



सत्यमेव जयते

भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

उत्तर क्षेत्रीय विद्युत समिति

Northern Regional Power Committee

सं: उ.क्षे.वि.स./प्रचालन/106/01/2020/2798-2839

दिनांक: 13/03/2020

विषय: प्रचालन समन्वय उप-समिति की 169^{वीं} बैठक का कार्यसूची ।

Subject: Agenda of 169th OCC meeting.

प्रचालन समन्वय उप-समिति की 169^{वीं} बैठक का आयोजन वीडियो कॉन्फ्रेंसिंग के माध्यम से एन.आर.पी.सी. के नई दिल्ली स्थित कार्यालय से पूर्वाह्न 10:00 बजे से दिनांक 17.03.2020 को किया जाएगा । उक्त बैठक की कार्यसूची उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट <http://www.nrpc.gov.in> पर उपलब्ध है।

169th meeting of the Operation Co-ordination sub-committee will be conducted through Video Conferencing from NRPC Secretariat, New Delhi at 10:00 Hrs on 17.03.2020. The agenda of this meeting has been uploaded on the NRPC web-site <http://www.nrpc.gov.in>.

It is requested that the updated status of various points under follow-up action points of previous OCC meeting may kindly be furnished prior to the meeting.

Kindly make it convenient to attend the meeting.

(सौमित्र मजूमदार)

अधीक्षण अभियंता (प्रचालन)

सेवा में : प्रचालन समन्वय उप समिति के सभी सदस्य।

To : All Members of OCC

1. Confirmation of Minutes

The minutes of the 168th OCC meeting which was held on 18.02.2020 and 19.02.2020 at NRPC Secretariat, New Delhi were issued vide letter of even number dated 05.03.2020.

Comment from HVPN

i. Agenda 3

SLDC Haryana vide e-mail dated 09.03.2020 has intimated that the information related to SLDC Haryana as brought out in the minutes portrays a wrong image of availing rate of shutdowns by Haryana due to software issues at NRLDC end. The correct figures according to SLDC Haryana are as given below:

Entity	Planned	Non-Planned	Emergency	Total Approvals	Extra entries (repeated entries) due to software error	D-3 requests	Actual approvals	% D-3 requests
SLDC-Haryana	112	0	5	117	101	10	16	93.75

ii. Table agenda: Voltage Dip problem at 220kV M/s Maruti Substation

Haryana representative stated that 220 kV Maruti substation (MSIL) was test charged on 19.11.2019 and 50/60 MVA, 220/11 kV Transformer 2 was put in the service on 18.12.2019. M/s MSIL informed to HVPNL that they are facing voltage dips problems at 220kV voltage level, which is causing operational issues in their plant.

Some of the events as mentioned below were brought out to the OCC forum.

OCC advised NRLDC to look into the issue and suggest remedial measures to be taken so as to avoid power quality issues being experienced by M/s Maruti Ltd.

TIME		As Per SLDC System				As Per Maruti				Remarks
		Duration	Voltage (Before)- KV Phase Voltage	Voltage (After)- KV Phase	% dip	Duration	Voltage (Before)-	Voltage (After)-	% dip	
from	to									
2019-12-27 02:12:48.520	2019-12-27 02:12:48.600	80 ms	246	221	10.162602	60	240	221	7.92%	Ballabgarh_PG-MaharaniBagh ckt was closed as per SOE
2019-12-28 00:27:38.960	2019-12-28 00:27:39.080	120 ms	248	163	34.274194	80	240	163	32.08%	At that time multiple element tripped at 400kv Bawana(DTL) due to Y-N fault.
2019-12-28 15:50:37.000	2019-12-28 15:50:37.120	120 ms	237	213	10.126582	80	231	200	13.42%	Jaipur South_PG-Bassi Ckt was opened at thst time as per SCADA SOE.
2019-12-30 05:52:13.920	2019-12-30 05:52:14.040	120ms	242	218	9.6858106	100	237	205	13.50%	-

TIME		As Per SLDC System				As Per Maruti				Remarks
		Duration	Voltage (Before)- KV Phase Voltage	Voltage (After)- KV Phase	% dip	Duration	Voltage (Before)-	Voltage (After)-	% dip	
from	to									
2020-01-02 16:22:13.640	2020-01-02 16:22:13.720	80ms	239	235	1.6736402	90	232	214	7.76%	No any transients have been observed neither on 220kv Side nor on 400kv side.
2020-01-05 07:21:00.000	2020-01-05 07:21:59.960	-	241	241	0	131	233	212	9.01%	No any transients have been observed. Voltage was slightly increased but it was in steady state condition.
2020-01-08 11:49:20.200	2020-01-08 11:49:20.520	-	234	234	-0.190611	100	225	206	8.44%	
2020-01-12 05:55:37.200	2020-01-12 05:55:37.320	120ms	239	219	8.3682008	100	224	196	12.50%	
2020-01-13 04:45:28.360	2020-01-13 04:45:28.880	520ms	244	222	9.0163934	100	239	212	11.30%	Operation being done at Dhanonda-Dadibana Ckt.
2020-01-13 16:39:44.640	2020-01-13 16:39:44.920	280ms	240	234	2.5	350	234	188	19.66%	
2020-01-15 09:17:48.240	2020-01-15 09:17:48.400	160ms	232	208	10.344828	380	225	161	28.44%	Daultabad-Manesar Ckt. 2 was tripped at that time.
2020-01-22 20:49:35.480	2020-01-22 20:49:35.600	120ms	242	211	12.809917	50	234	208	11.11%	Ballabgarh-Tuglakabad ckt. Was closed as per SOE.

*Data has been taken from Ballabgarh Substation due to Gurugram_pg data not available.

The sub-committee may kindly deliberate and confirm the Minutes.

2. Review of Grid operations of February 2020

2.1 Supply Position (Provisional) for February 2020

Anticipated Power Supply Position v/s Actual Power Supply Position (Provisional) of Northern Region during the month of February 2020 is as given below:

State	Req. / Avl.	(MU)			(MW)		
		Anticipated	Actual	Variation	Anticipated	Actual	Variation
Chandigarh	Avl.	105	106	1.0%	295	269	-8.8%
	Req.	115	106	-7.8%	235	269	14.5%
Delhi	Avl.	3300	1905	-42.3%	4810	4447	-7.5%
	Req.	1890	1905	0.8%	4400	4447	1.1%
Haryana	Avl.	5090	3689	-27.5%	9860	7520	-23.7%
	Req.	3560	3689	3.6%	6950	7520	8.2%
Himachal Pradesh	Avl.	1010	821	-18.7%	1600	1742	8.9%
	Req.	870	823	-5.4%	1590	1742	9.6%
UTs of J&K and Ladakh	Avl.	670	1458	117.6%	1860	2526	35.8%
	Req.	1620	1816	12.1%	3190	3158	-1.0%
Punjab	Avl.	5470	3544	-35.2%	9000	7169	-20.3%
	Req.	3550	3544	-0.2%	7000	7169	2.4%
Rajasthan	Avl.	8220	7147	-13.1%	14940	14277	-4.4%
	Req.	6860	7153	4.3%	12700	14277	12.4%
Uttar Pradesh	Avl.	8000	8009	0.1%	16000	16627	3.9%
	Req.	7850	8115	3.4%	16000	16777	4.9%

State	Req. / Avl.	(MU)			(MW)		
		Anticipated	Actual	Variation	Anticipated	Actual	Variation
Uttarakhand	Avl.	1060	1065	0.5%	2100	2233	6.3%
	Req.	1090	1065	-2.3%	2180	2233	2.4%
NR	Avl.	32925	27743	-15.7%	60465	50158	-17.0%
	Req.	27405	28215	3.0%	48100	51106	6.2%

As per above, negative / significant variation ($\geq 5\%$) in Actual Power Supply Position (Provisional) vis-à-vis Anticipated figures is observed for the month of February 2020 in terms of Energy Requirement for Chandigarh, Himachal Pradesh, UTs of J&K and Ladakh, Punjab and Uttarakhand and in terms of Peak Demand similar variation is noted for Chandigarh, Haryana, Himachal Pradesh, UTs of J&K and Ladakh, Rajasthan. **These states/UTs are requested to submit reason for such variations so that the same can be deliberated in the meeting.**

All SLDCs are requested to furnish provisional and revised power supply position in prescribed formats on NRPC website portal by 2nd and 15th day of the month respectively for the compliance of Central Electricity Authority (Furnishing of Statistics, Returns and Information) Regulations, 2007.

2.2 Power Supply Position of 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 January 2020 is placed on NRPC website. (<http://nrpc.gov.in/operation-category/power-supply-position/>).

3. Maintenance Programme of Generating Units and Transmission Lines

3.1. Maintenance Programme for Generating Units

The meeting on proposed maintenance programme for Generating Units for the month of April 2020 is scheduled on 16.03.2020 at NRPC Secretariat, New Delhi.

3.2. Outage Programme for Transmission Elements.

The meeting on proposed outage programme of Transmission lines for the month of April 2020 is scheduled on 16.03.2020 at NRPC Secretariat, New Delhi.

4. Planning of Grid Operation

4.1. Anticipated Power Supply Position in Northern Region for April 2020

The Anticipated Power Supply Position in Northern Region for April 2020 is enclosed at **Annexure-A.I.**

SLDCs are requested to update their estimated power supply position for April 2020 and measures proposed to be taken to bridge the gap between demand & availability, as well to dispose of the surplus, if any, in the prescribed format.

5. Submission of breakup of Energy Consumption by the states

Following status on the submission of energy consumption breakup was discussed:

State	Period of submitted data	Submitted in specified format or not
Rajasthan	Apr'18 – Jan'20	Yes
Punjab	Apr'18 – Oct'19	Yes
Uttar Pradesh	Apr'18 – Nov'19	Yes
Haryana	Apr'18 – Nov'19	No
Himachal Pradesh	Apr-18 – Mar'19	No

All the remaining states/UTs viz., Delhi, Uttarakhand, UTs of J&K and Ladakh and Chandigarh are requested to submit the requisite data w.e.f. April 2018 as per the billed data information in the format given as under:

Category →	Consumption by Domestic Loads	Consumption by Commercial Loads	Consumption by Agricultural Loads	Consumption by Industrial Loads	Traction supply load	Miscellaneous / Others
<Month>						

Haryana and HP to submit the information in the prescribed format.

6. System Study for Capacitor Requirement in NR for the year 2019-20

- 6.1 OCC members expressed concerns regarding the progress of the study during the deliberations in the 168th OCC meeting.
- 6.2 The forum decided in the meeting to form a Sub-Group of all the SLDC representatives of NR, NRLDC and NRPC Secretariat to look into the reasons for extraordinary delay in the execution of the project and explore whether an alternate approach of maintaining power factor greater than 0.9 may be adopted rather than going for entire capacitor requirement study.
- 6.3 In view of the outbreak of COVID-19, the nominations for the sub-group and its meeting could not take place.
- 6.4 All SLDCs are requested to send their nominations positively before 17.03.2020 so that meeting of the sub-group could be held at the earliest and the issue could be resolved.

All SLDCs may update.

7. Phase nomenclature mismatch issue with interconnected stations

- 7.1. Based on the duly signed information obtained from Rajasthan, BBMB, Punjab, UP, Delhi, Haryana about the locations having phase nomenclature mismatch, a detailed deliberation was held in the 168th OCC meeting.
- 7.2. OCC was of the view that the issue is only related to mismatch of phase nomenclature and there is no electrical mismatch of phases. Thus, the decision already taken in 142nd OCC meeting should be adopted and the nomenclature

mismatch should be clearly brought out while reporting.

- 7.3. However, on request of NRLDC for forming a committee to assess the quantum of work and formulate the action plan for rectification of the issue as a whole, it was decided to constitute a committee under the chairmanship of NRLDC with representatives from NRPC Secretariat, POWERGRID, Rajasthan, BBMB and Himachal Pradesh. OCC advised that the committee may submit its findings before 169th meeting of OCC.

NRLDC may kindly update.

8. Follow up of issues from previous OCC Meetings – Status update

The updated status of Agenda items is enclosed at **Annexure-All**.

All utilities are requested to update the status.

9. SPS for ICTs at 765 kV Unnao sub-station

In 168th OCC meeting, UPSLDC informed that certain modifications were required in the scheme post the mock test of 30.01.2020. OCC advised UPSLDC to conduct the mock test after making necessary modifications on 26.02.2020

UPSLDC may update.

10. Automatic Demand Management System

- 10.1. The status of implementation of ADMS which is mandated in Clause 5.4.2 (d) of IEGC by SLDCs/SEB/DISCOMs is presented below:

State/ Utility	Status
Punjab	Not fully implemented. At SLDC level, remote tripping of 100 feeders at 66 kV is possible. At 11 kV feeder level, ADMS is to be implemented by Distribution Company. As per the information available with SLDC, for 50 feeders of 11 kV at Amritsar and Ludhiana, scheme was under finalization.
Delhi	Fully implemented by TPDDL, BRPL and BYPL. NDMC implementation delayed and would be completed by 31.03.2020. May kindly update.
Rajasthan	Under implementation. LoA placed on 12.12.2018 with an execution period of 18 months for ADMS at the level of 33 kV feeders at EHV Substation of RVPN under SCADA / EMS part of project. ADMS functionality at 11 kV feeders from 33/11 kV substation is under the jurisdiction of the DISCOMs and matter is being perused with DISCOMs authorities
UP	Not fully implemented.

State/ Utility	Status
	Remote operation of 50 feeders at 132 kV level being operated from SLDC. For the down below network, issue taken up with the DISCOMs.
Haryana	Not implemented.
HP	02 feeders could be operated from SLDC through manual intervention. Letter has been sent by HPSEB to HP-SLDC for making its operation automatic.

10.2. **Punjab SLDC:** M/s Siemens informed that separate Hardware/software/applications would be required for implementing ADMS on 66 kV feeders where remote control (through SCADA) facility was available. M/s Siemens has submitted the tentative cost for implementation of ADMS and the same is under consideration.

10.3. **UP SLDC:** M/s Siemens informed that implementation of ADMS scheme is feasible and UP SLDC is taking positive steps on the proposal.

Members may update the status of implementation of scheme.

11. **Approval of Electrical Inspector for replacement works (agenda by UPSLDC)**

Considering the difficulties being faced by the STUs and CTU for replacement works, 168th OCC advised all STUs to submit their concerns in writing to MS, NRPC for taking it further with the competent authority for necessary amendments in the regulations.

Further, all the STUs and CTU were advised to seek time from Chairperson, CEA and express their concern so as to seek quick redressal of the difficulties being faced.

However, no communication in this regard has been received from any of the STUs or CTU.

Members may deliberate.

12. **Islanding Schemes of NR**

As per CEA the Grid Standards Regulations 2006 and the IEGC (1st amendment) Regulations 2012, RPCs have been mandated to prepare islanding schemes and ensure its implementations. Islanding schemes of NAPS, RAPS-A & B and Delhi have been approved in the past NRPC meetings. Moreover, islanding scheme for Kashmir valley is under proposal stage.

For the proper functioning of the approved islanding scheme at the time of exigency, review and testing of schemes at regular interval is needed. Moreover, as per the recommendation of the enquiry committee on grid disturbance on 30.07.2012 & 31.07.2012, State Load Dispatch Centers / State Transmission Utilities along with the

generating stations in their area should explore the possibility of formation of various islands.

Members may deliberate on the review and testing of approved islanding schemes and possibility of implementing additional islanding schemes in Northern Region.

खण्ड-ख: उ.क्षे.भा.प्रे.के.

Part-B NRLDC

13. Summer preparedness 2020

Demand of Northern Region is likely to increase from March 2020 onwards with increase in temperature. Summer of Northern region are typically hot and demand is also high during this time, therefore advance actions help in better grid operation.

Following important points may help in smooth grid operation especially during the coming summer:

S. No.	Issues	Action plan	Action by
1	<p>Maintenance of reserves</p> <p>During summer, in anticipation of increasing demand, adequate reserves shall be maintained.</p> <p>During summer, sudden outage of hydro units on silt or other major generation outage affects frequency/voltage, line loading, reliability and security of the corridor/control area/Generation complex etc.</p> <p>In events of sudden load crash, ISGS generators are being instructed to back down to 55% of their installed capacity. However, amongst states only UP state controlled generators are seen to be backing down upto 55%, which ensures that sufficient reserves are available to cater any variation in demand.</p>	<p>In such cases, apart from portfolio management based on proper forecast as discussed above, re-starting of units under reserve shutdown at state as well as Inter-state level through appropriate transactions is required.</p> <p>Moreover, display window showing reserve available in ISGS generators has been developed at NRLDC. SLDCs are also requested to arrange for such display window at their control centers so that system operators readily know quantum of reserve available and hence better real-time actions can be taken.</p> <p>Other states are also requested to take actions to ensure backing down of generators to 55% of their capacity in case of critical situations. This would ensure reserves in the system and also make us prepared for extreme situations.</p>	NRLDC, SLDCs, Generators
2	<p>Furnishing of coal stock position</p> <p>Advance information of coal stock of thermal plants ensures generating units availability and it is very important during high demand season.</p>	<p>It has been observed in past years that sudden information of outage of thermal units on coal unavailability pose challenges to meet high demand. It is therefore requested to update & share coal stock position of thermal plants at least a week in advance as agreed earlier in TCC/NRPC meeting.</p>	Generators, SLDCs

S. No.	Issues	Action plan	Action by
3	<p style="text-align: center;">Portfolio Management, load staggering</p> <p>As discussed in previous OCC meetings states such as Rajasthan and Haryana continue to connect/disconnect large quantum of load at hourly boundaries resulting in frequency spikes and instantaneous over voltages. This has also resulted in tripping of lines on overvoltage in recent past.</p>	<p>Apart from LTA/MTOA/STOA/Market arrangements based on forecast, other short term arrangements should also be planned for real time imbalances. For example, adequate margin while scheduling own thermal generation, units on bar, maintenance of reserves, technical minimum operation of thermal units in case of load crash, tie up with neighbor states or hydro rich states etc. to bridge the load-generation gap in real time.</p> <p>In view of high/increasing demand & transmission constraints (if any) in importing the power or in case of any contingency in the system, states are requested to maximize their internal generation to avoid low frequency/low voltage operation or other related issues.</p>	SLDCs
4	<p style="text-align: center;">Tower Strengthening and availability of ERS</p> <p>There have been number of instances of tower collapse & damage in the past during such thunder storms which resulted in constraints in supply power for extended duration of time.</p> <p>Number of tower collapse incidents occurred during last summer also in May/Jun'19 in which many EHV lines out on tower collapse along with important lines. Apart from EHV line outage on tower collapse, nearly 30-40 lines were opened manually to control high voltage.</p>	<p>The tower strengthening and availability of Emergency Restoration System (ERS) [for early restoration of supply] have been observed as mitigation tools for such scenario: Each utility shall work on plan for tower repairing work before April.</p> <p>Extra precautions need to be taken care for important lines which have history of tripping during thunderstorm/windstorm.</p> <p>220kV Chamera-III - Chamba Pool needs to be revived at the earliest. During monsoon, HP has plans to evacuate additional power from Bajoli Holi (120-140MW) through this corridor in addition to Chamera-III and Budhil generation.</p>	STUs and POWERGR ID
5	<p style="text-align: center;">Reactive power management</p> <p>Over previous several summer months, it has been observed that voltage profile during summer has improved.</p>	<p>To maintain the voltage profile of Grid within IEGC band during summer, following known actions are suggested:</p> <ol style="list-style-type: none"> i. Switching ON Capacitor/Switching OFF reactor as per system requirement ii. Tap Optimization at 400/220kV by NRLDC and 220/132kV by respective state control area based on scatter plots of ICTs, offline studies, NRPC 	NRLDC, SLDCs

S. No.	Issues	Action plan	Action by
		RE account etc. iii. Dynamic reactive support from Generator as per their capability curve. iv. Synchronous condenser operation [in case water can be stored] v. SCADA Displays for better visualization	
6	<p style="text-align: center;">Defense Mechanism</p> <p>Several defense mechanism has been recommended by various committees and advantages of such defense schemes have been discussed in many fora too. Majority of defense mechanism are to cover protection for under voltage, under frequency, rate of change of frequency, SPS for line/ICTs loading/generator complex evacuation etc.</p>	<p>Till date it has been observed that performance of SPS is considerably low. Accurate operation of SPS is very essential and hence, mapping of SPS in SCADA is also being done. It is pertinent to mention here that SPS is only for operational defense and should not be considered as long term solution. It is suggested that all state control area/Users shall ensure before start of summer that their protection and defense system are in working conditions and settings are as per the recommendations of NRPC. In addition, all states/user need to provide update for changes or modifications carried out if any.</p>	Transmission utilities (STU/ISTS) and SLDCs
7	<p style="text-align: center;">Telemetry</p> <p>It has been observed number of times, that telemetry of large nos of stations is affected during contingency, inclement weather, or in day to day switching operations etc.</p>	<p>Such unavailability of data especially during switching or contingency, hampers the fast action at control centers. Therefore, all are requested to ensure the telemetry of all analog & digital points of all stations at respective control centers. Large number of issues are encountered with new elements. Recently, many new substations/elements have been commissioned in J&K etc. telemetry of which is either not available or not reliable.</p>	SLDCs STUs

14. Computation of TTC/ATC of respective control areas

NRLDC has done preliminary studies for assessing the TTC/ATC of large state control area for upcoming summer as per information available at NRLDC. Before summer season, each state shall assess and share its ATC/TTC as agreed earlier and as per CERC regulations. TTC/ATC of summer 2020 and constraints expected this summer are given below:

State	Tentative TTC during Summer-20 (MW)	Constraints anticipated	Actions required
Punjab	<p>State own generation= 6500 MW (High hydro)</p> <p>TTC= 7000 MW (on managing the load locally at Rajpura and Amritsar ICTs)</p> <p>ATC= 6400 MW (Considering reliability margin as 600 MW)</p>	<p>N-1 compliance issues at Rajpura, Amritsar, Dhuri and Makhu ICTs</p> <p>Many 220kV lines near Amritsar(PG) and Ludhiana(PG) are also critically loaded</p> <p>TTC figure is dependent on the quantum of generation at higher voltage level like Talwandi and Rajpura. Less generation at these stations would assist in drawing more interstate power.</p>	<ul style="list-style-type: none"> • Increase in generation at 220kV level would help in meeting high demand & also improve voltage profile. • New 220kV lines may be planned and existing network reorganised to relieve the loading on ICTs and to meet loads through paths that are less loaded.
UP	<p>State own generation = 10600 MW</p> <p>TTC= 13700 MW</p> <p>ATC= 13100 MW (Considering reliability margin as 600 MW)</p>	<p>N-1 compliance issue at Mau, Sarnath, Allahabad(PG) ICTs. N-1 non-compliance at 765/400kV Fatehabad ICTs under high generation at Lalitpur TPS.</p> <p>Many 220 kV lines like Bareilly-Dohna, Bareilly-CB Ganj and Meerut-Modipuram are critically loaded.</p>	<ul style="list-style-type: none"> • Expedite commissioning of underlying n/w at recently commissioned 765kV & 400kV stations to reduce loading on other heavily loaded lines and ICTs
Delhi	<p>State own generation = 600MW</p> <p>TTC= 6800 MW</p> <p>ATC= 6500 MW (Considering RM as 300 MW)</p>	<ul style="list-style-type: none"> • N-1 compliance issue at Bamnoli, Harshvihar and Mandola ICTS and 220 kV Ballabgarh-BTPS lines 	<ul style="list-style-type: none"> • Loading on 220 kV Harsh Vihar - Preet Vihar - Patparganj to be monitored closely and new arrangements to feed the load to be worked on
Haryana	<p>TTC: 7600</p> <p>ATC: 7000</p>	<ul style="list-style-type: none"> • N-1 non-compliance at Kirori, Deepalpur, Panipat (BBMB) and Abdullapur ICTs • 220kV lines from Hisar, Lula ahir, Abdullapur etc. are heavily loaded 	<ul style="list-style-type: none"> • 220kV Hisar(PG)-Hisar(IA), 220kV lines from Lula ahir, 220kV Abdullapur-Jorian and other 132kV lines are heavily loaded and need to be strictly monitored. • Alternate arrangement for reducing loading on above lines need to be expedited.

State	Tentative TTC during Summer-20 (MW)	Constraints anticipated	Actions required
Rajasthan	(Generation : 8500MW) TTC: 5400 ATC: 4800 (Generation : 6000MW) TTC: 6800 ATC: 6200	<ul style="list-style-type: none"> • N-1 contingency of Phagi, Jodhpur, Merta, Bikaner, Hindaun and Ratangarh ICTs • High loading of ICTs at Akal and need for reactive power support 	<ul style="list-style-type: none"> • Expedite commissioning of 3rd ICT at Phagi • New ICT to be planned at Jodhpur and Akal • Expedite commissioning of 400kV Rajwest-Barmer # 2 bays at Barmer end by RRVPNL

States are requested to regularly compute TTC/ATC figures and manage loading to ensure N-1 compliance for elements under their jurisdiction. Members may please discuss.

15. Grid Operation Related Issues

15.1. Charging of lines without NRLDC code

List of important elements of the regional grid, which have a bearing on the network security, is compiled and issued by NRLDC as a separate document [IEGC 5.2 (c)]. The document is available on NRLDC website at following <https://nrldc.in/download/nr-important-grid-elements-may-2019/?wpdmdl=6854>.

In Operating procedure document of Northern region, which was published after discussion with all stakeholders in OCC meeting, it is mentioned that:

“The regional entities, users, STU, CTU, licensee shall obtain ‘Operation code’ from NRLDC before carrying out any switching operation on any of the important elements of the Northern Regional grid.”

Recently, it was observed that several elements were revived without taking code from NRLDC. This is clear violation of IEGC as well as procedure agreed in Operating procedure document.

400 kV Bawana - Mundka ckt 1: On 9 March 2020, 400 kV line Bawana - Mundka ckt 1 tripped at 01:57 Hrs and the line was restored without prior intimation and without taking operating code from NRLDC by Delhi SLDC at 06:21hrs of 09th Mar 2020.

400 kV Bawana CCGT-Bawana (DTL) ckt-2: The interconnector line 400 kV Bawana CCGT-Bawana (DTL) tripped at 14.48 Hrs on 11/02/2020 and it was charged without availing NRLDC code at 17.55hrs on 11/02/2020.

765 kV Aligarh-Orai ckt-1: 765kV Aligarh-Orai ckt-1 tripped at 22.12hrs on 29/02/2020 and it was charged without availing NRLDC code at 22.23 Hrs on 29/02/2020. Same line was again tripped at 22.40 Hrs on 29/02/2020 and was charged without availing NRLDC code at 23:34 Hrs on 29/02/2020.

400 kV Bareilly Shahjahanpur ckt-1: 400 kV Bareilly Shahjahanpur tripped at 11.32 Hrs on 09/03/2020 and was charged without availing NRLDC code at 12.05 Hrs 09/03/2020.

3×110 MVar Line Reactor of 765 kV Bikaner (end)-Moga ckt-2: The line reactor was opened at 09.02 Hrs at 07/03/2020 without taking NRLDC code.

220kV Badarpur-Ballabgarh ckt-2: on 8th March 2020, 220kV Badarpur-Ballabgarh-2 was charged from both ends without NRLDC code.

These are clear violations of IEGC/Operating procedure of NR. NRLDC communication in this regard is attached as **Annexure-B.1.**

On 9th March 2020, 400kV Parbati3- Banala line shut down code NR/1870 was issued on dt.09.03.2020. But, 400kV Parbati2- Banala line was opened during operation from Banala S/S at 09:42 hrs. This is clear case of non-seriousness by control room operators. Such instances may pose severe threat to life as well as grid operation.

Thus, it is necessary that control room operators be once again directed to operate the system in co-ordination with NRLDC after following proper operating procedure and be alert while performing switching operations.

15.2. High voltages in the grid

From past few weeks very high voltages are being observed at several 765kV as well as 400kV nodes in the grid. Several measure which help in controlling high voltages in the grid were discussed in previous OCC as well as TCC/NRPC meetings and are also listed below:

- (i) Switch off capacitor & switch in all BR/LR wherein high voltage persists
- (ii) Generator reactive power absorption, SVC operations, Synchronous condenser operation especially of Hydro units
- (iii) Tap optimization at 400/220kV & below voltage levels by NRLDC and SLDCs respectively
- (iv) Opening of EHV lines based on studies considering reliability & security of system

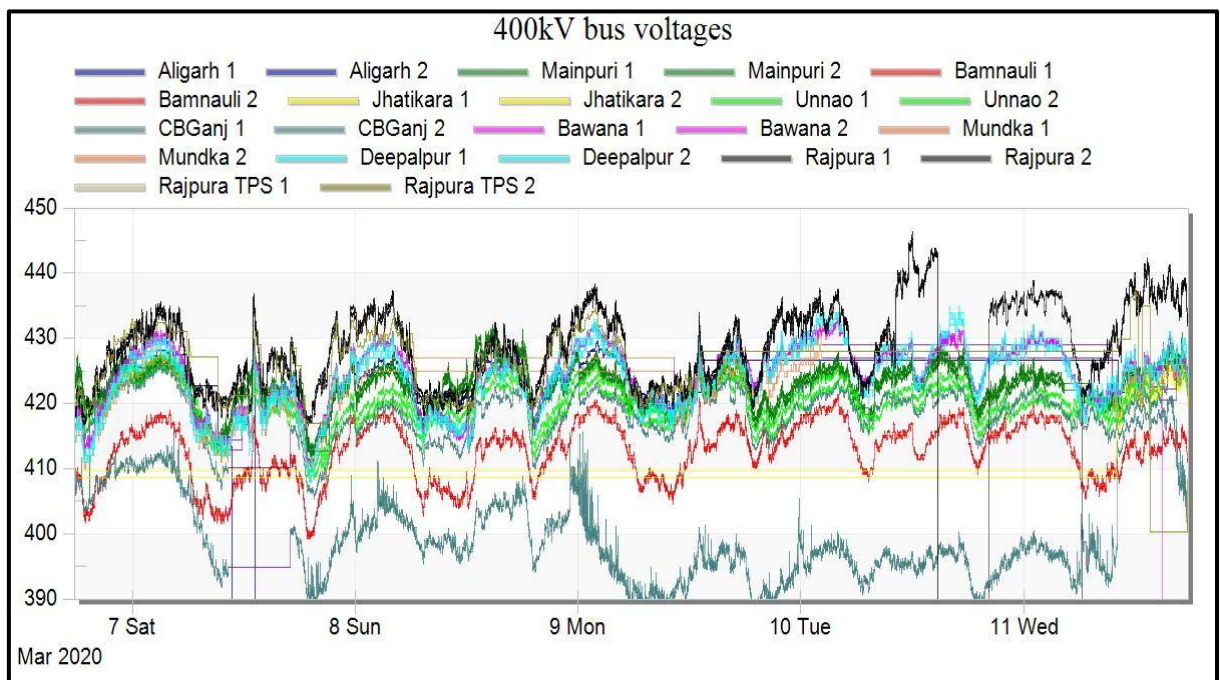
Even after optimising resources at RLDC level, it also necessary that actions are being taken at SLDC/Discom level to control high voltages. List of lines which tripped on overvoltage, ICTs which tripped on over flux is attached as **Annexure-B.2.**

From the list it could be observed that following elements have tripped frequently in March 2020:

- 400 KV Aligarh-Mainpuri (UP) Ckt-1
- 400 KV Bamnoli(DV)-Jhatikara(PG) (DV) Ckt-1
- 400 KV Bareilly-Unnao (UP) Ckt-1
- 400 KV Bawana-Mundka (DV) Ckt-1
- 400 KV Dadri(NT)-Maharanibagh(PG) (PG) Ckt-1
- 400 KV Deepalpur(JHKT)-Bawana(DV) (PG) Ckt-1

- 400 KV Rajpura TPS(PSG)-Nakodar(PSG) (PS) Ckt-2
- 400 KV Rajpura TPS(PSG)-Rajpura(PS) (PS) Ckt-1
- 400/220 kV 315 MVA ICT 1 at Makhu(PS)
- 400/220 kV 315 MVA ICT 4 at Daulatabad(HV)
- 400/220 kV 500 MVA ICT 3 at Dhuri(PS)
- 400/220 kV 500 MVA ICT 3 at Rajpura(PS)

In several cases, overvoltage as well as over flux trippings seem to occur at much below the standard settings. Bus voltage data available at NRLDC suggests voltages generally were not that high which could have resulted in overvoltage trippings.



Thus, it is necessary to make sure that settings are correct. Members may like to discuss measures like reset ratio in over voltage protection, CVT measurement error, tripping of line from one end only and absorption of reactive power by generator etc. that could be taken for minimizing these trippings on over voltages.

15.3. MVAR performance of generators

Following was agreed in 44th TCC / 47th NRPC meeting and 165th and 166th OCC meetings:

- All generators (including intrastate) shall absorb MVAR as per capability curve
- Reactive power support performance and MVAR telemetry issues will be reviewed in monthly OCC meetings.
- Reactive power capability testing will be carried out after discussion in OCC meeting.

Reactive power response of generating stations is being regularly discussed in OCC meetings.

Reactive power response in respect of MVAR vs Voltage for past 30 days (12.02.2020 - 12.03.2020) as per NRLDC SCADA data is enclosed as **Annexure-B.3** in agenda. Based on available data, it is observed that there are margins available as per capability curves for most of the generating stations. In addition, telemetry (sign and magnitude of MVAR) of various state generating station is yet to be corrected.

It was agreed in previous OCC meetings that states shall also develop MVAR vs voltage plots for generators under their jurisdiction. This would also help to improve telemetry of MVAR data and eventually, more reliable MVAR vs voltage plots will be available.

In the last OCC meeting, Koteshwar (THDC) was asked to share MVAR data from their end and if required reactive power capability testing of Koteshwar may be carried out along with site visit planned for dedicated bus coupler bay allocation at Koteshwar. THDC may kindly update.

Members may like to discuss.

16. Frequent forced outages of transmission elements in the month of February 2020

Following transmission elements were frequently under forced outages during the month of February 2020:

Sl. No.	Element Name	No. of forced outages	Utility/SLDC
1	400 KV Bawana(DV)-Mundka (DV) Ckt-1	7	Delhi
2	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2	7	Rajasthan/NPC
3	400 KV Aligarh(UP)-Sikandrabad (UP) Ckt-2	4	UP
4	400 KV Bareilly(UP)-Unnao (UP) Ckt-1	4	UP
5	400 KV Suratgarh(RVUN)-Ratangarh(RS) (RS) Ckt-2	4	Rajasthan
6	400 KV Aligarh(UP)-Mainpuri (UP) Ckt-1	3	UP
7	400 KV Aligarh(UP)-Sikandrabad (UP) Ckt-1	3	UP
8	400 KV Bareilly(UP)-Unnao (UP) Ckt-2	3	UP

Complete details are attached at **Annexure-B.4**. Frequent outages of such elements affect the reliability and security of the grid. Hence, utilities are requested to look into such frequent outages and share the remedial measures taken/being taken in this respect.

Members may like to discuss.

17. Multiple element tripping events in Northern region in the month of February 2020

A total of **11** grid events occurred in the month of Feb'20 of which 6 are 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 by 05-March-2020 is attached at **Annexure-B.5**.

Further, despite persistent discussions/follow-up in various OCC/PCC meetings, the compliance of the regulations is still much below the desired level.

Maximum Fault Duration is 2360 ms in the event of multiple element tripping at 400/220 kV Daulatabad (Haryana) on 26th February 2020 at 13:26hrs.

Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total 4 events out of 11 grid events occurred in the month.

Members may take expeditious actions to avoid such tripping in future and discuss the same. Moreover, utilities may impress upon all concerned for providing the Preliminary Report, DR/EL & Detailed Report of the events in line with the regulations.

Members may like to discuss.

18. Details of tripping of Inter-Regional lines from Northern Region for February 2020

A total of **05** inter-regional lines tripping occurred in the month of Feb'20. The list is attached at **Annexure-B.6**. Out of 05 number of trippings, no tripping incident is related to HVDC system. The status of receipt of preliminary reports, DR/EL within 24hrs of the event and fault clearing time as per PMU data has also been mentioned in the table. 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.

Members may please note and advise the concerned for taking corrective action to avoid such trippings as well as timely submission of the information.

19. Frequency response characteristic

Two FRC based event has occurred in the month of Feb-2020. Description of the events is as given below:

Sl. No.	Event Date	Time (in hrs.)	Event Description	Starting Frequency (in Hz)	End Frequency (in Hz)	Δf
1	17-Feb-20	17:38hrs	On 17 th Feb 2020, at 17:38:31.600 hrs, HVDC Talcher - Kolar pole-II got tripped due to persistent DC line fault. At this time TS1 and TS2 signal generated at Kolar	49.94	50.05	0.11

			<p>end and load relief of 1415 MW obtained in southern region as per SCADA data. It led to the frequency rise to 50.099 Hz from 49.930 Hz. Due to primary response, the frequency gone down to 50.025 Hz. Then at 17:39:58.400 hrs, Pole-I went into ground return mode and at Talcher end, signal 3 is generated. On this signal, instantaneous back down of 666 MW occurred in Talcher stg II. Consequently, the frequency dipped to 49.96 Hz from 50.07 Hz and finally settled to a higher value of 50.04 Hz. The FRC has been calculated for the load relief of 1415 MW obtained in southern region.</p>			
2	22-Feb-20	17:38hrs	<p>On 22nd Feb 2020, at 18:23:18 hrs Unit-II and Unit III at Bara station tripped. The reason of unit outage was differential protection as reported. As per Kanpur 3 phase voltage PMU, there was only single voltage dip and maximum dip is in Y-Phase. The total generation loss in the event was 1134 MW. In the event, Unit-I at Bara station remained connected and no generation was affected in it.</p>	49.96	49.90	-0.06

The Hon'ble CERC approved procedure has already been shared with all concerned during previous OCC meetings. FRC observed for each state control area for the events is tabulated below:

States	17-Feb-20 event	Remarks
PUNJAB	21%	
HARYANA	43%	
RAJASTHAN	17%	
DELHI	47%	
UTTAR PRADESH	6%	
UTTARAKHAND	-10%	
CHANDIGARH	-19%	Small Control area
HIMACHAL PRADESH	9%	
JAMMU & KASHMIR	24%	
NR	21%	

States	22-Feb-20 event	Remarks
PUNJAB	20%	
HARYANA	-25%	
RAJASTHAN	12%	
DELHI	-50%	
UTTAR PRADESH	135%	
UTTARAKHAND	-42%	
CHANDIGARH	125%	Small Control area
HIMACHAL PRADESH	112%	
JAMMU & KASHMIR	-36%	
NR	37%	

FRC calculation of ISGS stations based on NRLDC SCADA data is tabulated below:

Generator	17-Feb-20 event	Generator	17-Feb-20 event
Singrauli TPS	10%	Salal HEP	6%
Rihand-1 TPS	25%	Tanakpur HEP	-2%
Rihand-2 TPS	2%	Uri-1 HEP	2%
Rihand-3 TPS	21%	Uri-2 HEP	-12%
Dadri-1 TPS	No generation	Dhauliganga HEP	55%
Dadri -2 TPS	93%	Dulhasti HEP	18%
Unchahar TPS	0%	Sewa-II HEP	53%
Unchahar stg-4 TPS	8%	Parbati-3 HEP	No generation
Jhajjar TPS	38%	Jhakri HEP	13%
Dadri GPS	2%	Rampur HEP	112%
Anta GPS	No generation	Tehri HEP	13%
Auraiya GPS	Suspect SCADA data	Koteswar HEP	Increase in schedule
Narora APS	23%	Karcham HEP	68%
RAPS-B	23%	Malana-2 HEP	Suspect SCADA data
RAPS-C	-5%	Budhil HEP	No generation
Chamera-1 HEP	2%	Bhakra HEP	1%
Chamera-2 HEP	0%	Dehar HEP	-50%
Chamera-3 HEP	No generation	Pong HEP	7%
Bairasiul HEP	19%	Koldam HEP	Suspect SCADA data
		AD Hydro HEP	No generation
Generator	22-Feb-20 event	Generator	22-Feb-20 event
Singrauli TPS	57%	Salal HEP	1%
Rihand-1 TPS	94%	Tanakpur HEP	17%
Rihand-2 TPS	20%	Uri-1 HEP	-21%
Rihand-3 TPS	21%	Uri-2 HEP	0%
Dadri-1 TPS	No generation	Dhauliganga HEP	88%
Dadri -2 TPS	149%	Dulhasti HEP	37%
Unchahar TPS	0%	Sewa-II HEP	68%
Unchahar stg-4 TPS	-68%	Parbati-3 HEP	Suspect SCADA data
Jhajjar TPS	96%	Jhakri HEP	63%
Dadri GPS	0%	Rampur HEP	-22%
Anta GPS	No generation	Tehri HEP	Suspect SCADA data
Auraiya GPS	Suspect SCADA data	Koteswar HEP	Suspect SCADA data
Narora APS	-16%	Karcham HEP	91%
RAPS-B	7%	Malana-2 HEP	Suspect SCADA data
RAPS-C	37%	Budhil HEP	No generation
Chamera-1 HEP	178%	Bhakra HEP	0%
Chamera-2 HEP	0%	Dehar HEP	7%
Chamera-3 HEP	2%	Pong HEP	2%
Bairasiul HEP	9%	Koldam HEP	133%
		AD Hydro HEP	No generation

FRC calculation of major state generators based on NRLDC SCADA data is tabulated below:

Generator	17-Feb-20 event	Generator	17-Feb-20 event
PUNJAB		UP	
Ropar TPS	No generation	Obra TPS	Suspect SCADA data
L.Mohabbat TPS	No generation	Harduaganj TPS	27%
Rajpura TPS	40%	Paricha TPS	-2%
T.Sabo TPS	0%	Rosa TPS	13%
Goindwal Sahib TPS	No generation	Anpara TPS	-2%
Ranjit Sagar HEP	14%	Anpara C TPS	69%
Anandpur Sahib HEP	2%	Anpara D TPS	No generation
HARYANA		Bara TPS	-43%
Panipat TPS	1%	Lalitpur TPS	10%
Khedar TPS	-12%	Meja TPS	No generation
Yamuna Nagar TPS	No generation	Vishnuprayag HEP	No generation
CLP Jhajjar TPS	7%	Alaknanda HEP	Suspect SCADA data
Faridabad GPS	Suspect SCADA data	Rihand HEP	No generation
RAJASTHAN		Obra HEP	No generation
Kota TPS	5%	UTTARAKHAND	
Suratgarh TPS	22%	Gamma Infra GPS	3%
Kalisindh TPS	7%	Shravanti GPS	-4%
Chhabra TPS	No generation	Ramganga HEP	Suspect SCADA data
Chhabra stg-2 TPS	-1%	Chibra HEP	19%
Kawai TPS	0%	Khodri HEP	No generation
Dholpur GPS	No generation	Chilla HEP	10%
Mahi-1 HEP	8%	HP	
Mahi-2 HEP	No generation	Baspa HEP	1%
RPS HEP	No generation	Malana HEP	No generation
JS HEP	1%	Sainj HEP	No generation
DELHI		Larji HEP	13%
Badarpur TPS	No generation	Bhabha HEP	-2%
Bawana GPS	5%	Giri HEP	3%
Pragati GPS	-2%	J&K	
		Baglihar-1&2 HEP	0%
		Lower Jhelum HEP	No generation

Generator	22-Feb-20 event	Generator	22-Feb-20 event
PUNJAB		UP	
Ropar TPS	No generation	Obra TPS	Suspect SCADA data
L.Mohabbat TPS	No generation	Harduaganj TPS	39%
Rajpura TPS	108%	Paricha TPS	79%
T.Sabo TPS	0%	Rosa TPS	90%
Goindwal Sahib TPS	No generation	Anpara TPS	-2%
Ranjit Sagar HEP	Suspect SCADA data	Anpara C TPS	60%
Anandpur Sahib HEP	-8%	Anpara D TPS	No generation
HARYANA		Bara TPS	-2714%
Panipat TPS	-1%	Lalitpur TPS	No generation
Khedar TPS	No generation	Meja TPS	No generation
Yamuna Nagar TPS	No generation	Vishnuprayag HEP	No generation
CLP Jhajjar TPS	-15%	Alaknanda HEP	Suspect SCADA data
Faridabad GPS	Suspect SCADA data	Rihand HEP	No generation
RAJASTHAN		Obra HEP	No generation
Kota TPS	17%	UTTARAKHAND	
Suratgarh TPS	-7%	Gamma Infra GPS	15%
Kalisindh TPS	2%	Shravanti GPS	-13%
Chhabra TPS	No generation	Ramganga HEP	Suspect SCADA data
Chhabra stg-2 TPS	17%	Chibra HEP	0%
Kawai TPS	73%	Khodri HEP	No generation
Dholpur GPS	No generation	Chilla HEP	-9%
Mahi-1 HEP	-7%	HP	
Mahi-2 HEP	No generation	Baspa HEP	-8%
RPS HEP	No generation	Malana HEP	No generation
JS HEP	3%	Sainj HEP	No generation
DELHI		Larji HEP	-3%
Badarpur TPS	Suspect SCADA data	Bhabha HEP	-3%
Bawana GPS	-26%	Giri HEP	1%
Pragati GPS	-3%	J&K	
		Baglihar-1&2 HEP	-16%
		Lower Jhelum HEP	No generation

In line with the decisions taken during various OCC meetings, the time and date of the FRC events were e-mailed to respective utilities. Constituents may submit the FRC of their control areas for both the events and reason of poor response, if observed.

Annexure-A.I**Anticipated Power Supply Position in Northern Region for April 2020**

State / UT		Apr-20 (MU)	Apr-20 (MW)
Chandigarh	Availability	100	300
	Requirement	120	260
	Surplus/Shortfall (MU)	-20	40
	Surplus/Shortfall (%)	-16.7%	15.4%
Delhi	Availability	3190	6230
	Requirement	2800	5880
	Surplus/Shortfall (MU)	390	350
	Surplus/Shortfall (%)	13.9%	6.0%
Haryana	Availability	4530	9790
	Requirement	3970	8540
	Surplus/Shortfall (MU)	560	1250
	Surplus/Shortfall (%)	14.1%	14.6%
Himachal Pradesh	Availability	1150	3850
	Requirement	810	1380
	Surplus/Shortfall (MU)	340	2470
	Surplus/Shortfall (%)	42.0%	179.0%
Jammu & Kashmir	Availability	1350	3300
	Requirement	1670	3010
	Surplus/Shortfall (MU)	-320	290
	Surplus/Shortfall (%)	-19.2%	9.6%
Punjab	Availability	5200	11090
	Requirement	3810	7300
	Surplus/Shortfall (MU)	1390	3790
	Surplus/Shortfall (%)	36.5%	51.9%
Rajasthan	Availability	8480	20640
	Requirement	6630	11170
	Surplus/Shortfall (MU)	1850	9470
	Surplus/Shortfall (%)	27.9%	84.8%
Uttar Pradesh	Availability	10910	21640
	Requirement	10710	21000
	Surplus/Shortfall (MU)	200	640
	Surplus/Shortfall (%)	1.9%	3.0%
Uttarakhand	Availability	950	2750
	Requirement	1160	2000
	Surplus/Shortfall (MU)	-210	750
	Surplus/Shortfall (%)	-18.1%	37.5%
Total NR	Availability	35860	73297
	Requirement	31680	55800
	Surplus/Shortfall (MU)	4180	17497
	Surplus/Shortfall (%)	13.2%	31.4%

Follow up issues from previous OCC meetings

Sl. No.	Agenda point	Details	Status / Decision
1.	Sub-stations likely to be commissioned in next six months.	All the concerned states were requested to submit the details of the downstream network associated specially with POWERGRID substations along with the action plan of their proposed / approved networks.	Present members confirmed the status details of downstream networks mentioned in Annexure-A.II.I.
2.	Progress of installing new capacitors and repair of defective capacitors	Information regarding installation of new capacitors and repair of defective capacitors is to be submitted to NRPC Secretariat.	Information received from Uttarakhand up to February 2020. Rajasthan and Uttar Pradesh up to January 2020. Haryana up to November 2019 Delhi, HP and Chandigarh (up to Sep'2019). All states were requested to furnish updated status monthly.
3.	Healthiness of defence mechanism: Self- certification	Report of mock exercise for healthiness of UFRs carried out by utilities themselves on quarterly basis is to be submitted to NRPC Secretariat and NRLDC. All utilities were advised to certify specifically, in the report that " <i>All the UFRs are checked and found functional</i> ".	Report for the period ending Dec'2019 received from Rajasthan, UP and Punjab . BBMB have submitted information up to Nov'2019 . Delhi, Haryana and HP have submitted information up to Sep'2019 . All states are again requested to submit details of feeder-wise expected load relief through UFR and df/dt relays in the format enclosed at Annexure-A.2.3 of agenda of 165 th OCC.
4.	Status of FGD installation vis-à-vis installation plan at identified TPS	List of FGDs to be installed in NR was finalized in the 36 th TCC (special) meeting dt. 14.09.2017. All SLDCs were regularly requested since 144 th OCC meeting to take up with the concerned generators where FGD was required to be installed. Further, progress of FGD	Updated status in the month of February 2020 has been received from Rajasthan, Punjab and UP . All states/utilities are requested to update status on monthly basis.

Sl. No.	Agenda point	Details	Status / Decision
		installation work on monthly basis is monitored in OCC meetings.	

5. Reactive compensation at 220 kV/ 400 kV level

Sl. No.	Owner	Substation	Reactor	Updated Status
1.	POWERGRID	Kurukshetra	500 MVAR TCR	Anticipated commissioning: Jan-Mar'2021
2	DTL	Peeragarhi	1x50 MVAR at 220 kV	Likely tender opening date: 20.02.2020
		Harsh Vihar	2x50 MVAR at 220 kV	
		Mundka	1x125 MVAR at 400 kV	Likely tender opening date: 04.03.2020
			1x25 MVAR at 220 kV	
		Electric Lane	1x50 MVAR at 220 kV	BOD approval pending
		Bamnauli	2x25 MVAR at 220 kV	Likely tender opening date: 04.03.2020
Indraprastha	2x25 MVAR at 220 kV			
3.	Punjab	Dhuri	1x125 MVAR at 400 kV	Corrigendum to the NIT has been placed and the same is likely to open on 05.03.2020
			1x25 MVAR at 220 kV	
		Nakodar	1x25 MVAR at 220 kV	
4.	PTCUL	Kashipur	1x125 MVAR at 400 kV	PTCUL advised to submit the proposal for PSDF funding.
5.	Rajasthan	Akal	1x25 MVAR	PSDF funding sanctioned. Under tendering
		Bikaner	1x25 MVAR	
		Suratgarh	1x25 MVAR	
		Barmer	1x25 MVAR	Response awaited from TESG of PSDF.
		Jodhpur	1x125 MVAR	

Annexure-All.I

Sl. No.	Substation	Downstream network bays	Commissioning status of S/s / Transformer	Planned 220 kV system and Implementation Status
1	400/220kV, 3x315 MVA Samba	2 nos. bays utilized under ISTS. Balance 4 nos. to be utilized	Commissioned (1 st & 2 nd – Mar'13 3 rd – Oct'16) Bays - Mar'13	<ul style="list-style-type: none"> • LILO of 220 kV Bishnha –Hiranagar D/c line. <p>Target completion - Nov, 2019</p> <ul style="list-style-type: none"> • 220 kV D/c Samba (PG) – Samba (JKPDD) approved in 1st NRSCT. <p>No representation from JKPDD</p>
2	400/220kV, 2x315 MVA New Wanpoh	6 Nos. of 220 kV bays to be utilized	Commissioned in Jul'14 Bays-Jul'14	<ul style="list-style-type: none"> • 220 kV New Wanpoh -Mirbazar D/c line. • 220 kV Alusteng - New Wanpoh Line. <p>No representation from JKPDD</p>
3	400/220kV, 2x500 MVA Kurukshetra (GIS)	4 nos. of 220 kV bays to be utilized 4 nos. of bays utilised for LILO of one circuit of Kaul-Pehowa 220 kV D/c line at Bhadson (Kurukshetra). Commissioned on 07.03.2019 LILO of one circuit of Kaul- Bastara 220 kV D/c line Bhadson(Kurukshetra). Commissioned on 27.06.2019	Commissioned in Mar'17.	<ul style="list-style-type: none"> • 220kV D/c Bhadson (Kurukshetra) – Salempur with HTLS conductor equivalent to twin moose. <p>P.O. issued on 15.10.18. Contract agreement signed on 30.11.18. Likely date of completion is 30.04.2020.</p>
4	400/220 kV, 2x315 MVA Dehradun	Out of 6 bays, only two bays used. Balance 4 bays to be utilised.	Commissioned in Jan'17	<ul style="list-style-type: none"> • 220 kV Dehradun- Jhajra line. <p>Target completion: Nov 2021</p>

Annexure-All.I

Sl. No.	Substation	Downstream network bays	Commissioning status of S/s / Transformer	Planned 220 kV system and Implementation Status
5	Shahjahanpu, 2x315 MVA 400/220 kV	Partially utilized. Balance 4 Nos. of 220 kV bays to be utilized.	Commissioned in Jun/Sep'14	<ul style="list-style-type: none"> • Shajahnapur-Azimpur D/C line is planned, expected by Dec, 2020 • 220 kV D/C Shajahnapur-Gola line expected by Dec, 2020
6	Hamirpur 400/220 kV 2x 315 MVA Sub-station (Augmentation by 3x105 MVA ICT)	2 nos. bays utilized under ISTS. Balance 6 nos to be utilized	1 st -Dec'13, 2 nd – Mar'14 & 3 rd Mar'19. 4 bays-Dec'13, 2 bays-Mar'14 2 bays-Mar'19	<ul style="list-style-type: none"> • 220 kV D/C Hamirpur-Dehan line. Target completion – Dec, 2020
7	Kaithal 400/220 kV 1x 315 MVA Sub-station	July 2017 (Shifting of transformer from Ballabgarh)	Commissioned	<ul style="list-style-type: none"> • 220 kV Kaithal(PG)-Neemwala D/c line. Target completion - 30.04.2020
8	Sikar 400/220kV, 1x 315 MVA S/s	2 Nos. of 220 kV bays	Commissioned	Retendering to be done in Feb/Mar 2020 .
9	Bhiwani 400/220kV S/s	6 nos. of 220kV bays	Commissioned	<ul style="list-style-type: none"> • 220kV Bhiwani (PG) - Isherwal (HVPNL) D/c line. Target completion – Nov, 2020
10	Jind 400/220kV S/s	6 nos. of 220kV bays	Commissioned	<ul style="list-style-type: none"> • LILO of both circuits of 220kV D/c Narwana – Mund line at Jind (PG). Target completion – Nov, 2020

Annexure-All.I

Sl. No.	Substation	Downstream network bays	Commissioning status of S/s / Transformer	Planned 220 kV system and Implementation Status
11	400/220kV Tughlakabad GIS (10 no of 220kV bays)	4x 500	Commissioned	<ul style="list-style-type: none">• RK Puram – Tughlakabad (UG Cable) 220kv D/c line. Scheme will be revised Target completion – March 2023• Okhla – Tughlakabad 220kv D/c line.• Mehrauli – Tughlakabad 220kv D/c line.• BTPS – Tughlakabad 220kv D/c line. Commissioned.• Masjid Mor – Tughlakabad 220kv D/c line. Target completion – Dec, 2021.
12	400/220kV Kala Amb GIS (TBCB) (6 nos. of 220kV bays)	7x105	Commissioned (Jul'17)	HPPTCL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Kala Amb S/s. Details for remaining 4 nos. of line bays may be provided. Target completion – Dec, 2021

Ref: NRLDC/SO-1/117/

Date: 12.03.2020

To,
CGM, (O&M), NRTS-I,
Street Number 5, SCO-84-85,
Sector-16A, Beside Metro Hospital,
Faridabad - 1210022

Subject: Switching operation without NRLDC code.

Sir,

It has been observed that 765kV, 330 MVAR Line Reactor of Bikaner-Moga ckt-2 was opened without NRLDC Code at 07/03/2020, 09:02 hrs.

It is a gross violation of IEGC grid clause no 5.2(c) as quoted below-

"No important element of the National/Regional grid shall be deliberately opened or removed from service at any time, except when specifically instructed by RLDC or with specific and prior clearance of RLDC. The list of such important grid elements on which the above stipulations apply shall be prepared by the RLDC in consultation with the concerned Users, CTU and STUs, and be available at the websites of NLDC/RLDC/SLDCs. In case of opening/removal of any important element of the grid under an emergency situation, the same shall be communicated to RLDC at the earliest possible time after the event. RLDC shall inform the opening/removal of the important elements of the regional grid, to NLDC, and to the concerned Regional Entities (whose grid would be affected by it) as specified in the detailed operating procedure by NLDC".

It is requested to advise the concerned to avoid such practices in the interest of safe, reliable and integrated grid operation.

Thanking You,

Yours faithfully



MM Hasan

GM(SO-1), NRLDC

Copy for kind information:

1. Member Secretary, NRPC, New Delhi
2. Executive Director, NRTS-1
3. Executive Director, NRLDC
4. CGM, NRLDC



Ref: NRLDC/SO-1/117/

Date: 12.03.2020

To,
DGM (SO),
SLDC, Delhi Transco Limited,
33kV Sub Station Building,
Minto Road, New Delhi- 110002

Subject: Switching operation without NRLDC code.

Sir,

It has been observed that 400kV Bawana-Mundka ckt-1 and 400kv CCGTB-Bawana ckt-2 tripped and which were taken into service without NRLDC code. Details of such tripping are mentioned as below-

1. 400kV Bawana-Mundka ckt-1 (tripped at 09/03/2020, 01:46 hrs. and charged at 09/03/2020,06:55 hrs.)
2. 400kV CCGTB-Bawana ckt-2 (tripped at 11/02/2020, 14:48 hrs. and at 11/02/2020 17:55 hrs.)

It is a gross violation of IEGC grid clause no 5.2 (d) as quoted below-

"Any tripping, weather manual or automatic, of any of the above element of Regional grid shall be precisely intimated by the concerned SLDC/CTU/user to RLDC as soon as possible, say within 10 minutes of event. The reason (to the extent determine) and the likely time of restoration shall also be intimated. All reasonable attempts shall be made for the elements' restoration as soon as possible. RLDC shall inform the tripping of important elements of the grid, to NLDC, and to the concerned Regional Entities (whose grid would be effected by it) as specified in the details operating procedure by NLDC."

It is requested to advise the concerned to avoid practices in the interest of safe, reliable and integrated grid operation.

Thanking You,

Yours faithfully

MM Hasan

GM(SO-1), NRLDC

Copy for kind information:

1. Member Secretary, NRPC, New Delhi
2. Executive Director, Delhi SLDC
3. Executive Director, NRLDC
4. CGM, NRLDC

Ref: NRLDC/SO-1/117/

Date: 12.03.2020

To,
CGM, (O&M), NRTS-III
Power Grid Corporation of India Limited,
2nd, 3rd & 4th Floor, U.P. Co-operative Sugar Federation Building,
12, Rana Pratap Marg, Lucknow, U.P.- 226001

Subject: Switching operation without NRLDC code.

Sir,

It has been observed that 765kV Aligarh-Orai ckt-1, 400kV Bareilly-Shahjahanpur ckt 1 tripped and which were taken into service without NRLDC code. Details of such tripping are mentioned as below-

1. 765kV Aligarh-Orai ckt-1 (tripped at 29/02/2020, 22:12 hrs and charged at 29/02/2020, 22:23 hrs).
2. 400kV Bareilly-Shahjahanpur ckt-1 (tripped at 09/03/2020, 11:32 hrs and charged at 09/03/2020 12:05 hrs).

It is a gross violation of IEGC grid clause no 5.2 (d) as quoted below-

"Any tripping, weather manual or automatic, of any of the above element of Regional grid shall be precisely intimated by the concerned SLDC/CTU/user to RLDC as soon as possible, say within 10 minutes of event. The reason (to the extent determine) and the likely time of restoration shall also be intimated. All reasonable attempts shall be made for the elements' restoration as soon as possible. RLDC shall inform the tripping of important elements of the grid, to NLDC, and to the concerned Regional Entities (whose grid would be effected by it) as specified in the details operating procedure by NLDC".

It is requested to advise the concerned to avoid such practices in the interest of safe, reliable and integrated grid operation.

Thanking You,

Yours faithfully

MM Hasan

GM(SO-1), NRLDC

Copy for kind information:

1. Member Secretary, NRPC, New Delhi
2. Executive Director, NRTS-III
3. Executive Director, NRLDC
4. CGM, NRLDC

Gaurav Malviya (गौरव मालवीय)

From: Alok Kumar (आलोक कुमार)
Sent: 09 March 2020 11:35
To: Gaurav Malviya (गौरव मालवीय)
Subject: FW: Charging of 400 kV Bawana - Mundka ckt 1 without NRLDC code

From: NRLDC POSOCO [nrldcso@gmail.com]
Sent: Monday, March 09, 2020 8:20 AM
To: Delhi Scheduling; DTL WEB
Cc: S. S. Barpanda (एस. एस. बरपंडा); H K Chawla (एच के चावला); M M Hassan (एम एम हसन); Alok Kumar (आलोक कुमार)
Subject: Charging of 400 kV Bawana - Mundka ckt 1 without NRLDC code

Sir,

400 kV Bawana - Mundka ckt 1 tripped at 01:57 Hrs .
And the line has restored without prior intimation and without taking operating code from NRLDC by Delhi SLDC.

This is a clear violation of IEGC/Operating procedure of NR.

May like to provide the reason for the same.

Thanks & Regards,

NRLDC SO Dept.

NRLDC, Power System Operation Corporation Ltd.
18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016
Ph. : 011-26519406, 46560411,40224601, 40224602
Orange : 20112012/14/15/ 20112151/52
M.: 08448167373
EPBAX : 116

Gaurav Malviya (गौरव मालवीय)

From: Alok Kumar (आलोक कुमार)
Sent: 09 March 2020 11:36
To: Gaurav Malviya (गौरव मालवीय); Nitin Yadav (नितिन यादव)
Subject: FW: Charging of 220kV Badarpur-Ballabgarh-2 without NRLDC code

From: NRLDC POSOCO [nrldcso@gmail.com]
Sent: Sunday, March 08, 2020 9:38 PM
To: Pcont; DTL WEB; Energy Accounting Cell SLDC Delhi
Cc: M M Hassan (एम एम हसन); S. S. Barpanda (एस. एस. बरपंडा); H K Chawla (एच के चावला); Alok Kumar (आलोक कुमार)
Subject: Charging of 220kV Badarpur-Ballabgarh-2 without NRLDC code

Sir,

220kV Badarpur-Ballabgarh-2 has been charged from both ends without issuance of NRLDC code. This is a clear violation of IEGC/Operating procedure of NR.

May like to provide the reason for the same.

Thanks & Regards,

NRLDC SO Dept.

NRLDC, Power System Operation Corporation Ltd.
18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016
Ph. : 011-26519406, 46560411,40224601, 40224602
Orange : 20112012/14/15/ 20112151/52
M.: 08448167373
EPBAX : 116

Annexure-B.2

S.No	Element Name	Type	Voltage Level	Owner	Outage		Revival		Reason / Remarks
					Date	Time	Date	Time	
1	400 KV Alaknanda GVK(UPC)-Vishnuprayag(JP) (UP) Ckt-1	Line	400KV	UPPTCL	10-03-2020	17.25	10-03-2020	19.23	Over voltage
2	400 KV Aligarh-Mainpuri (UP) Ckt-1	Line	400KV	UPPTCL	29-02-2020	13.00	01-03-2020	20.28	Over voltage Flags:-O/V, 86A & 86B Optd.
	400 KV Aligarh-Mainpuri (UP) Ckt-1	Line	400KV	UPPTCL	03-03-2020	13.00	04-03-2020	11.00	Over voltage O/V,86A & 86B Optd.
	400 KV Aligarh-Mainpuri (UP) Ckt-1	Line	400KV	UPPTCL	04-03-2020	13.26	05-03-2020	7.39	Over voltage 400kv MNP-Aligarh Circuit-1 line tripped due to O/V (442 KV) at 13:26 hrs. flag details Over Voltage 86A,& 86B OPTD.
	400 KV Aligarh-Mainpuri (UP) Ckt-1	Line	400KV	UPPTCL	05-03-2020	13.00	06-03-2020	8.56	Tripped due to O/V (442 KV) at 13:00 hrs. flag details Over Voltage 86A,& 86B OPTD.
	400 KV Aligarh-Mainpuri (UP) Ckt-1	Line	400KV	UPPTCL	08-03-2020	13.00	08-03-2020	20.00	Over voltage Tripped from Mainpuri end.
3	400 KV Bamnoli(DV)-Jhatikara(PG) (DV) Ckt-1	Line	400KV	DTL	05-03-2020	0.42	05-03-2020	5.17	Over voltage over volatege tripping
	400 KV Bamnoli(DV)-Jhatikara(PG) (DV) Ckt-1	Line	400KV	DTL	10-03-2020	4.00	10-03-2020	4.20	Over voltage high voltage tripping 430KV. Tripped only at Bamnoli end.
4	400 KV Bareilly-Unnao (UP) Ckt-1	Line	400KV	UPPTCL	06-03-2020	12.17	06-03-2020	13.34	400kv Bareilly - Unnao Ckt I is tripped at 12:17 hrs. Flags : Over voltage protection, Gr-A, Gr-B trip relay optd.
	400 KV Bareilly-Unnao (UP) Ckt-1	Line	400KV	UPPTCL	07-03-2020	4.45	07-03-2020	6.55	line tripped due to over voltage flag details Over Voltage 86A,& 86B operated.
	400 KV Bareilly-Unnao (UP) Ckt-1	Line	400KV	UPPTCL	08-03-2020	1.30	08-03-2020	2.27	It is to inform you that at 01:30 hrs dated -08/03/2020, 400 KV unnao- Bareilly-1st line final tripped at both end .flag at Unnao end C/P :- CH-1 DTR , CH-2 DTR, Grp -A and Grp-B trip relay operated R/P:- Grp-A and Grp-B 3 phase trip unit operated. Flag are reset now. Please issue the charging code for 400 kv unnao Bareilly line -1 st
	400 KV Bareilly-Unnao (UP) Ckt-1	Line	400KV	UPPTCL	10-03-2020	0.16	10-03-2020	1.05	400kv Bareilly - Unnao Ckt-I is tripped at 00:16 hrs. Flags : Over voltage protection trip, Gr-A, Gr-B trip relay optd.
5	400 KV Bawana-Mundka (DV) Ckt-1	Line	400KV	DTL	05-03-2020	0.41	05-03-2020	7.31	Over voltage over volatege tripping
	400 KV Bawana-Mundka (DV) Ckt-1	Line	400KV	DTL	10-03-2020	3.47	10-03-2020	7.04	Over voltage high voltage tripping 431 KV
6	400 KV Bhiwadi-Hissar (PG) Ckt-2	Line	400KV	POWERGRID	03-03-2020	11.00	03-03-2020	12.42	Over voltage Tripped due to over voltage .
7	400 KV Dadri(NT)-Maharanibagh(PG) (PG) Ckt-1	Line	400KV	POWERGRID	06-03-2020	0.59	06-03-2020	9.53	Over voltage Tripped on Over Voltgae. Voltage-437KV.
	400 KV Dadri(NT)-Maharanibagh(PG) (PG) Ckt-1	Line	400KV	POWERGRID	06-03-2020	23.52	07-03-2020	0.01	Tripped on Over volatge as reported by NR1. As per PMU, voltage was 429 kV before tripping. After tripping, Bus voltage at Maharanibaug was 441kV.

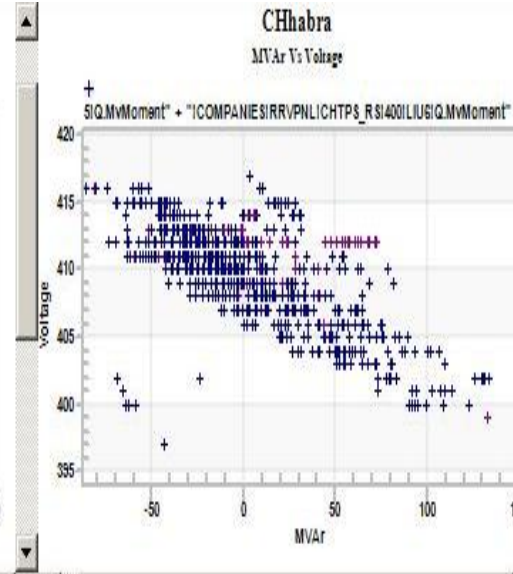
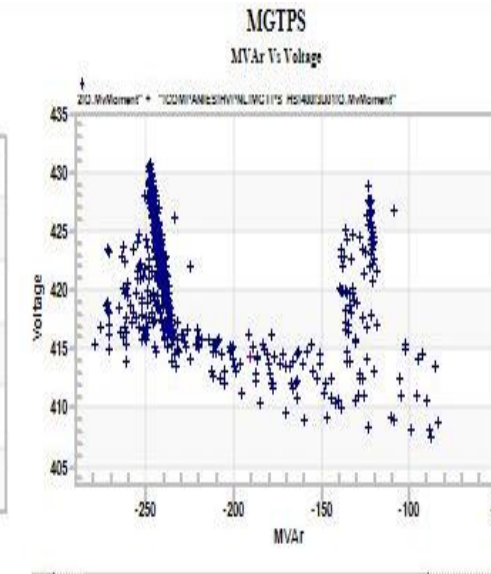
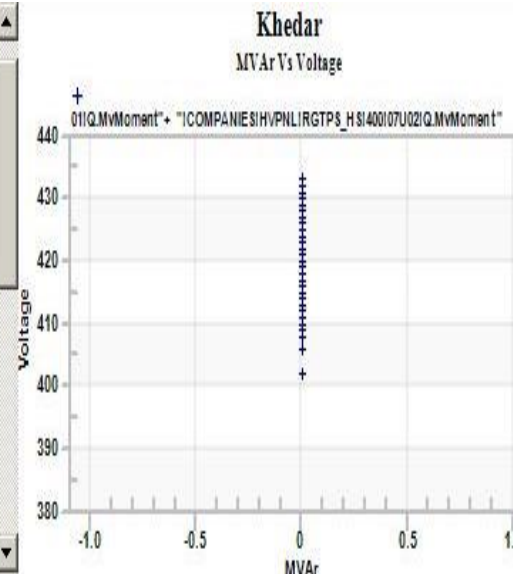
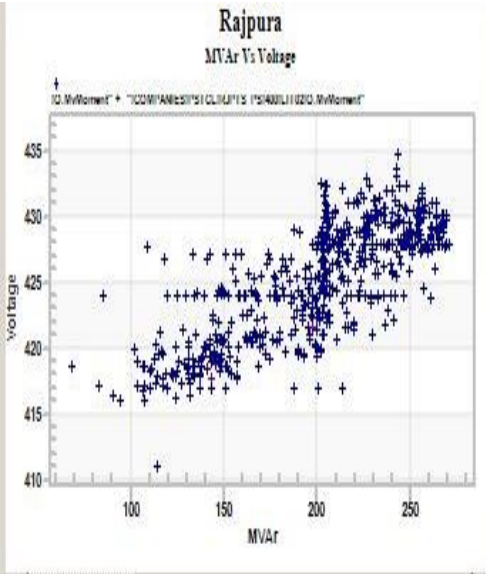
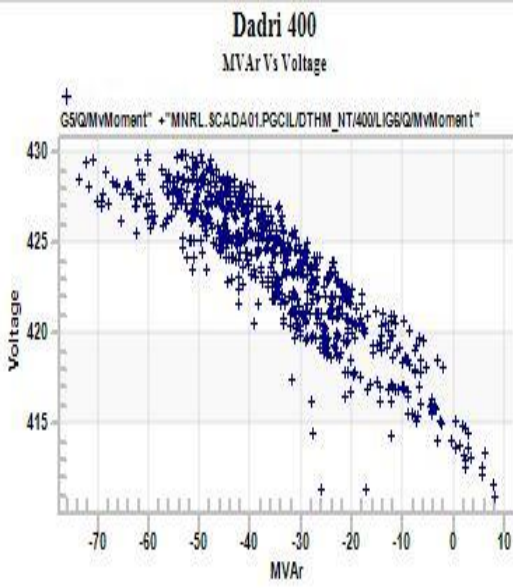
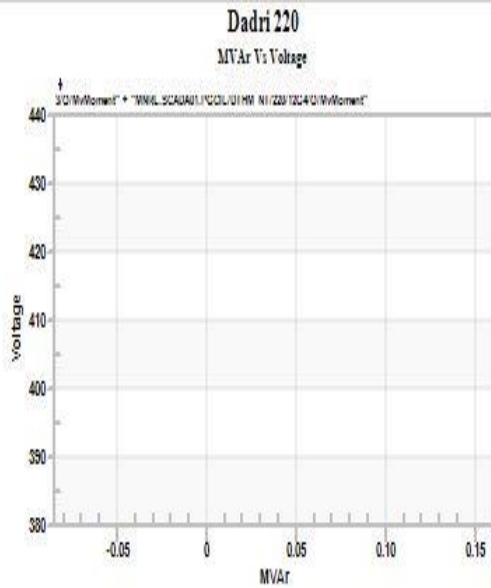
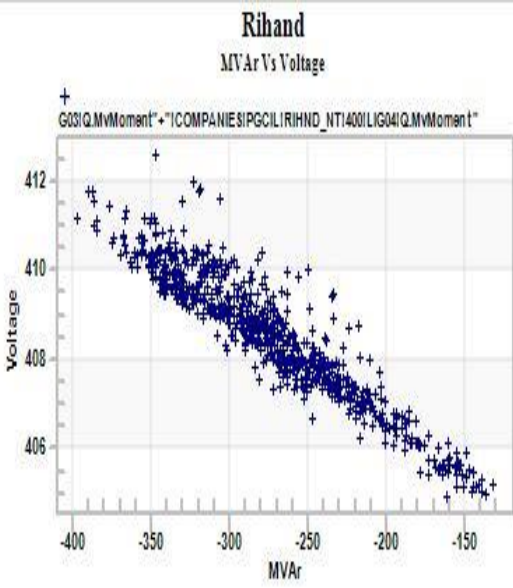
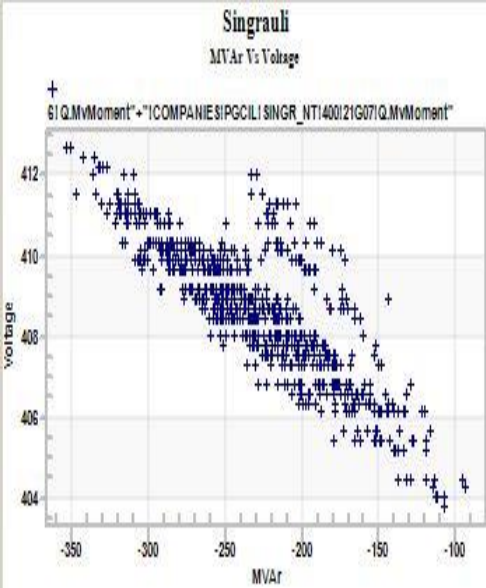
Annexure-B.2

8	400 KV Deepalpur(JHKT)-Bawana(DV) (PG) Ckt-1	Line	400KV	POWERGRID	05-03-2020	0.41	05-03-2020	5.09	Over voltage TRIPPED DUE TO OVER VOLTAGE
	400 KV Deepalpur(JHKT)-Bawana(DV) (PG) Ckt-1	Line	400KV	POWERGRID	09-03-2020	1.45	09-03-2020	2.27	DUE TO OVER VOLTAGE
	400 KV Deepalpur(JHKT)-Bawana(DV) (PG) Ckt-1	Line	400KV	POWERGRID	10-03-2020	1.43	10-03-2020	4.56	Over voltage Tripped.
	400 KV Deepalpur(JHKT)-Bawana(DV) (PG) Ckt-1	Line	400KV	POWERGRID	10-03-2020	16.00	10-03-2020	18.21	Over voltage
9	400 KV Gorakhpur(PG)-Lucknow_1(PG) (PL) Ckt-1	Line	400KV	POWERLINK	01-03-2020	2.23	08-03-2020	7.47	Over voltage over voltage stage-1 protection operated at Lucknow & DT received at Gorakhpur
10	400 KV Heerapura-Hindaun (RS) Ckt-1	Line	400KV	RRVNL	10-03-2020	15.28	11-03-2020	6.28	manually open due to high voltage.
11	400 KV Jind(PG)-Kirori(HV) (HVPNL) Ckt-1	Line	400KV	HVPNL	10-03-2020	3.58	11-03-2020	6.12	Over voltage tripped on Over voltage protection operated at Jind .Jind-432kV
12	400 KV Lucknow_1-Sohawal (PG) Ckt-1	Line	400KV	POWERGRID	01-03-2020	2.23	02-03-2020	8.29	Over voltage over voltage stage-1 protection operated at Lucknow & DT received at Sohawal
13	400 KV Moga-Jalandhar (PG) Ckt-2	Line	400KV	POWERGRID	10-03-2020	3.47	10-03-2020	3.58	Over voltage Line tripped from jalandher end only due on high voltage
14	400 KV Muktsar-Makhu (PS) Ckt-1	Line	400KV	PSTCL	09-03-2020	13.11	09-03-2020	14.34	due to high voltage
15	400 KV Rajpura TPS(PSG)-Nakodar(PSG) (PS) Ckt-2	Line	400KV	PSTCL	10-03-2020	11.38	10-03-2020	13.30	Over voltage
	400 KV Rajpura TPS(PSG)-Nakodar(PSG) (PS) Ckt-2	Line	400KV	PSTCL	11-03-2020	12.59	11-03-2020	13.36	Over fluxing OVER FLUX
16	400 KV Rajpura TPS(PSG)-Rajpura(PS) (PS) Ckt-1	Line	400KV	PSTCL	10-03-2020	11.38	10-03-2020	20.12	Over voltage
	400 KV Rajpura TPS(PSG)-Rajpura(PS) (PS) Ckt-1	Line	400KV	PSTCL	11-03-2020	13.01	*	*	Over fluxing OVER FLUX
17	400 KV Rajpura TPS(PSG)-Rajpura(PS) (PS) Ckt-2	Line	400KV	PSTCL	10-03-2020	10.24	*	*	Over voltage
18	400 KV Rajpura-Dhuri (PS) Ckt-2	Line	400KV	PSTCL	10-03-2020	12.42	11-03-2020	8.12	High voltage
19	400 KV Talwandi Saboo(PSG)-Muktsar(PS) (PS) Ckt-1	Line	400KV	PSTCL	09-03-2020	13.08	*	*	dueto high voltage
20	400/220 kV 315 MVA ICT 1 at Makhu(PS)	ICT	400/220KV	PSTCL	09-03-2020	2.01	09-03-2020	11.50	Over fluxing
	400/220 kV 315 MVA ICT 1 at Makhu(PS)	ICT	400/220KV	PSTCL	10-03-2020	2.07	10-03-2020	9.30	Over fluxing over flux

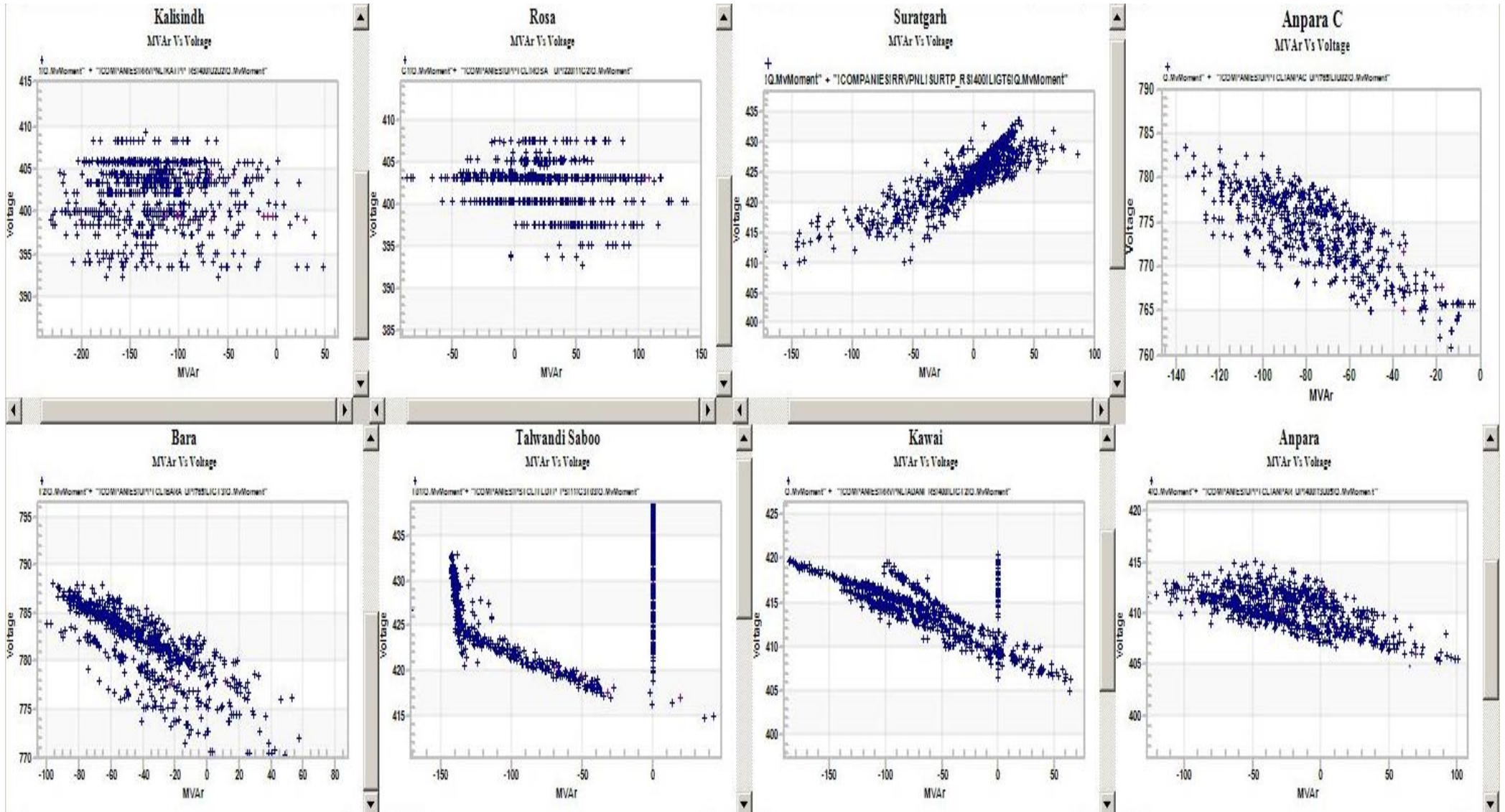
Annexure-B.2

	400/220 kV 315 MVA ICT 1 at Makhu(PS)	ICT	400/220KV	PSTCL	10-03-2020	15.55	11-03-2020	6.58	OVER FLUX TRIP
21	400/220 kV 315 MVA ICT 2 at Makhu(PS)	ICT	400/220KV	PSTCL	10-03-2020	2.34	10-03-2020	18.59	Over fluxing over flux
22	400/220 kV 315 MVA ICT 4 at Daulatabad(HV)	ICT	400/220KV	HVNL	01-03-2020	3.16	01-03-2020	8.03	Over fluxing TRANSFORMER TRIPPED DUE TO OVERFLUXING RELAY
	400/220 kV 315 MVA ICT 4 at Daulatabad(HV)	ICT	400/220KV	HVNL	01-03-2020	23.42	02-03-2020	5.55	Over fluxing tripped at 23.42 hrs dated 01.03.2020
23	400/220 kV 500 MVA ICT 1 at Dhuri(PS)	ICT	400/220KV	PSTCL	09-03-2020	2.06	09-03-2020	12.25	Over fluxing
	400/220 kV 500 MVA ICT 1 at Dhuri(PS)	ICT	400/220KV	PSTCL	09-03-2020	21.54	*	*	over flux
24	400/220 kV 500 MVA ICT 3 at Dhuri(PS)	ICT	400/220KV	PSTCL	07-03-2020	3.36	07-03-2020	6.48	Over fluxing
	400/220 kV 500 MVA ICT 3 at Dhuri(PS)	ICT	400/220KV	PSTCL	08-03-2020	3.15	08-03-2020	7.43	Over fluxing
	400/220 kV 500 MVA ICT 3 at Dhuri(PS)	ICT	400/220KV	PSTCL	09-03-2020	1.00	09-03-2020	7.32	Over fluxing
	400/220 kV 500 MVA ICT 3 at Dhuri(PS)	ICT	400/220KV	PSTCL	10-03-2020	0.00	11-03-2020	10.31	Over fluxing over flux
25	400/220 kV 500 MVA ICT 3 at Rajpura(PS)	ICT	400/220KV	PSTCL	09-03-2020	2.00	09-03-2020	6.29	Over fluxing
	400/220 kV 500 MVA ICT 3 at Rajpura(PS)	ICT	400/220KV	PSTCL	10-03-2020	2.23	10-03-2020	7.42	Over fluxing over flux
	400/220 kV 500 MVA ICT 3 at Rajpura(PS)	ICT	400/220KV	PSTCL	10-03-2020	11.21	11-03-2020	7.13	Over voltage

Annexure-B.3



Annexure-B.3



Annexure-B.4

Sl. No.	Element Name	Outage Date	Outage Time	Reason/Remarks
1	400 KV Bawana(DV)-Mundka (DV) Ckt-1	01-Feb-20	0.01	Over voltage. As per PMU, No fault observed.
		02-Feb-20	1.59	Over voltage. As per PMU, No fault observed.
		03-Feb-20	1.49	Over voltage. As per PMU, No fault observed.
		07-Feb-20	1.59	Over voltage. As per PMU, No fault observed.
		19-Feb-20	2.30	Over voltage. As per PMU, No fault observed.
		21-Feb-20	1.32	Over voltage. As per PMU, No fault observed.
		22-Feb-20	21.39	Over voltage. As per PMU, No fault observed.
2	220 KV RAPS_A(NP)-Sakatpura(RS) (RS) Ckt-2	01-Feb-20	2.48	As per PMU, R-N fault occurred, no auto-reclosing observed.
		01-Feb-20	4.38	R-N fault, 34.3Km from RAPP(A) end. As per PMU, R-N fault occurred, no auto-reclosing observed.
		02-Feb-20	20.55	R-N fault, 31.7Km from RAPP(A) end. As per PMU, R-N fault occurred, no auto-reclosing observed.
		05-Feb-20	23.40	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
		06-Feb-20	1.56	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
		20-Feb-20	5.08	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
		26-Feb-20	5.23	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
3	400 KV Aligarh(UP)-Sikandrabad (UP) Ckt-2	10-Feb-20	12.20	B-N fault. As per PMU, B-N fault occurred, no auto-reclosing observed.
		19-Feb-20	3.37	B-N fault. As per PMU, B-N fault occurred, no auto-reclosing observed.
		19-Feb-20	11.49	B-N fault. As per PMU, B-N fault occurred, no auto-reclosing observed.
		21-Feb-20	2.01	B-N fault. As per PMU, B-N fault occurred, no auto-reclosing observed.
4	400 KV Bareilly(UP)-Unnao (UP) Ckt-1	15-Feb-20	1.30	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
		21-Feb-20	0.00	Over voltage. As per PMU, No fault observed.
		21-Feb-20	13.21	Over voltage. As per PMU, No fault observed.
		21-Feb-20	16.46	R-B fault. As per PMU, R-B fault is observed.
5	400 KV Suratgarh(RVUN)-Ratangarh(RS) (RS) Ckt-2	02-Feb-20	14.29	B-N fault. As per PMU, No fault observed.
		08-Feb-20	19.50	Y-N fault, 2.8Km from Ratangarh end. As per PMU, R-N fault occurred, no auto-reclosing observed.
		10-Feb-20	12.03	B-N fault, 96.7Km from Ratangarh end. As per PMU, Y-N fault occurred, no auto-reclosing observed.
		24-Feb-20	16.29	B-N fault, 91.4Km from Ratangarh end. As per PMU, Y-N fault occurred, no auto-reclosing observed.
6	400 KV Aligarh(UP)-Mainpuri (UP) Ckt-1	19-Feb-20	1.27	Over voltage. As per PMU, No fault observed.
		23-Feb-20	16.30	Over voltage. As per PMU, No fault observed.
		29-Feb-20	13.00	Over voltage. As per PMU, No fault observed.
7	400 KV Aligarh(UP)-Sikandrabad (UP) Ckt-1	14-Feb-20	11.47	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
		16-Feb-20	12.46	R-N fault. As per PMU, R-N fault occurred, no auto-reclosing observed.
		19-Feb-20	3.44	B-N fault, auto reclosure successful only from aligarh end. As per PMU, R-N fault occurred, successful autorecloing is observed.
8	400 KV Bareilly(UP)-Unnao (UP) Ckt-2	01-Feb-20	20.56	B-N fault. As per PMU, B-N fault occurred, successful autorecloing is observed.
		12-Feb-20	14.16	Y-B fault. As per PMU, Y-B fault is observed.
		13-Feb-20	12.15	R-B fault. As per PMU, R-B fault is observed.

Annexure-B.5

Sl. No.	Name of Elements (Tripped/Manually opened)	Owner/ Agency	Outage		Event (As reported)	Generation Loss(MW)	Load Loss (MW)	Category as per CEA Grid Standards	Energy Unreserved (in MU)	Preliminary Report receipt status			DR/EL receipt status			Detailed Report receipt		Fault Clearance time (in ms)
			Date	Time						within 24hrs	after 24hrs	Not Received	within 24hrs	after 24hrs	Not Received	Received	Not Received	
1	1) 400 KV CLP Jhajjar(CLP)-Dhanoda(HV) (HVPNL) Ckt-1 2) 660 MW Jhajjar(CLP) - UNIT 1	HVPNL	1-Feb-20	7.04	400 KV CLP Jhajjar(CLP)-Dhanoda(HV) (HVPNL) Ckt-1 tripped on B-N fault. At the same time, 660 MW Jhajjar(CLP) - UNIT 1 also tripped. As per PMU, B-N fault is observed in the system. In antecedent conditions, 400 KV CLP Jhajjar(CLP)-Dhanoda(HV) (HVPNL) Ckt-1 carrying 324MW and 660 MW Jhajjar(CLP) - UNIT 1 generating 375MW.	375	0	GD-1	0			Y(Har)			Y(Har)		Y(Har)	80ms
2	1) 400 KV Anpara-Sarnath (UP) Ckt-1 2) 400/220 kv 315 MVA ICT 1 at Sarnath(UP)	UPPTCL	2-Feb-20	10.47	400 KV Anpara-Sarnath (UP) Ckt-1 tripped on R-B fault. At the same time, 315 MVA ICT 1 at 400/220kv Sarnath(UP) also tripped. As per PMU, R-B fault is observed in the system. In antecedent conditions, 400 KV Anpara-Sarnath (UP) Ckt-1 & 315 MVA ICT 1 at 400/220kv Sarnath(UP) carrying 475MW & 170MW respectively.	0	0	GI-2	0		Y(UP)			Y(UP)		Y(UP)		80ms
3	1) 132 KV Sewa_2(NH)-Kathua(PDD) (PG) Ckt-1 2) 132 KV Kathua(JK)-Mahanpur(JK) (PG) Ckt-1	J&K, NHPC & POWERGRID	3-Feb-20	20.42	132 KV Sewa_2(NH)-Kathua(PDD) (PG) Ckt-1 & 132 KV Kathua(JK)-Mahanpur(JK) (PG) Ckt-1 tripped on R-N fault on zone-3 protection. As per PMU, R-N fault with delayed clearance of 1760ms is observed in the system. In antecedent conditions, 132 KV Sewa_2(NH)-Kathua(PDD) (PG) Ckt-1 carrying 37MW.	0	100	GD-1	0.09	Y(PG)	Y(NHPC)	Y(JK)		Y(NHPC)	Y(JK), Y(PG)		Y(JK)	1760ms
4	1) 400 KV Bawana CCGTB(DTL)-Bahadurgarh(PG) (PG) Ckt-1 2) 400KV Bus 2 at Bawana CCGTB(DTL) 3) STG-1 at Bawana CCGTB(DTL)	DTL & POWERGRID	11-Feb-20	14.48	Y phase CT of Tie CB 405 got blasted and 400kv Bus 2 at Bawana CCGTB(DTL) tripped due to operation of Bus Bar protection. 400 KV Bawana CCGTB(DTL)-Bahadurgarh(PG) (PG) Ckt-1 tripped due to tripping of Main CB (Tie CB already under shutdown) and STG-1 of 400KV Bawana CCGTB(DTL) also tripped. As per PMU, Y-N fault with delayed clearance is observed in the system. In antecedent conditions, 400 KV Bawana CCGTB(DTL)-Bahadurgarh(PG) (PG) carrying 158MW & STG-1 of 400KV Bawana CCGTB(DTL) generating 193MW.	190	0	GD-1	0	Y(DTL), Y(PG)			Y(PG)	Y(DTL)		Y(DTL)		200ms
5	1) 125 MVAR Bus Reactor No 1 at 400KV Koteswar(TH) 2) 400 KV Koteswar(TH)-Koteswar(PG) (PG) Ckt-2 3) 100 MW Koteswar HPS - UNIT 2 4) 100 MW Koteswar HPS - UNIT 4	POWERGRID, THDC	20-Feb-20	6.09	Bus bar 2 protection operated at Koteswar hydro during synchronization of Unit 4 at Koteswar. Unit 2-100 MW, 125 MVAR Bus-Reactor & 400 KV Koteswar(TH)-Koteswar(PG) (PG) Ckt-2 also tripped. As per PMU, No fault is observed in the system. In antecedent conditions, Unit#2 generating 90MW and 400 KV Koteswar(TH)-Koteswar(PG) (PG) Ckt-2 carrying 135MW.	90	0	GD-1	0	Y(PG)		Y(THDC)		Y(PG)	Y(THDC)		Y(THDC)	NA
6	1) 400 KV Rewa Road-Panki (UP) Ckt-1 2) 400 KV Panki-Aligarh (UP) Ckt-1	UPPTCL	20-Feb-20	23.35	400 KV Panki-Aligarh (UP) tripped from Panki end. At the same time, 400 KV Rewa Road-Panki (UP) also tripped on overvoltage. As per PMU, Y-N fault is observed in the system. In antecedent conditions, 400 KV Panki-Aligarh (UP) & 400 KV Rewa Road-Panki (UP) carrying 65MW & 135MW respectively.	0	0	GI-2	0	Y(UP)				Y(UP)		Y(UP)		80ms
7	1) 400 KV Gorakhpur(PG)-Motihari(BS) (PG) Ckt-1 2) 400 KV Gorakhpur(PG)-Motihari(BS) (PG) Ckt-2	POWERGRID	24-Feb-20	0.52	400 KV Gorakhpur(PG)-Motihari(BS) (PG) Ckt-1&2 due to Y-N fault. As per PMU, multiple Y-N faults are observed in the system. In antecedent conditions, 400 KV Gorakhpur(PG)-Motihari(BS) (PG) Ckt-1&2 carrying 175MW & 186MW respectively.	0	0	GI-2	0			Y(PG)			Y(PG)		Y(PG)	80ms
8	1) 400 KV Allahabad(PG)-Meja TPS(MUN) (PG) Ckt-2 2) 400 KV Meja TPS(MUN)-Masoli(UP) (UP) Ckt-1	POWERGRID, UPPTCL	24-Feb-20	16.33	400 KV Meja TPS(MUN)-Masoli(UP) (UP) Ckt-1 tripped because of DT recieved at MEJA end. 400 KV Allahabad(PG)-Meja TPS(MUN) (PG) Ckt-2 also tripped. As per PMU, No fault observed in the system. In antecedent conditions, 400 KV Meja TPS(MUN)-Masoli(UP) (UP) Ckt-1 carrying 152MW.	0	0	GI-2	0		Y(UP)			Y(UP)		Y(UP)		NA
9	1) 500 kv HVDC Rihand-Dadri (PG) Ckt-1 2) 400 KV Rihand(NT)-Allahabad(PG) (PG) Ckt-2	POWERGRID	25-Feb-20	14.05	400 KV Rihand(NT)-Allahabad(PG)(PG) Ckt-2 tripped due to R-N fault. At the same time 500 kv HVDC Rihand-Dadri (PG) Ckt-1 also tripped due to operation of short circuit protection at Rihand end. As per PMU, R-N fault is observed in the system. In antecedent conditions, 400 KV Rihand(NT)-Allahabad(PG)(PG) Ckt-2 carrying 288MW.	0	0	GI-2	0	Y(NTPC)	Y(PG)		Y(NTPC)	Y(PG)		Y(PG)		120ms
10	1) 400/220 kv 315 MVA ICT 4 at Daulatabad(HV) 2) 400/220 kv 315 MVA ICT 1 at Daulatabad(HV) 3) 400/220 kv 315 MVA ICT 2 at Daulatabad(HV) 4) 400KV Bus 1 at Daulatabad(HV) 5) 400KV Bus 2 at Daulatabad(HV) 6) 400 KV Dhanoda-Daulatabad (HV) Ckt-2 7) 400 KV Gurgaon(PG)-Daulatabad(HV) (HV) Ckt-1 8) 400 KV Dhanoda-Daulatabad (HV) Ckt-1 9) 400 KV Gurgaon(PG)-Daulatabad(HV) (HV) Ckt-2	HVPNL	26-Feb-20	13.26	400 kv Daulatabad(HV) - Jhajjar (APCL) ckt 1 got tripped due to B-N fault. Consequently, 400 kv Daulatabad(HV) - Jhajjar (APCL) ckt 2 and other elements connected to 400 kv Daulatabad(HV) also got tripped. As per PMU, B-N fault with delayed clearance is observed in the system. In antecedent conditions, 315 MVA ICT 1, 315 MVA ICT 2, 315 MVA ICT 3 & 315 MVA ICT 4 at Daulatabad(HV) carrying 97MW, 88MW, 95MW & 94MW respectively.	0	400	GD-1	0.586	Y(PG)		Y(Har)		Y(PG)	Y(Har)		Y(Har)	2360ms
11	1) 400/220 kv 315 MVA ICT 1 at Amargarh(NRSS XXIX) 2) 400/220 kv 315 MVA ICT 2 at Amargarh(NRSS XXIX)	NRSS29 & J&K	29-Feb-20	11.29	400/220 kv 315 MVA ICT 1 & 315 MVA ICT 2 at Amargarh(NRSS XXIX) tripped due to s-4 over current operated of Amargarh Ziankot line. As per PMU, R-N fault is observed in the system In antecedent conditions, 400/220 kv 315 MVA ICT 1 & 315 MVA ICT 2 at Amargarh(NRSS XXIX) carrying 177MW each.	0	280	GD-1	0.91			Y(NRSS29), Y(JK)		Y(NRSS29), Y(JK)		Y(NRSS29), Y(JK)		80ms

Northern Regional inter regional lines tripping for Feb-20

Annexure-B.6

Sl. No.	Name of Transmission Element Tripped	Owner/ Utility	Outage		Load Loss/ Gen. Loss	Brief Reason (As reported)	Category as per CEA Grid standards	Restoration		# Fault Clearance Time (>100 ms for 400 kV and 160 ms for 220 kV)	*FIR Furnished (YES/NO)	DR/EL provided in 24 hrs (YES/NO)	Other Protection Issues and Non Compliance (inference from PMU, utility details)	Suggestive Remedial Measures	Remarks
			Date	Time				Date	Time						
1	400 KV Balia(PG)-Patna (PG) Ckt-2	POWERGRID	19-Feb-20	22.09	Nil	DT received at Balia (PG) end.	NA	19-Feb-20	23.28	NA	NO	NO		Details of tripping yet to be received.	From PMU, No fault observed in the system.
2	400 KV Gorakhpur(PG)-Barh(BS) (PG) Ckt-1	POWERGRID	24-Feb-20	0.52	Nil	Y-N fault.	GI-2	24-Feb-20	18.50	Yes	NO	NO	Tripping of both the ckt needs to be looked into	Details of tripping yet to be received.	From PMU, multiple Y-N faults are observed in the system.
3	400 KV Gorakhpur(PG)-Barh(BS) (PG) Ckt-2	POWERGRID	24-Feb-20	0.52	Nil	Y-N fault.	GI-2	24-Feb-20	17.35	Yes	NO	NO	Tripping of both the ckt needs to be looked into	Details of tripping yet to be received.	From PMU, multiple Y-N faults are observed in the system.
4	400 KV Gorakhpur(PG)-Barh(BS) (PG) Ckt-1	POWERGRID	26-Feb-20	15.48	Nil	DT received at Gorakhpur (PG)	NA	26-Feb-20	17.46	NA	NO	NO		Details of tripping yet to be received.	From PMU, No fault observed in the system.
5	765 KV Orai(PG)-Jabalpur (PG) Ckt-2	POWERGRID	29-Feb-20	21.50	Nil	B-N fault.	NA	1-Mar-20	0.29	Yes	NO	NO	A/R didn't operate in the line at one or both end.	Details of tripping yet to be received.	From PMU, B-N fault observed and successful auto-reclosing from one end is observed.

Fault Clearance time has been computed using PMU Data from nearest node available and/or DR provided by respective utilities (Annexure- II)

***Yes, if written Preliminary report furnished by constituent(s)**

R-Y-B phase sequencing (Red, Yellow, Blue) is used in the list content.All information is as per Northern Region unless specified.

^^ tripping seems to be in order as per PMU data, reported information. However, further details may be awaited.

Reporting of Violation of Regulation for various issues for above tripping

1	Fault Clearance time(>100ms for 400kV	1. CEA Grid Standard-3.e 2. CEA Transmission Planning Criteria
2	DR/EL Not provided in	1. IEGC 5.2(r) 2. CEA Grid Standard 15.3
3	FIR Not Furnished	1. IEGC 5.9.6.a 2. CEA Grid Standard 12.2 (Applicable for SLDC, ALDC only)
4	Protection System	1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.A 2. CEA (Technical Standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1. (6.1, 6.2, 6.3)
5	A/R non operation	1. CEA Technical Standard of Electrical Plants and Electric Lines: 43.4.C 2. CEA Technical Planning Criteria

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	(i) Chief Engineer (Comm.); SE (SO & SLDC): 0181-2664440 Fax-0172-2560622
NHPC	(i) Sh. N.S.Parameshwaran, Executive Director (O&M), Faridabad – Fax-0129-2272413 (ii) Sh.V.K.Sinha, General Manager (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.S Kushwaha, General Manager (O&M), Jammu; Fax- 0191-2471187 (iv) Sh.Rajeev Sudan Dy, General Manager (OS), Fax- 0191-2471187
RRVUNL	(i) Sh. A.K. Saxena, Addl. Chief Engineer (PPMC & IT), Fax- 0141-2740989/44521
NTPC	(i) Head of OS/ Head of RCC, Fax No. 0120-2410082 (ii) Sh. Praveen Chaturvedi, GM (OS), NRHQ Lucknow; Fax-0522-2305849. (iii) DP Singh AGM –OS NRHQ NTPC LIMITED Lucknow
HPSEBL	(i) Chief Engineer (SLDC), HPSLDC (ii) SE (PR& ALDC), HPSLDC
NRLDC	General Manager - 26854861, 4051, 26569504 Fax- 26852747
NLDC	General Manager, NLDC, Fax: 011-26853488/26601079
Lanco APTL	Sh. Raj Kumar Roy, Director, Fax: 0124-2341627/4741024
SJVNL/NJHPS	General Manager (C&SO), Fax- 0177-2673283
PTCUL/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. GM (EM - Design), Rishikesh
PSTCL	(i) Chief Engineer (SLDC) Fax – 0175-2365340 (ii) Dy.Chief Engineer (SLDC) Fax – 0175-2365340
CHANDIGARH	Sh. M.P.Singh, SE (Elect. Op.Circle) – Fax-0172-2740505
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
RPSCCL	Sh. Niranjana Jena, Addl.VP/ Sh. Suvendu Dey, Asst. VP-O&M, Fax: 05842-300003
HPGCL	Sh. S.K. Wadhwa SE/Technical(HQ), Fax: 0172-5022436
CEA	(i) Sh. Vikram Singh, Director; Fax-26170385,26108834 (ii) Chief Engineer, NPC, New Delhi
TPDDL	(i) Sh. Sanjay Banga, VP, Tata power-DDL, New Delhi (Fax: 011-27468042) (ii) Sh. Praveen Verma, Addl. GM, Tata Power-DDL, New Delhi (Fax: 011-27468042)
PTC India Ltd.	Sh. Ajit Kumar, Director (Commercial & Operations), PTC India Ltd., New Delhi (Fax- 011-41659144,41659145)
AD Hydro	Sh. Anil Kumar Garg, General Manager(BD), AD Hydro Power Ltd., Noida-201301, (Fax: 0120-4323271/4278772)
DISCOM UP	Sh. Rakesh Kumar, Director (T), Dakshinanchal VVNL, Agra-282007 (Fax- 0562-2605465)

NPL Mr. Rajesh Kumar, Head Operations- 08427183924, Email id: Kumar.Rajesh@larsentoubro.com
Address: Nabha Power Limited, PO box 28, Near Village Nalash, Rajpura, Punjab 140401.

Mr. Ravinder Singh Lall, Head O&M – 09815355411, Email : Ravindersingh.lall@larsentoubro.com
Mr. Pinaki Mukherjee, Sr. DGM, Commercial – 09871391388, Email id: Pinaki.mukhejee@larsentoubro.com

HPPTCL	Director (Planning & Contracts), Fax: 0177-2626284
J&K (PDD)	Chief Engineer (Survey & Commercial) Fax-0191-2476213
J&K SPDCL	GM, Fax: 0194-2500145
PSPCL	Engineer-in- Chief (PPRR), Fax- 0175-2308698.
RRVNL	Chief Engineer (LD); SE (SO&LD) – Fax- 0141-2740920
UPRVUNL	DGM (TOM), 0522-2287861
UJVNL	General Manager Engineering: 0135-2761485, fax- 0135-2761549
NPCIL	(i) Station Director, NAPS; Fax. 05734-222177.(ii) Sr. Manager (Transmission), NPCILFax.-022-25563350
JPPVL	Sh. Suresh Chandra, Director, Fax- 0120-4516201/4609464/4609496
Jhajjar PL	Sh. Goutam Biswas, GM (Production), 01251-270155.
LPGCL	Nabha Power Ltd (Rajpura) Sh. A. N. Sar, Unit Head And Exec. Director, Fax- 91-22-22048681

Talwandi saboo Pvt ltd Amit Mittal,GM- Power Sales, Strategy & Corporate Affairs,Talwandi Saboo