjab, Haryana and other constituents, the following action points were identified:

- Healthiness of FGMO/RGMO of generators. If not implemented or out of service/order, the date from when the FGMO/RGMO is out along with the date by which the same be put in operation.
- Inclusion of action taken for improving the frequency response in FRC event details provided. Further, reason for poor frequency response to be indicated against each control area response.
- Governor droop setting, post-response ramp back criteria of generators.
- Governor being put in service when machine running on full load.

OCC appreciated efforts of NRLDC and all the utilities were requested to analyze reasons and give feedback on the issue in the interactions with NRLDC.
31. Instance of Low 220KV Grid Voltage/high MVAR at NTPC Tanda:

NTPC representative informed that it had been observed that for last many days 220 KV grid voltage often went low (around 202 - 205 KV) during evening hours, requiring all units of Station to feed very high MVAR. Since Tanda machines were consistently running at full load, this low system voltage, apart from causing undue stress to the machines, forces units to sacrifice load to feed MVAR. Such instances had been regularly intimated to SLDC on real time basis. NTPC representative had also given details of Generation loss due to this situations in 01 month period.

Various reasons for the phenomenon and options including limiting reactive power drawal at Basti, increasing reactive power generation at Obra TPS and tap optimization/commissioning of ICT at Sultanpur, to improve the voltage were discussed.

UP representative assured to take action to mitigate the problem.

32. Availability of station event logger at sub-station

NRLDC representative informed that as per clause 43.4.D of CEA Technical Standard for Construction of Electrical Plants and Electric Lines:

“Each 765 kV, 400 kV and 220 kV Line shall be provided with facility for disturbance recording, distance to fault locator and time synchronization equipment (TSE). Event logger either stand alone or as a part of sub-station or switchyard automation system shall be provided for each 220 kV and higher voltage class sub-station or Switchyard. TSE complete with antenna, all cables, processing equipment’s etc., shall be provided to receive synchronizing pulse through global positioning system (GPS) compatible for synchronizing of event logger, disturbance recorder and SCADA/Automation system of the sub- station or Switchyard.”

He added that constituents were requested to submit the status of station event logger or SAS based event logger in the given format for the 220kV and above substations in the 134TH OCC meeting in the prescribed format. However, the information was not received.

All utilities were again requested to submit information.

33. Dynamic Data of Generators:

NRLDC representative informed that as discussed earlier dynamic data of generators was to be submitted. However, information only from NHPC, Talwandi Saboo, Harduaganj Unit 7 and Kawai was received. Highlighted All utilities were requested to submit the data.

34. Split Bus Operation at Greater Noida: Table Agenda by UPPTCL

UPPTCL informed that installed capacity of 400KV Greater Noida Sub-station is 1630MVA, major load is drawn NTPC Dadri through 400KV Dadri - Greater Noida line, load is also drawn on 400KV Greater Noida - Newada line and this 400KV is the only source of supply for Greater Noida, Noida and adjoining NCR region. Load on 400KV Dadri - Greater Noida line is of the order of 1400MW and the load on 400KV Newada-Greater Noida line is of the order of 355MW. The load on UPPTCL transformers was 1130 MW.

It was highlighted that heavy drawl of load on 400KV Greater Noida - Newada line may lead to serious problems at 400KV Greater Noida and also at NTPC Dadri as current
drawn was likely to exceed the current carrying capacity of various equipments. As the weather was unusually hot, the chances of problem arising also increased. The problem had occurred in June – 2016 at NTPC Dadri and 400KV Newada could not feed the load of 400KV Sub-station, Greater Noida resulting into black out at Greater Noida for about 4hrs.

UPPTCL representative further informed that 400KV Greater Noida – Greater Noida (765KV) D/C line was under construction and due to serious ROW work of 1.52Km. line stringing was pending. The stringing work would take about 6-7 days for D/C 400KV line on Quad Moose Conductor. He requested that load on 400KV Greater Noida – Newada line be got restricted to 100MW, to avoid problems at 400KV Greater Noida or alternatively 400KV Greater Noida – Newada line may be kept open at Noida end.

OCC expressed concern over delay in commissioning of the line which is very important to relieve constraints in Greater Noida area. UPPTCL representative assured that the line would be commissioned by 15th June, 2017.

After detailed deliberation it was decided that split bus operation at Greater Noida as proposed by UPPTCL may be allowed till 20.6.2017, as a special case.

UPPTCL representative assured that the bus arrangement would be restored back immediately, in case of exigency.

It was also decided that there would not be any extension for the split bus operation beyond 20th June, 2017.

35. Underutilisation of Domestic Gas due to poor scheduling by constituents:

Table Agenda from NTPC

NTPC representative informed that after implementing provisions of CERC Regulations (IEGC 5th Amendment) w.e.f 15/05/17, NTPC gas stations schedules were also being restricted to Technical Minimum of 55%, causing severe underutilisation of domestic gas. It was emphasised that underutilisation of domestic gas is not at all appreciated by MOP&NG as this is one of the cheapest source for power generation & scarcely available. Such underutilisation may result in diversion of cheaper domestic gas meant for NR constituents to some other sectors.

Due to poor scheduling, NTPC had to stop Auraiya station on 17/05/17 early morning as the station was facing difficulty in maintaining load below 90 MW with 1GT+ST configuration. Instead, Faridabad station was started as Haryana scheduled its dedicated station in an efficient manner.

NTPC representative requested all the constituents for maximising scheduling in respect of available on-bar capacity on domestic gas.

It was also mentioned that Compensation Mechanism Percentages for Heat Rate & APC deterioration in respect of Gas Stations are yet to be finalised whereas the Tech Min of 55% had already been enforced by NRLDC.

NTPC requested to take a note of the same & requested to ensure that gas station compensation is calculated from 15/05/17, itself whenever finalised. Beneficiaries should also be aware that at 55% loading, there would substantially high impacts on ECR of gas stations.

OCC advised all the constituents to optimally schedule gas based stations.

Regarding calculation of compensation it was decided that it would be as per CERC direction.
## NORTHERN REGION SCHEMES FUNDED FROM PSDF

### Annexure I

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>State/UT</th>
<th>No. of Scheme</th>
<th>Scope of Work(Scheme)</th>
<th>Approved Cost</th>
<th>Grant Sanctioned</th>
<th>Date of Sanction</th>
<th>Funds Released</th>
<th>% of fund Disbursed against grant Sanctioned</th>
<th>Status Updated in the meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jammu &amp; Kashmir</td>
<td>2</td>
<td>Renovation and Upgradation of protection system in the substations of Jammu.</td>
<td>140.04</td>
<td>140.04</td>
<td>28/10/2015</td>
<td>0.00</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Renovation and Upgradation of protection system of substations of Kashmir area.</td>
<td>146.12</td>
<td>146.12</td>
<td>17/03/2016</td>
<td>0.00</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Punjab</td>
<td>2</td>
<td>Installation of Bus bar protection scheme in the state of Punjab.</td>
<td>18.21</td>
<td>16.39</td>
<td>17/03/2016</td>
<td>0.00</td>
<td>0.00%</td>
<td>New Tenders are to be floated</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Provision of Second DC Source at 220kV &amp; 132kV Grid Sub Stations of PSTCL.</td>
<td>15.30</td>
<td>13.78</td>
<td>2/1/2017</td>
<td>0.00</td>
<td>0.00%</td>
<td>Will update before next OCC meeting</td>
</tr>
<tr>
<td>3</td>
<td>Himachal Pradesh</td>
<td>1</td>
<td>Renovation and Upgradation of protection system of substations of HPSEBL.</td>
<td>55.44</td>
<td>55.44</td>
<td>5/1/2016</td>
<td>0.00</td>
<td>0.00%</td>
<td>Himachal representative intimated LOA stands issued.</td>
</tr>
<tr>
<td>4</td>
<td>Uttarakhand</td>
<td>1</td>
<td>Renovation and Upgradation of protection system of substations of PTCUL.</td>
<td>125.05</td>
<td>125.05</td>
<td>17/03/2016</td>
<td>0.00</td>
<td>10.00%</td>
<td></td>
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<tr>
<td>5</td>
<td>Haryana</td>
<td>1</td>
<td>Renovation and Modernization of distribution</td>
<td>364.27</td>
<td>273.2</td>
<td>5/9/2016</td>
<td>0.00</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>State</td>
<td>DCU</td>
<td>Description</td>
<td>Amount 1</td>
<td>Amount 2</td>
<td>Date</td>
<td>Amount 3</td>
<td>Percent</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------------------</td>
<td>------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>Rajasthan</td>
<td>2</td>
<td>Renovation and Upgradation of protection system of 220kV and 400kV substations in the state of Rajasthan in order to rectify Protection related deficiencies.</td>
<td>159.53</td>
<td>143.58</td>
<td>31/12/2014</td>
<td>10.79</td>
<td>7.51%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Installation of 1 no each new 400kV, 125MVAR Bus Type Shunt Reactor at 400kV Hindaun and 400kV GSS Merta City, alongwith shifting of 400kv, 50MVAR Bus Type shunt reactor from 400kV Merta City to 400kV Bhilwara and associated bays at these stations.</td>
<td>23.87</td>
<td>21.48</td>
<td>31/12/2014</td>
<td>6.45</td>
<td>30.03%</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Delhi</td>
<td>1</td>
<td>Rectification and Upgradation of protection system and replacement of outlived equipments in DTL substations</td>
<td>125.98</td>
<td>113.38</td>
<td>17/03/2016</td>
<td>11.34</td>
<td>10.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LOA stands issued of 7 CRORES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Northern Regional Power Committee (NRPC)</td>
<td>1</td>
<td>Study program on the integration of renewable energy resources of NRPC</td>
<td>6.45</td>
<td>6.45</td>
<td>28/10/2015</td>
<td>4.49</td>
<td>69.61%</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Uttar Pradesh</td>
<td>3</td>
<td>Installation of Capacitors banks in the state of Uttar Pradesh in order to improve Voltages</td>
<td>39.29</td>
<td>35.36</td>
<td>11/5/2015</td>
<td>7.76</td>
<td>21.95%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>UPPTCL intimated that on account of location change</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Renovation and Upgradation of Protection and control Systems, UFR Mapping and Islanding scheme in the state of Uttar Pradesh to rectify Protection related deficiencies 202.94 182.65 11/5/2015 38.03 20.82%

Reconductoring of 11 Nos of 132kV Lines of the state network of UPPTCL for Relieving Congestion 80.00 60.00 17/03/2016 0.00 0.00%

**Schemes Approved in the Appraisal Committee Meeting held on 17.4.2017**

<table>
<thead>
<tr>
<th>S.No</th>
<th>State/UT</th>
<th>Name of the Scheme</th>
<th>Cost Estimated by Entity</th>
<th>Approved Cost</th>
<th>Grant Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>RRVPN Rajasthan</td>
<td>Smart Transmission Operation Management System (STOMS)</td>
<td>Orig: 29.95 Rev: 13.54</td>
<td>13.18</td>
<td>11.87 90%</td>
</tr>
<tr>
<td>2.</td>
<td>RRVPN Rajasthan</td>
<td>Communication Backbone “Smart Transmission Network &amp; Asset Management System”</td>
<td>586.87</td>
<td>569.77</td>
<td>170.93 (30%)</td>
</tr>
</tbody>
</table>
The status of AMR system for the sample week 10-05-2017 is as follows:

- No of Energy meters for which AMR is commissioned presently: **1254**
- No of Energy meters for which data is received at NRLDC: **1066**
- Total locations as per LOA/phase-I: **220 locations**
- Total locations for which data is received: **187 locations**
- No of DCUs online: **221**
- No of DCUs offline: **24**
- Total locations for which SAT(Site acceptance test) is completed till date: **200 locations** (i.e. 1254 SEMs)

The balance energy meters are offline due to following issues:

1. Communication issues due to bad GPRS network.

2. ICU/ORU related Issues: SEM which are not having RS485 port, is being integrated with ICU (Interface converter unit) wherein ORU (optical reading unit) is placed on SEM. Provision of data downloading is provided in ICU and it is already advised to all utilities at each & every location that ORU shall not be removed for manual downloading of data from SEM.

During recent visit to Auraiya NTPC on 20.04.2017 it was noticed that all the ORUs have been removed from SEMs and placed it on ICU. The same issue is suspected in the other NTPC stations, Narora NPCIL, Panipat BBMB and Shree cement.

3. Generators schedule: Approximately 30 nos. SEMs are under shutdown due to scheduling of generator which restrict AMR system to communicate with SEM.

4. Around 47 Meters are offline due to Meter Replacement/Shutdown etc.

(Powergrid) (NRLDC) (Kalkitech)
<table>
<thead>
<tr>
<th>States</th>
<th>UFR mapping in SCADA</th>
<th>df/dt in SCADA</th>
<th>As per format</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>Yes</td>
<td>Yes</td>
<td>Partial</td>
<td>Other end feeder telemetry not tabulated. Alternate feeder name/telemetry is missing. Digital CB status is missing.</td>
</tr>
<tr>
<td>Haryana</td>
<td>Yes</td>
<td>Yes</td>
<td>Partial</td>
<td>Telemetry not available for few feeders. Feeder wise planned load relief is missing. Other end feeder telemetry is missing. Alternate feeder name/telemetry is missing. Only stg-1 Df/dt feeder details are mapped.</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>No</td>
<td>Yes</td>
<td>Partial</td>
<td>Digital CB status is missing. Alternate feeder/telemetry is missing. Station end feeder telemetry is missing. UFR mapping is yet to be completed</td>
</tr>
<tr>
<td>Delhi</td>
<td>Yes</td>
<td>Yes</td>
<td>Partial</td>
<td>Feeder name, Feeder wise planned load relief, Other end feeder telemetry, Alternate feeder name/telemetry are missing. Stage wise segregation of feeders is missing.</td>
</tr>
<tr>
<td>UP</td>
<td>Yes</td>
<td>Yes</td>
<td>Partial</td>
<td>Feeder wise planned load relief (in UFR display), Other end feeder telemetry, Alternate feeder name/telemetry, Digital CB status are missing.</td>
</tr>
<tr>
<td>HP</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Alternate feeder name/telemetry is missing</td>
</tr>
</tbody>
</table>
• **Detailed procedure for taking unit(s) under Reserve Shut Down and Mechanism for Compensation**

• **Salient points:**
  
  – All the generating stations shall submit following additional information for scheduling purpose:
    
    • On Bar Installed Capacity (MW)
    
    • No. of Units on bar
    
    • On Bar Declared Capacity (MW) (with due consideration to ramp up/down capability)
    
    • Ramp UP/ Ramp DOWN rate (MW/min) for On Bar Installed Capacity

• **Salient points:**
  
  – In accordance with 5th amendment to IEGC, 2010, the schedule of any generating station shall be restricted to On Bar Installed Capacity less Normative Auxiliary consumption.

  – The generators shall ensure to keep maximum number of units on bar. For e.g. if there are 5 machines of 200 MW (after deducting auxiliary consumption) in a generating station and the total requisition received is 550 MW then the generator shall run all five machines at 55% technical minimum level i.e. 110 MW. This is important to ensure sufficient hot spinning reserves in the system and availability of primary response in real time.

  – The generators shall make all efforts to keep machines on bar if the schedule is below technical minimum in some time blocks during a day. In case, it is not possible to keep all the machines on bar and a unit is to be taken out on RSD, then the requisition from the beneficiaries shall be reduced in the ratio of requisitioned power.

• **Salient points:**
  
  – All the beneficiaries shall ensure that technical minimum schedule is provided to each generating station.

  – In case the schedule falls below the technical minimum level then RLDCs may provide technical minimum schedule to the generating station in accordance clause 6.5.14 and 6.5.20 of IEGC in the ratio of under-requisitioned quantum for better system operation.
In such scenario, it is possible that the requisition of some beneficiaries may go up to ensure technical minimum. In this case, SLDCs may surrender power from some other inter-State generating station(s) or intra-State generating station(s) based on merit order after ensuring that after surrendering of power, the schedule does not fall below technical minimum level.

• Salient points:

  – All the generators shall ensure that the Off Bar DC is not more than the MCR less Normative Auxiliary Consumption of the machines under RSD.

  – In case the machine goes under RSD, the generating unit shall ensure that the machine is available after 8hrs for coal based and 3hrs for gas based generating station.

  – The generating unit shall be revived either for better system operation in accordance with IEGC clause 6.5.14 and 6.5.20 or on the request of one or more beneficiary with at least technical minimum schedule for 8hrs for coal based and 3hrs for gas based generating station.
IEGC Fifth Amendment

**TimeLine:**
- 12-Apr-17 : Notified by Hon’ble commission.
- 21-Apr-17 : Made available on public domain.
- 29-Apr-17 : Letter issued to the constituents for smooth implementation of the amendments.
- 01-May-17 : 5th amendment shall come into force.

- These amendments have provisions related to the changes in the existing scheduling framework which requires certain changes in the scheduling timelines and data submission.

- **Spinning Reserves:** the Capacities which are provided by devices including generating station or units thereof synchronized to the grid and which can be activated on the direction of the System Operator and effect the change in active power.

- Clauses under part 5 (IEGC) w.r.t. governor primary response:
  - There should not be any reduction in generation in case of improvement in grid frequency to a level below 50.05Hz.

- Clauses under part 6 (IEGC) w.r.t. :
  - By 8 AM every day, the ISGS shall advise the concerned RLDC, the station-wise ex-power plant MW and MWh capabilities foreseen for the next day, i.e., from 0000 hrs to 2400 hrs of the following day.
  - The above information of the foreseen capabilities of the ISGS and the corresponding MW and MWh entitlements of each State, shall be compiled by the RLDC every day for the next day, and advised to all beneficiaries by 10 AM. The SLDCs shall review it vis-à-vis their foreseen load pattern and their own generating capability including bilateral exchanges, if any, and advise the RLDC by 3 PM their drawal schedule for each of the ISGS in which they have shares, long-term and medium-term bilateral interchanges, approved short term bilateral interchanges.
<table>
<thead>
<tr>
<th>SL.No</th>
<th>Element Name</th>
<th>Type</th>
<th>Voltage Level</th>
<th>Owner</th>
<th>Date</th>
<th>Time</th>
<th>Reason / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Parbati pool(PG) - Parbati(3)(NHPC) bypassing Parbati(2)</strong></td>
<td>Line</td>
<td>400 kV</td>
<td>PKTCL</td>
<td>13-04-2017</td>
<td>10:58</td>
<td>Construction of new element --- for disconnecting by-pass system at Parbat II and making final arrangement to connect the lines at Parbati II HEP as requested by NHPC ( as confirmed by NHPC that Parbati II HEP m/c is being ready for evacuation in a day or two).After final arrangement/connections this lines shall be made as 400kv Parbati III HEP - Parbati II HEP and Paebati Pool(PG)-Parbati II HEP.</td>
</tr>
<tr>
<td>2</td>
<td><strong>Merta 50 MVAR (400kV) B/Reactor 1</strong></td>
<td>Bus Reactor</td>
<td>400 kV</td>
<td>RRVPNL</td>
<td>15-04-2017</td>
<td>10:41</td>
<td>Construction of new element --- for dismantling this 50 MVAR Bus Reactor(this reactor shall be shifted to 400kv Bhilwara) and replacing/commissioning with new TEBA make 125 MVAR Bus Reactor at Merta .</td>
</tr>
<tr>
<td>3</td>
<td><strong>Akal 400 kV Bus 2</strong></td>
<td>BUS</td>
<td>400 kV</td>
<td>RRVPNL</td>
<td>19-04-2017</td>
<td>11:10</td>
<td>General maintenance -- required for stringing of twin moose to quad moose of Jack Bus.</td>
</tr>
<tr>
<td>4</td>
<td><strong>Makhu 80 MVAR B/Reactor 1</strong></td>
<td>Bus Reactor</td>
<td>400 kV</td>
<td>PSEB</td>
<td>2/5/2017</td>
<td>12:37</td>
<td>General maintenance --- periodical testing and maintenance and summar preparedness.</td>
</tr>
<tr>
<td>5</td>
<td><strong>FSC of Pampore-2 at Kishnpr</strong></td>
<td>FSC</td>
<td>220 kV</td>
<td>PGCIL</td>
<td>30-10-2012</td>
<td>12:00</td>
<td>Line length has reduced after LILO work completion</td>
</tr>
<tr>
<td>6</td>
<td><strong>FSC of Pampore-1 at Kishnpr</strong></td>
<td>FSC</td>
<td>220 kV</td>
<td>PGCIL</td>
<td>30-10-2012</td>
<td>12:00</td>
<td>Line length has reduced after LILO work completion</td>
</tr>
<tr>
<td>7</td>
<td><strong>765 kV (3*110) 330 MVAR Line Reactor (Non-Switchable) of Unnnao ckt 1 at Anpara D TPS</strong></td>
<td>Line Reactor</td>
<td>765 kV</td>
<td>UPPTCL</td>
<td>13-04-2017</td>
<td>18:19</td>
<td>Due to not completion of 765 kV Line Anpara D</td>
</tr>
<tr>
<td>SL.No</td>
<td>Element Name</td>
<td>Type</td>
<td>Voltage Level</td>
<td>Owner</td>
<td>Outage Date</td>
<td>Outage Time</td>
<td>Reason / Remarks</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------------------</td>
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<td>---------------</td>
<td>--------</td>
<td>-------------</td>
<td>-------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>Bamnauli(DTL)-Jatikala(PG) 1</td>
<td>Line</td>
<td>400 kV</td>
<td>DTL</td>
<td>22-05-2016</td>
<td>20:29</td>
<td>Tower damage (First dead end tower from Bamnauli S/S) / Ckt-II charge through ERS tower</td>
</tr>
<tr>
<td>10</td>
<td>Anpara 100 MVA ICT 2</td>
<td>ICT</td>
<td>400/132 kV</td>
<td>UPPTCL</td>
<td>15-02-2017</td>
<td>20:25</td>
<td>DGA test values are poor</td>
</tr>
<tr>
<td>11</td>
<td>Sarnath 50 MVAR B/R</td>
<td>Bus Reactor</td>
<td>400 kV</td>
<td>UPPTCL</td>
<td>16-02-2009</td>
<td>6:14</td>
<td>Failure of Reactor</td>
</tr>
<tr>
<td>12</td>
<td>Wagoora 50 MVAR B/R</td>
<td>Bus Reactor</td>
<td>400 kV</td>
<td>PGCIL</td>
<td>22-04-2015</td>
<td>18:56</td>
<td>Take out due to low voltage.</td>
</tr>
<tr>
<td>13</td>
<td>FSC (50%) of Koteswar Pool - 2 at Meerut (PG)</td>
<td>FSC</td>
<td>400 kV</td>
<td>PGCIL</td>
<td>16-07-2015</td>
<td>13:01</td>
<td>Fire in FSC-2 at Meerut.</td>
</tr>
<tr>
<td>14</td>
<td>FACT at BLB in Knp-BLB Line</td>
<td>FACTS</td>
<td>400 kV</td>
<td>PGCIL</td>
<td>2/7/2016</td>
<td>10:20</td>
<td>Y-Phase current imbalance</td>
</tr>
<tr>
<td>15</td>
<td>Bhiwani-Jind 1</td>
<td>Line</td>
<td>400 kV</td>
<td>PGCIL</td>
<td>7/3/2017</td>
<td>21:43</td>
<td>Opened on H/V</td>
</tr>
<tr>
<td>16</td>
<td>Ajmer II-Didwana</td>
<td>Line</td>
<td>400 kV</td>
<td>RRVPNL</td>
<td>30-04-2017</td>
<td>22:48</td>
<td>Opened on H/V</td>
</tr>
<tr>
<td>SL. No</td>
<td>Station</td>
<td>Location</td>
<td>Owner</td>
<td>Unit No</td>
<td>Capacity</td>
<td>Reason(s)</td>
<td>Outage</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------</td>
<td>------------</td>
<td>---------</td>
<td>---------</td>
<td>----------</td>
<td>---------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>1</td>
<td>RAPS-A</td>
<td>RAJASTHAN</td>
<td>NPC</td>
<td>1</td>
<td>100</td>
<td>Subject to regulatory clearance</td>
<td>9/10/2004</td>
</tr>
<tr>
<td>2</td>
<td>Dehar HPS</td>
<td>HP</td>
<td>BBMB</td>
<td>6</td>
<td>165</td>
<td>Renovation work.</td>
<td>21-03-2014</td>
</tr>
<tr>
<td>3</td>
<td>Badarpur TPS</td>
<td>DELHI</td>
<td>NTPC</td>
<td>2</td>
<td>100</td>
<td>Order of NGT for Environmental protection</td>
<td>24-09-2015</td>
</tr>
<tr>
<td>4</td>
<td>Badarpur TPS</td>
<td>DELHI</td>
<td>NTPC</td>
<td>3</td>
<td>100</td>
<td>Order of NGT for Environmental protection</td>
<td>9/10/2015</td>
</tr>
<tr>
<td>5</td>
<td>Badarpur TPS</td>
<td>DELHI</td>
<td>NTPC</td>
<td>1</td>
<td>100</td>
<td>Order of NGT for Environmental protection</td>
<td>30-10-2015</td>
</tr>
<tr>
<td>6</td>
<td>Bhakra-L HPS</td>
<td>HP</td>
<td>BBMB</td>
<td>5</td>
<td>108</td>
<td>Replacement of Generator Shaft</td>
<td>12/4/2016</td>
</tr>
<tr>
<td>7</td>
<td>Bhakra-R HPS</td>
<td>HP</td>
<td>BBMB</td>
<td>1</td>
<td>157</td>
<td>Annual maintenance</td>
<td>9/11/2016</td>
</tr>
<tr>
<td>8</td>
<td>Obra TPS</td>
<td>UP</td>
<td>UPRVUNL</td>
<td>7</td>
<td>100</td>
<td>R &amp; M work</td>
<td>1/7/2010</td>
</tr>
<tr>
<td>9</td>
<td>Obra TPS</td>
<td>UP</td>
<td>UPRVUNL</td>
<td>12</td>
<td>200</td>
<td>Annual maintenance</td>
<td>1/10/2016</td>
</tr>
<tr>
<td>10</td>
<td>NAPS</td>
<td>UP</td>
<td>NPC</td>
<td>2</td>
<td>220</td>
<td>Electrical system fault</td>
<td>5/4/2017</td>
</tr>
<tr>
<td>11</td>
<td>Giral (IPP) LTPS</td>
<td>RAJASTHAN</td>
<td>RRVUNL</td>
<td>1</td>
<td>125</td>
<td>Bad materials leakage.</td>
<td>11/7/2014</td>
</tr>
<tr>
<td>12</td>
<td>Giral (IPP) LTPS</td>
<td>RAJASTHAN</td>
<td>RRVUNL</td>
<td>2</td>
<td>125</td>
<td>Boiler tube leakage</td>
<td>27-01-2016</td>
</tr>
<tr>
<td>13</td>
<td>Jhajjar-CLP (IPP) TPS</td>
<td>HARYANA</td>
<td>HPGCL</td>
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<td>660</td>
<td>Boiler tube leakage</td>
<td>2/3/2017</td>
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<tr>
<td>14</td>
<td>Lalitpur TPS</td>
<td>UP</td>
<td>LPGCL</td>
<td>3</td>
<td>660</td>
<td>Generator Transformer protection operated</td>
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<tr>
<td>15</td>
<td>Talwandi Sabo TPS</td>
<td>PUNJAB</td>
<td>PSEB</td>
<td>2</td>
<td>660</td>
<td>Earlier out on less demand, now constraint due to fire at coal handling plant</td>
<td>5/4/2017</td>
</tr>
<tr>
<td>16</td>
<td>Anpara TPS</td>
<td>UP</td>
<td>UPRVUNL</td>
<td>2</td>
<td>210</td>
<td>Boiler tube leakage</td>
<td>6/4/2017</td>
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</table>
Outages of Generating Units due to less demand/less gas availability as on 16.05.2017 {Total 3936 MW = CS (1721)+SS(2215)MW}

<table>
<thead>
<tr>
<th>SL. No</th>
<th>Station</th>
<th>Location</th>
<th>Owner</th>
<th>Unit No</th>
<th>Capacity</th>
<th>Reason(s)</th>
<th>Outage Date</th>
<th>Time</th>
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<tbody>
<tr>
<td>1</td>
<td>Anta GPS</td>
<td>RAJASTHAN</td>
<td>NTPC</td>
<td>1</td>
<td>88.71</td>
<td>Less gas availability</td>
<td>18-11-2016</td>
<td>14:28</td>
</tr>
<tr>
<td>2</td>
<td>Faridabad GPS</td>
<td>HARYANA</td>
<td>NTPC</td>
<td>2</td>
<td>137.75</td>
<td>Less gas availability</td>
<td>21-02-2017</td>
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<tr>
<td>3</td>
<td>Anta GPS</td>
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<tr>
<td>5</td>
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<td>19:03</td>
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<tr>
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<td>8</td>
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<td>156</td>
<td>Less Gas Availability</td>
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<td>15:37</td>
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<td>Less Demand</td>
<td>11/5/2017</td>
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</tbody>
</table>
## Outages of Generating Units due to less demand/less gas availability as on 16.05.2017

<table>
<thead>
<tr>
<th>S.No</th>
<th>Station</th>
<th>Location</th>
<th>Owner</th>
<th>Unit No</th>
<th>Capacity</th>
<th>Reason(s)</th>
<th>Outage</th>
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</thead>
<tbody>
<tr>
<td>14</td>
<td>Bawana GPS</td>
<td>DELHI</td>
<td>DTL</td>
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<td>8/1/2016</td>
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<tr>
<td>15</td>
<td>Bawana GPS</td>
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<td>DTL</td>
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<tr>
<td>16</td>
<td>Paricha TPS</td>
<td>UP</td>
<td>UPRVUNL</td>
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<td>Less Demand in UP</td>
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<tr>
<td>17</td>
<td>Guru Nanak Dev TPS (Bhatinda)</td>
<td>PUNJAB</td>
<td>PSEB</td>
<td>1</td>
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<td>Less Demand in Punjab</td>
<td>21-08-2016</td>
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<td>18</td>
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<td>PUNJAB</td>
<td>PSEB</td>
<td>2</td>
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<td>Less Demand in Punjab</td>
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<tr>
<td>19</td>
<td>Guru Nanak Dev TPS (Bhatinda)</td>
<td>PUNJAB</td>
<td>PSEB</td>
<td>4</td>
<td>110</td>
<td>Less Demand in Punjab</td>
<td>5/10/2016</td>
</tr>
<tr>
<td>20</td>
<td>Panipat TPS</td>
<td>HARYANA</td>
<td>HPGCL</td>
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<tr>
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<tr>
<td>22</td>
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<td>PSEB</td>
<td>3</td>
<td>210</td>
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<tr>
<td>23</td>
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<td>PSEB</td>
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<td>210</td>
<td>Less Demand in Punjab</td>
<td>7/1/2017</td>
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<tr>
<td>24</td>
<td>Guru Gobind Singh TPS (Ropar)</td>
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<td>PSEB</td>
<td>5</td>
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<tr>
<td>25</td>
<td>Suratgarh TPS</td>
<td>RAJASTHAN</td>
<td>RRVUNL</td>
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<td>Less Demand in Rajasthan</td>
<td>7/5/2017</td>
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</table>
### List of members of OCC

<table>
<thead>
<tr>
<th>Organization</th>
<th>Members</th>
</tr>
</thead>
</table>
| Adani PL.    | (i) Sh. Nirmal Sharma, VP (O&M), Fax- 0141-2292065  
(ii) Sh. Sameer Ganju, Head-Northern Region, Fax No. 011-24115560 |
| APCPL        | (i) AGM (O&M)-I, IGSTPP, Fax No. 01251-266326  
(ii) AGM (EEMG), 01251-266326 |
| BBMB         | (i) Director (PR) Fax- 0172-2652820  
(ii) Power Controller, Fax- 0172-2653297. |
| HVPNL        | Chief Engineer (Comm.); SE (SO & SLDC): 0181-2664440 Fax-0172-2560622 |
| NHPC         | (i) Sh. Janardan Choudhary, E.D., Faridabad – Fax-0129-2272413  
(ii) Sh. S.P. Singh, Chief Engineer (O&M), Faridabad – Fax-0129-2272413 |
| POWERGRID    | (i) Sh. Prabhakar singh, ED (NR-I), Fax No. 011-26853488  
(ii) Sh. A.K. Arora, General Manager (O&M), NR-I,  
(iii) Sh. R.V. Kushwaha, General Manager (O&M), Jammu; Fax- 0191-2471187  
(iv) Sh. Rajeev Sudan Dy, General Manager (OS), Fax- 0191-2471187 |
| RRVUNL       | Sh. P.S Arya, Chief Engineer (PPMC & IT), Fax- 0141-2744006 |
| NTFC         | (i) Head of OS/ Head of RCC, Fax No. 0120-2410082  
(ii) Sh. Praveen Chaturvedi, GM (OS), NRHQ Lucknow; Fax-0522-2305849. |
| HPSEBL       | (i) Sh Suniel Grover, Chief Engineer (SO &P), Fax No. 0177-2653656  
(ii) Sh. Deepak Uppal, SE (PR & ALDO); Fax-0177-2837143 |
| NRLDC        | General Manager - 26854861, 4051, 26569504 Fax- 26852747 |
| NLDC         | General Manager, NLDC, Fax: 011-26853488/26601079 |
| Lanco APTL   | Sh. Raj Kumar Roy, Director, Fax: 0124-2341627/4714024 |
| SJVNL/NJHPS  | General Manager (C&SO), Fax- 0177-2673283 |
| PTCL/UPCL    | (i) Sh. Anupam Sharma, SE (SLDC), Fax- 0135-2451160, 0135-2763570 |
| UPPTCL       | (i) Director (Op), Fax- 0522-2286476  
(ii) Chief Engineer (SLDC), Fax- 0522-2287880, 2288736 |
| HPLDS        | (i) Sh. N.P. Sharma, SE, SLDC, Fax: 0177-2837649  
(ii) Sh. Lokesh Thakur, Executive engineer, Fax: 0177-2837649 |
| DTL          | General Manager (SLDC)/ General Manager (Protection) Fax-23236462, 23221069 |
| THDCIL       | Sh. U.C. Kannaujia, AGM (EMD), Tehri, Fax- 0135-2438682 |
| PSTCL        | (i) Sh. S.S. Mal, Chief Engineer (SLDC) Fax – 0175-2365340  
(ii) Sh. D.P. Sethi, Dy. Chief Engineer (SLDC) Fax – 0175-2365340 |
| IPGCL/PPCL   | (i) Sh. Y.P. Arora, GM (T), IPGCL, New Delhi, Fax- 23370884  
(ii) Sh. R.K. Yadav, DGM (T), IPGCL, New Delhi, Fax- 23370884 |
| BRPL         | Sh. Satinder Sondhi, VP & Head System Operations, Fax No. 011-39996549 |
| Everest PPL  | Sh. Yogendra Kumar, Chief Operating Officer, Fax No. 011-45823862/ 43852507 |
| RPSCL        | Sh. Niranjan Jena, Addl.VP/ Sh. Suvendu Dey, Asst. VP-O&M, Fax: 05842-300003 |
| HPCL         | Sh. S.K. Wadhwa SE/Technical(HQ), Fax: 0172-5022436 |

### From organizations which are yet to submit revised nominations

<table>
<thead>
<tr>
<th>Organization</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPPTCL</td>
<td>Director (Planning &amp; Contracts), Fax: 0177-2626284</td>
</tr>
<tr>
<td>J&amp;K (PDD)</td>
<td>Chief Engineer (Survey &amp; Commercial) Fax-0191-2476213</td>
</tr>
<tr>
<td>J&amp;K SDPLC</td>
<td>GM, Fax: 0194-2500145</td>
</tr>
<tr>
<td>PSPCL</td>
<td>Engineer-in- Chief (PPRR), Fax- 0175-2308698.</td>
</tr>
<tr>
<td>RRVPNL</td>
<td>Chief Engineer (LD); SE (SO&amp;LD) – Fax- 0141-2740920</td>
</tr>
<tr>
<td>UPRVUNL</td>
<td>DGM (TOM), 0522-2287861</td>
</tr>
<tr>
<td>UJVNLS</td>
<td>General Manager Engineering: 0135-2761485, fax- 0135-2761549</td>
</tr>
</tbody>
</table>
| CEA          | Director, (GM-I), Fax- 26170385, 26108834  
Chief Engineer, NPC |
| NPCIL        | (i) Station Director, NAPS; Fax. 05734-222177,(ii) Sr. Manager (Transmission), NCPILFax.-022-2556350 |
| JPPVL        | Sh. Suresh Chandra, Director, Fax- 0120-4516201/4609464/4609496 |
| Jhajjar PL   | Sh. Goutam Biswas, GM (Production), 01251-270155. |

**New Members for the year 2016-17 (Nominations not received)**

Uttar Haryana Bijli Vitaran Nigam Ltd.  
Jodhpur Vidyut Vitrana Nigam Ltd.