North Eastern Regional Power Committee

Agenda
For
27th PCC Sub-Committee Meeting

Time of meeting : 14:00 Hrs.

Date of meeting : 12th November, 2014 (Wednesday)

Venue : "Hotel Nandan", Guwahati.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 26th MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

The minutes of 26th meeting of Protection Sub-committee held on 15th October, 2014 at Guwahati were circulated vide letter No. NERPC/SE (O)/OCC/2014/2018-2053 dated 24th October, 2014.

No observations or comments were received from the constituents. The Sub-committee may discuss & confirm minutes of 26th PCCM of NERPC.

ITEMS FOR DISCUSSION

A.1 Implementation of 3-phase Auto Reclosure Scheme in all lines connected to Khandong and Kopili HEP:

For reliable operation of Power system it is required to implement 3-Phase Auto Reclosure Scheme in all the 132kV lines connected to Kopili and Khandong HEP of NEEPCO. The lists of such lines are:

a) 132kV Khliehriat – Khandong # 1
b) 132kV Khliehriat – Khandong # 2
c) 132kV Haflong – Khandong
d) 132kV Kopili – Khandong # 1
e) 132kV Kopili – Khandong # 2

During 26th PCC meeting, NEEPCO representatives stated that breakers reached the site and maybe expected to be commissioned within one month.

POWERGRID representative stated that: -

1) 132kV Khandong – Khliehriat - II

3 phase auto-reclosure has been implemented.

2) 132kV Khandong – Khliehriat - I

The pre-installation works for implementation of 3 phase auto- recloser scheme are completed.

Regarding enhancement of bus capacity, NEEPCO was requested to intimate the status within a month. Representative of NEEPCO informed that concerned officer was not available, the matter maybe referred to OCC for further deliberation.

It was discussed that charging of any feeder at Khandong through transfer bus is not possible because of lower capacity of main bus conductor. Strengthening of Khandong bus has already been discussed in earlier RPC forum. NEEPCO will intimate the status by next OCC/PCC & expedite thereof.

POWERGRID intimated that meanwhile 3phase auto-reclosure will be implemented for the circuits given below:

1) 132kV Khandong –Khliehriat-II
2) 132kV Kopili-Khandong-II where both end bays are owned by POWERGRID and relays and CBs are suitable for TPAR

NEEPCO may intimate the latest status and committee may like to discuss.

A.2 Implementation of 3-Phase Auto Reclosure Scheme of Radially fed 132kV Lines connected to Ranganadi HEP:

At present, the power flows to Nirjuli, Gohpur and Ziro radially from Ranganadi HEP and any transient fault in line causes undesirable outages. Hence, to avoid outages during transient fault it is essential to implement 3- Phase Dead Line charging of following 132kV Lines.

a) 132kV Ranganadi – Nirjuli Line (Dead Line Charging at RHEP)
b) 132kV Nirjuli – Gohpur Line (Dead Line Charging at Nirjuli)
c) 132kV Ranganadi – Ziro Line (Dead Line Charging at RHEP)

During the 26th PCC meeting, NEEPCO representative stated that the design cell would be visiting the site during November 2014, the scheme would be implemented once clearance is given by design cell. The status will be reviewed in next PCC meeting.

The Sub-committee requested NEEPCO to look into the matter at the earliest as this is a system requirement and status should be spelt out in the next PCC meeting. NEEPCO agreed.

NEEPCO may intimate the latest status and committee may like to discuss.

A.3 Implementation of islanding scheme in NER

The proposed islanding schemes have been studied and discussed in detail by the system study group on 14.10.2014 at NERLDC, Shillong. The minutes of the meeting along with suggestions are attached at **Annexure A.3**

Members may kindly note.

A.4 Testing of protective relays of downstream system of 132kV Khliehriat (Me.ECL) Sub Station:

All downstream faults of 132kV Khliehriat (Me.ECL) Sub Station gets reflected to 132kV Khliehriat (PG) Sub Station causing greater isolation of system. Hence, it is essential that Me.ECL should carry out testing of downstream Relays at 132kV Khliehriat (Me.ECL) Sub Station and based on the condition of relays further course of action may be decided. In case the relays are found defective POWERGRID will revise the existing relay setting at 132kV Khliehriat (PG) Sub Station in such a way that expedite tripping of both 132kV Khliehriat – Khliehriat Line # 1 & 2 occurs during downstream fault to avoid undesirable isolation of Lines at upstream.

As suggested by Member Secretary I/C NERPC, it was agreed to prioritize the 3rd party audit reports of NERPC so that most important items to be replaced may be identified. The prioritized reports may then be pursued for funding from PSDF.

Me. PTCL may intimate the latest status.

A.5 Transmission Availability verification for ISTS elements:

Procedure for calculation of Transmission system availability factor for a month as per CERC Regulation 2014-19.

As per Central Electricity Regulatory Commission (Terms and conditions of Tariff) Regulations, 2014-19 .Transmission System Availability factor for a calendar month (TAFM) w.e.f. 1st April 2014 shall be calculated by the respective transmission licensee, got verified by the concerned RLDC and certified by the Member Secretary, Regional Power Committee of the region concerned separately for each AC and HVDC transmission system.

The PCC/OCC forum have agreed to the important points on the regulation regarding transmission availability calculations as follows:

- For AC system, two trippings per year shall be allowed.
- After two trippings in a year, additional 12 hours outage shall be considered in addition to the actual outage
- In case of outage of a transmission element affecting evacuation of power from the generating station, outage hour shall be multiplied by a factor of 2.
- The weightage factor for each category of transmission elements shall be calculated as per regulation.

The procedure for finalizing certification by NERLDC was deliberated in detail and the following points were agreed: -

Planned Outages: -

1. In all cases of outages, RLDC will certify the actual outage period. The outage period will be cross-checked with the approved outage period in OCC forum. All planned outages should be availed by the executing agency as approved in the OCC forum.

2. Any deferment from approved outage hours and approved outage days may be intimated by the agency to NERPC with a copy to NERLDC, justifying the reason of deferment. The deferred hours/ days without proper justification will be deducted from the availability period.

Emergency Outages: -

1. Outages beyond the control of the agency when neither RPC nor RLDC could be informed earlier and immediate remedial actions are required.
2. Outages planned in OCC forum but are of emergency in nature like tower in danger; CBs need immediate replacement, etc. However, the agency has to intimate RPC with a copy to RLDC.
3. Outages that cannot be delayed till next OCC forum for proper approval.
4. However, the agency has to intimate RLDC with the reason of outage for all the above cases which may be approved in OCC forum.

Transient Outages: -

1. Outages that are of transient in nature due to lightning, mal-operation of relays, etc.
2. Transient Earth Fault, Auto-reclosure, phase-to-phase fault, etc.
3. Outages due to infringements.
4. However, the agency has to intimate RLDC with the reason of outage for all the above cases which may be approved in OCC forum.

Outages due to others: -

1. Outages due to fault in the downstream protection.
2. Outages as per direction of RLDC for desired system condition.
3. Outages due force majeure/ Acts of God.
4. However, the agency has to intimate RLDC with the reason of outage for all the above cases which may be approved in OCC forum.

Force Majeure: -

1. Act of God including lightning, drought, fire and explosion, earthquake, volcanic eruption, landslide, flood, cyclone, typhoon, tornado, geological surprises, or exceptionally adverse weather conditions which are in excess of the statistical measures for the last hundred years; **or**
2. Any act of war, invasion, armed conflict or act of foreign enemy, blockade, embargo, revolution, riot, insurrection, terrorist or military action; **or**
3. Industry wide strikes and labour disturbances having a nationwide impact in India;
4. However, the agency has to intimate RLDC with the reason of outage for all the above cases which may be approved in OCC forum.

Conditions given in SoR: -

1. Only 2 trippings per annum allowed for each AC system, additional 12 hours may be added for each tripping in case of trippings more than 2 in a year.
2. Further, in case of outage of a transmission element affecting evacuation of power from a generating station, outage hours shall be multiplied by a factor of **2**.

In the 102nd OCC meeting, DGM (MO), NERLDC also gave a presentation proposing the procedure for transmission availability certification. Members agreed to the proposal of NERLDC except the following points: -

1. Constituents may be allowed to study the outage data submitted by NERTS on weekly basis after uploading the same in NERTS website. Then more time will be available for comments to be submitted by next OCC.

2) Outage certification of period from April 2014 to June 2014 need to be revised as the same will have effect on number of trippings in a year. Further, constituents are not given the evidence provided by transmission licensees for claiming force majeure due to lightning.

DGM, NERTS also gave a presentation explaining the different waveforms recorded during infringements, lightning, etc.

The Sub-Committee may like to discuss.

A.6 Implementation of the recommendations of the Protection Audit:

As per para no 27 of CERC order in Petition No. 220/MP/2012 on 21.02.14,the deficiencies, if any, in Category-A (the deficiencies which can be corrected without any procurement) shall be rectified by the concerned STU and CTU within 2 months of issue of the order and compliance report in this regard shall be submitted to NERPC. **All deficiencies of Category-B (deficiencies involving procurement of equipment) shall be rectified within 6 months of issue of the order**. In this regard, reasons of non-availability of fund or delay in procurement process shall not be accepted. The procurement and implementation is to be completed by each STU using their own fund which can be reimbursed through a common request of funding through PSDF forwarded through NERPC as per procedure recently approved by Government of India.

During 26th PCC meeting, DGM, POWERGRID informed that issue of implementation of Bus Bar protection system at Dimapur S/S as recommended under category-B has already been taken up. Target Completion : January, 2015

Constituents of NER are requested to intimate the status of rectification of protection deficiencies under Category A & Category B.

A.7 Implementation of Auto Reclosure Scheme in 132kV Jiribam (PG) - Loktak and 132kV Imphal (PG) – Loktak Line:

The external Auto Reclose Relay Type VARM and MGA are already obsolete and without service support from OEM. At Loktak HEP, the AR Relay Type VARM and MGA of 132kV Jiribam (PG) and 132kV Imphal (PG) are not tested since 2008 and so healthiness could not be ensured. Further, during March'14 NHPC has installed Numerical DPR Type P442 of M/S Alstom Make in the said feeders. Further, the Old / Obsolete CBs are already replaced with SF6 CB. Hence, Auto Reclosure Scheme may be implemented in 132kV Jiribam (PG) - Loktak and 132kV Imphal (PG) – Loktak Line immediately by activating internal Auto Reclosure of Numerical DPR to avoid use of obsolete Auto Reclose Relay Type VARM and MGA.

In the 26th PCC meeting, the status could not be updated.

Committee may like to discuss.

A.8 Removal of Obsolete DPR Type THR-3 and SSRR3V from 132kV Jiribam (PG) and 132kV Imphal (PG) Feeder:

As per the existing practice, the protection scheme for 132kV Lines is Single Main and Backup Protection. During March'14 NHPC has already installed Numerical DPR Type P442 of M/S Alstom Make in 132kV Jiribam (PG) and 132kV Imphal (PG) feeders. However, the obsolete DPRs viz. THR-3 and SSRR3V of 132kV Jiribam (PG) and 132kV Imphal (PG) feeders have not been disconnected from the scheme which is unsafe so far as reliable protection is concerned considering the probability of mal-operation of the obsolete relays. There are instances of undesirable tripping of 132kV Jiribam (PG) – Loktak Line on account of mal-

operation of old DPR at Loktak HEP. NHPC should disconnect the Old and Obsolete DPRs immediately.

In the 26th PCC meeting, the status could not be updated.

Committee may like to discuss.

A.9 Rectification of CT Switching relays of 220kV Bus Bar Protection Scheme at 400/220kV Balipara Sub Station by AEGCL:

The 220kV Bus Bar Protection Scheme at 400/220kV Balipara Sub Station operated on 28.09.2014 during operation of Bus Transfer Scheme. On investigation it was found that the CT Switching Relay contact of 50MVA ICT Bay was not operating for Zone – B. Matter was referred to AEGCL for necessary rectification.

During 26th PCC meeting, AEGCL representative informed that approval for procurement of VAJH-11 relay from M/s Areva is awaited. The same may be expected to be installed by end of October'14.

AEGCL may kindly intimate the current status.

A.10 Submission of Information/Data required for preparation of final report of Grid Disturbance in NER on 25.07.2014:

As discussed in 26th PCC meeting of NERPC, the following information which are yet to be received from the constituents are to be furnished by the constituents for preparation of final report of Grid Disturbance in NER on 25.07.14:-

a. Exact time of tripping & relay flags of following elements at millisecond stamping:

i. Ranganadi Unit II & III
ii. Palatana GTG 1 & STG 1
iii. AGBPP Unit I, II, III, IV, V, VII, VIII & IX
iv. AGTPP Unit I, II, III & IV
v. Loktak Unit I, II & III
vi. Kopili Unit I & IV
vii. Khandong Unit I
viii. Doyang Unit III
ix. Kopili St II Unit I
x. Units of TSECL (Baramura, Rokhia & Gumti)
xi. Units of MePGCL (Umium St I/ St II/St III/St IV, Umtru & Leshka)
xii. Units of APGCL (LTPS, NTPS & Langpi)

xiii. Units of DOP, Nagaland (Likimro)

xiv. 400 kV Silchar – Byrnihat line at Byrnihat (exact time)

xv. 132 kV Ranganadi – Nirjuli line at Ranganadi

xvi. 132 kV Nirjuli – Gohpur line at Gohpur

xvii. 220 kV Azara – Sarusajai I line at Azara and Sarusajai

xviii. 220 kV Azara – Sarusajai II line at Azara and Sarusajai

xix. 220 kV Misa – Mariani I line at Misa and Mariani

xx. 220 kV Misa – Mariani II line at Misa and Mariani

xxi. 400/220 kV, 315 MVA ICT I at Byrnihat (both ends)

xxii. 400/220 kV, 315 MVA ICT II at Byrnihat (both ends)

xxiii. 220/132 kV, 160 MVA ICT I at Byrnihat (both ends)

xxiv. 220/132 kV, 160 MVA ICT II at Byrnihat (both ends)

xxv. 220 kV Misa – Samaguri I line at Samaguri

xxvi. 220 kV Misa – Samaguri II line at Samaguri

b. Clarification of following points:

i. 220/132 kV, 2x50 MVA Balipara ICTs tripped on overcurrent when these ICTs feed radial loads only. Reason of tripping.

ii. 400/220 kV, 315 MVA ICT at Bongaigaon tripped on Dir. O/C, E/F. DR output from Samaguri shows that 220 kV Balipara – Samaguri line tripped before tripping of Bongaigaon ICT. Whether 220 kV Balipara – Samaguri line tripped after tripping of Bongaigaon ICT. Time Synchronization of DR installed at Samaguri with other DRs is to be checked.

iii. As informed by AEGCL, 220 kV Azara – Boko line tripped on overvoltage from Azara end. Just before tripping of this line, NER system was under steady state condition. Whether 220 kV BTPS – Agia tripped.

iv. Reason for Overflux tripping of 400/220kV, 2x315 MVA ICTs and 220/132 kV, 2x160 MVA ICTs at Byrnihat.

c. Further information:

i. Substation Event Loggers output from 400/220 kV Bongaigaon, 400/220 kV Balipara, 400/220 kV Misa, 400/132 kV Ranganadi, 220/132 kV BTPS, 400/220/132 kV Azara, 220/132 kV Samaguri, 400/220/132 kV Byrnihat & 400/132 kV Silchar sub-stations.

ii. Disturbance Recorder output of all elements mentioned as per Sl. No. 1.a.xiv to 1.a.xxvi.

iii. Quantum of feeder wise UFR based load shedding of each constituent.

iv. Whether any island formed in Upper Assam system.

A.11 Implementation of recommendation of the committee on Grid Disturbance of Category V in NER on 25.07.2014:

A committee was constituted by POSOCO to enquire about the causes of the disturbance in NER Grid occurred on 25.07.14. The committee submitted its report to the PCC forum of NERPC (26th PCCM). PCC forum of NERPC had requested NERLDC to submit the remedial measures pertaining to the Grid Disturbance in NER occurred on 25.07.14 to the constituents of NER. Letter No 56005-18 dtd 30.10.14 was sent to all constituents of NER which is attached at **Annexure- 11** for implementation of recommendation of the committee on Grid Disturbance of Category V in NER on 25.07.14.

Committee may like to discuss.

A.12 Furnishing list of Numerical Relays installed at bus bars and ends of transmission line & transformers:

As per section 43.4.a of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, numerical relays shall be provided for transmission lines, transformers and bus bars.

Constituents are requested to furnish list of **Numerical Relays** installed at bus bars and ends of transmission line & transformers and list of inbuilt features of these numerical relays as per enclosed format in **Annexure - B**.

Constituents are also requested to furnish list of **Disturbance Recorder**, **Event Logger/Sequential Event Recorder**, **Fault Locator** and **Data Acquisition System (DAS)** installed/activated at ends of transmission line & transformers as per enclosed format in **Annexure - B**.

Committee may like to discuss.

A.13 Issues related to protection and relay setting co-ordination:

As per section 5.2.l of IEGC, provision of protections and relay settings shall be co-ordinated periodically throughout the Regional Grid, as per plan to be separately finalized by the Protection sub-committee of the RPC.

It has been observed that number of multiple elements tripping increases. It is required to review Protection and relay setting co-ordination to minimize multiple elements tripping.

Committee may like to discuss.

A.14 Furnishing protection details of Transmission Lines, Transformers, Reactors and Bus Bars:

As per section 43.4.c (Schedule V) of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, Protection system of **400 kV lines** consists of Main I, Main II, DEF, Two Stage Over Voltage, Auto Reclosing and Carrier Aided Inter Tripping. Protection system of **220 kV lines** consists of Main I, Main II/Over Current & DEF, Auto Reclosing and Carrier Aided Inter Tripping. Protection system of **132 kV lines** consists of Main I, Over Current & DEF, Auto Reclosing and Carrier Aided Inter Tripping.

Constituents are requested to furnish **Protection Details of Transmission Lines** as per enclosed format in **Annexure - B**.

As per section 43.4.c (Schedule V) of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, Protection system of **Transformer** consists of Differential Protection, Over Flux Protection, REF Protection, Backup Directional Over Current and Earth Fault Protection (HV & LV side)/Impedance Protection, Buchholz, WTI, OTI, MOG, OSR for OLTC, PRD, SA, Tertiary Winding Protection, Over Load Alarm.

Constituents are requested to furnish **Protection Details of Transformer** as per enclosed format in **Annexure -B**.

As per section 43.4.c (Schedule V) of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, Protection system of **Reactor** consists of Differential Protection, REF Protection, Backup Definite Time Over Current and Earth Fault Protection/Impedance Protection, Buchholz, WTI, OTI, MOG, SA.

Constituents are requested to furnish **Protection Details of Reactor** as per enclosed format in **Annexure -B**.

As per section 43.4.c (Schedule V) of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, Bus Bar Protection and Local Breaker Backup Protection are to be provided in 220 kV and above voltage interconnecting sub-station and all generating station switchyards.

Constituents are requested to furnish **Bus Bar Protection and Local Breaker Backup Protection** as per enclosed format in **Annexure -B**.

Committee may like to discuss.

A.14 Grid Incidences during October, 2014:

The following numbers of Grid Disturbances (GD) occurred during the period **w.e.f 01st October, 2014 to 26th October, 2014** :-

Sl No	Control Area	Grid Disturbance in nos	
		Oct'14 (till 26th)	Jan'14 to Oct'14(till 26th)
1	Palatana	0	8
2	AGBPP	0	6
3	AGTPP	0	9
4	Ranganadi	0	1
5	Kopili	0	2
6	Khandong	1	5
7	Doyang	0	2
8	Loktak	1	6
9	Arunachal Pradesh	0	10
10	Assam	2	38
11	Manipur	5	45
12	Meghalaya	1	16
13	Mizoram	1	14
14	Nagaland	1	18
15	Tripura	2	14

Sl No	Category of GD	Grid Disturbance in nos	
		Oct'14 (till 26th)	Jan'14 to Oct'14(till 26th)
1	GD 1	12	106
2	GD 2	0	14
3	GD 3	0	2
4	GD 4	0	3
5	GD 5	0	2
	Total	**12**	**127**

This is for information to the members. Remedial actions are to taken by the concerned power utilities of NER

A.15 Written reporting of events by constituents to NERLDC:

As per section 5.9.6 of IEGC, written report of events by constituents is to be sent to NERLDC with the following details:-

Time and Date of Event, **Location**, Plant and/or equipment directly involved, **Description and cause of event**, Antecedent conditions of Load and Generation, including frequency, voltage and the flows in the affected area at the time of tripping including weather condition prior to the event, **Duration of interruption and Demand and/or generation (in MW and MWh) interrupted**, All relevant system data including copies of records of all recording instruments including Disturbance Recorder, Event Logger, DAS etc, **Sequence of tripping with time**, Details of Relay Flags and **Remedial measures**.

Events occurred during period w.e.f 22.09.14 to 26.10.14 are given below. Constituents are requested to submit the information which was not furnished earlier as per attached format for analysis of root cause of tripping.

Committee may like to discuss.

A.16 Root cause analysis of tripping of multiple elements:

i. At 1508 Hrs on 07.10.14, 220 kV Sarusajai - Langpi I line **(Sarusajai: DP, ZI, Y-B-E & Langpi: DP, ZI, Y-B-E)** & 220 kV Sarusajai - Langpi II **(Relay Flag: Not furnish)** lines tripped.
Due to tripping of these elements, there was loss of 100 MW generation of Langpi.

Grid Disturbance: GD I

Analysis of events:

It appears from the relay flags that fault was at 220 kV Sarusajai – Langpi I line, which were not cleared timely by Sarusajai. Due to delayed clearance of this fault, fault was seen by 220 kV Sarusajai – Langpi II line at Sarusajai & the line tripped.

These elements were radially connected.

For further analysis of these events, DR & EL output are required.

AEGCL may explain

ii. At 1110 Hrs on 15.10.14, 220 kV Sarusajai - Langpi I line **(Sarusajai: DP, ZI, B-E & Langpi: Not furnish)** & 220 kV Sarusajai - Langpi II **Relay Flag: Not furnish)** lines tripped.

Due to tripping of these elements, there was loss of 100 MW generation of Leshka & Khandong.

Grid Disturbance: GD I

Analysis of events:

It appears from the relay flags that fault was at 220 kV Sarusajai – Langpi I line, which were not cleared timely by Sarusajai. Due to delayed clearance of this fault, fault was seen by 220 kV Sarusajai – Langpi II line at Sarusajai & the line tripped.
These elements were radially connected.

For further analysis of these events, DR & EL output are required.

***AEGCL may explain*.**

iii. At 0330 Hr on 28.09.14, 220/132 kV, 50 MVA ICT I at Balipara **(Relay: Not furnished)**, 132 kV Balipara – Depota line **(Balipara: DP, ZI, R-E & Depota: No tripping)**, 132 kV Balipara – Gohpur line **(Balipara: DP, ZI, RY-E & Gohpur: No tripping)** & 132 kV Balipara – Khupi line **(Balipara: DP, ZI, RY-E & Khupi: Not furnished)** tripped.

Due to tripping of these elements, power supply to Depota area of Assam and Khupi area of Arunachal Pradesh interrupted.

Grid Disturbance: GD I

Analysis of events:

As 132 kV Balipara – Depota line, 132 kV Balipara – Gohpur line & 132 kV Balipara – Khupi line were connected radially, it was not understood why these lines tripped simultaneously. For Root cause analysis, DR & EL output are required.

POWERGRID, AEGCL may explain

iv. At 1240 Hr on 28.09.14, 220 kV Balipara – Samaguri line, 220/132 kV, 50 MVA ICT I at Balipara, 220/132 kV, 50 MVA ICT II at Balipara, 132 kV Balipara – Depota line, 132 kV Balipara – Khupi line tripped. **Bus Bar Protection operated at Balipara**

Due to tripping of these elements, power supply to Depota area of Assam and Khupi area of Arunachal Pradesh interrupted.

Grid Disturbance: GD I

Analysis of events:

It appears that these elements are tripped due to operation of bus bar protection at Balipara. These elements were connected radially.

POWERGRID may explain

v. At 1144 Hrs on 02.10.14, 132 kV Imphal (PG) - Imphal (MSPCL) I line **(Imphal(PG) : Dir EF & Imphal(MSPCL) : Not furnish)** & 132 kV Imphal (PG) - Imphal (MSPCL) II line **(Imphal(PG) : Dir EF & Imphal(MSPCL) : Not furnish)** tripped.

Due to tripping of these elements, power supply to Imphal area of Manipur interrupted.

Grid Disturbance: GD I

Analysis of events:

These elements were connected radially. It is not known whether any fault was persisted in downstream element of MSPCL. Relay flag details at Imphal (MSPCL) not furnished.

MSPCL may explain

vi. At 1345 Hrs on 13.10.14, 132 kV Imphal (PG) - Imphal (Manipur) I line **(Imphal (PG) : Dir EF & Imphal (MSPCL) : Not furnish)** & 132 kV Imphal (PG) - Imphal (Manipur) II line **(Imphal(PG) : Dir EF & Imphal (MSPCL): Not furnish)** tripped.

Due to tripping of these elements, power supply to Imphal area of Manipur interrupted.

Grid Disturbance: GD I

Analysis of events:

These elements were connected radially. It is not known whether any fault was persisted in downstream element of MSPCL. Relay flag details at Imphal (MSPCL) not furnished.

MSPCL may explain

vii. At 1451 Hrs on 13.10.14, 132 kV Imphal (PG) - Imphal (Manipur) I line **(Imphal(PG) : Dir EF & Imphal (MSPCL) : Not furnish)** & 132 kV Imphal (PG) - Imphal (Manipur) II line **(Imphal(PG) : Dir EF & Imphal(MSPCL) : Not furnish)** tripped.

Due to tripping of these elements, power supply to Imphal area of Manipur interrupted.

Grid Disturbance: GD I

Analysis of events:

These elements were connected radially. It is not known whether any fault was persisted in downstream element of MSPCL. Relay flag details at Imphal (MSPCL) not furnished.

MSPCL may explain

viii. At 1410 Hrs on 18.10.14, 132 kV Loktak – Jiribam line **(Loktak : DP, Z-I, RY-E & Jiribam: DP, Z-I, RY-E)**, 132 kV Dimapur – Imphal line (**Dimapur: DP, Z-II, RY-E & Imphal: No tripping)** tripped.

Due to tripping of these elements, power supply to major part of Manipur interrupted and there was 50 MW generation of Loktak.

Grid Disturbance: GD I

Analysis of events:

It appears from the relay flags that fault was at 132 kV Loktak – Jiribam line, which were not cleared timely by Jiribam. Due to delayed clearance of this fault, fault was seen by 132 kV Dimapur – Imphal line at Dimapur & the line tripped.

For further analysis of these events, DR & EL output are required.

POWERGRID may explain

ix. At 0955 Hrs on 04.10.14, 132 kV Udaipur – Palatana line **(Udaipur: No tripping & Palatana: DP, Z-I, B-E)** & 132 kV Udaipur – Rokhia **(Udaipur: No tripping & Rokhia: O/C)** line tripped.

Due to tripping of these elements, power supply to Udaipur area of Tripura interrupted.

Grid Disturbance: GD I

Analysis of events:

It appears from the relay flags that fault was at 132 kV Udaipur – Palatana line, which were not cleared by Udaipur. Due to non-clearance of this fault, fault was seen by 132 kV Udaipur – Rokhia line at Rokhia & the line tripped.

For further analysis of these events, DR & EL output are required.

TSECL may explain

x. At 1037 Hrs on 15.10.14, 132 kV Udaipur – Palatana line **(Udaipur: No tripping & Palatana: DP, Z-I, B-E)** & 132 kV Udaipur – Rokhia line **(Udaipur: E/F & Rokhia: No tripping)** tripped.

Due to tripping of these elements, power supply to Udaipur area of Tripura interrupted.

Grid Disturbance: GD I

Analysis of events:

It appears from the relay flags that fault was at 132 kV Udaipur – Palatana line, which were not cleared by Udaipur. Due to non-clearance of this fault, fault was seen by 132 kV Udaipur – Rokhia line at Udaipur & the line tripped. It is to be checked whether E/F relay of 132 kV Udaipur – Rokhia line at Udaipur is directional.

For further analysis of these events, DR & EL output are required.

TSECL may explain

xi. At 0101 Hrs on 16.10.14, 132 kV Khliehriat (PG) - Khliehriat (MePTCL) I line **(Khliehriat(PG): DP, Z-III, Y-E & Khliehriat(MePTCL): No tripping)**, 132 kV Khliehriat (PG) - Khliehriat (MePTCL) II line **(Khliehriat(PG): No tripping & Khliehriat (Me. PTCL): E/F)**, 132 kV Khandong - Khliehriat I line **(Khandong: E/F & Khliehriat(PG): No tripping)**, 132 kV Khandong - Khliehriat II line **(Khandong: E/F & Khliehriat(PG): No tripping)**, 132 kV Khliehriat – Badarpur line (**Khliehriat(PG): E/F & Badarpur : No tripping)** tripped.

Due to tripping of these elements, power supply to Khliehriat area of Meghalaya interrupted and there was 66 MW generation of Langpi.

Grid Disturbance: GD I

Analysis of events:

It appears from the relay flags that fault were persisted in downstream element of Khliehriat area of Meghalaya, which was not cleared timely. The fault was seen by the above elements and the lines tripped. It is to be checked whether E/F relays of 132 kV Khliehriat (PG) - Khliehriat (Me. PTCL) II line at Khliehriat (Me. PTCL) & 132 kV Khliehriat – Badarpur line at Khliehriat (PG) are directional.

For further analysis of these events, DR & EL output are required.

POWERGRID & Me. PTCL may explain

Any other item:

Date and Venue of next PCC

It is proposed to hold the 28th PCC meeting of NERPC on second week of December, 2014. The exact venue will be intimated in due course.

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ANNEXURE - 3

Implementation of Islanding Scheme in NER:

During the 94thOCC meeting, the committee had decided the following islanding scheme and associated frequencies levels for creation of islands in NER:

SN	Islanding Scheme	Lines required to be opened	UFR Location	Implementing Agency
1	**ISLAND AT 48.80 Hz with 5 Sec delay:** Island comprising of generating units of AGBPP (Gas), NTPS (Gas) & LTPS (Gas) and loads of Upper Assam system & Deomali area (Ar. Pradesh) **[Total Generation: 380-400MW and load: 200MW (off peak)-300MW (peak)]**	(a) 220 kV New Mariani (PG) – AGBPP	UFR-1 [At New Mariani (PG)]	**PGCIL**
		(b) 220 kV Mariani – Misa	UFR-2 [At Mariani, Samaguri of AEGCL]	**AEGCL**
		(c) 220 kV Mariani – Samaguri		
		(d) 132 kV Mokokchung – Mariani		
		(e) 132 kV Dimapur (PG) – Bokajan	UFR-3 [At Dimapur (PG)]	**PGCIL**
		(f) Generators to be desynchronized for reduction of generation [if Generation > Load in the islanded pocket]		
		(g) De-synchronization / isolation of one GT and one ST from each of two modules of AGBPP, which are in operation, leading to reduction of generation of about 80-90 MW [i.e each module will contribute to reduction of about 40-45 MW (GT:30MW+ST:15MW)].	At AGBPP [UFRs of line bays & Generator to be used]	**NEEPCO**
		(h) Lines required to be opened for load shedding of 30MW (off-peak) and 50MW (peak) [if load > generation in the islanded pocket]		
		(i) 132kV Tinsukia – Ledo S/C line (at 48.7Hz instantaneous).	UFR [At Tinsukia]	**AEGCL**
		(j) 66kV Tinsukia – Rupai S/C line (at 48.6Hz instantaneous)		**AEGCL**

		(k) 132kV Jorhat – Bokakhat line (at 48.5Hz instantaneous)	UFR [At Jorahat / Bokakhat]	**AEGCL**
2	**<u>ISLAND AT 48.50 Hz with 5 Sec delay :</u>** Island comprising of generating units of AGTPP (Gas), generating units at Baramura (Gas), Rokhia (Gas) & Gumati (Hydro) and loads of Tripura system & Dullavcherra area (Assam) **[Total Generation: 150-160MW and load: 110MW (off-peak) &170-180MW (peak)]**	132 kV Palatana – Udaipur	UFR-1 [At Palatana]	**OTPC**
		132 kV Palatana – Surjamani Nagar		
		132 kV Silchar – Dullavcherra	UFR-2 [At Silchar]	**PGCIL**
		132 kV AGTPP – Kumarghat	UFR-3 [At Kumarghat]	**PGCIL**
		132 kV P K Bari – Kumarghat		
3	**<u>ISLAND AT 47.90 Hz:</u>** Isolation of NER from NEW grid at ER-NER boundary with rest of the generation and load of NER	To be decided after system study		

<u>Deliberation of the Committee</u>

1. <u>ISLAND AT 48.80 Hz with 5 Sec delay</u>:

A. <u>POWERGRID, NERTS has to implement the revised time setting of UFR from existing 5 Secs to 500 ms for the following lines:</u>

a) 220 kV New Mariani (PG) – AGBPP, at New Mariani (PG)

DGM, NERTS informed that the UFR & Relay setting of the same with 500 ms delayed has already been implemented.

B. AEGCL has to implement the revised time setting of UFR from existing 5 Sec to 500 ms for the following lines:

b) 220 kV Mariani – Misa, at Mariani

Assam informed that the UFR & Relay setting of the same with 500 ms delayed has already been implemented at both ends.

c) 220 kV Mariani – Samaguri, at Samaguri

Assam informed that the UFR & Relay setting of the same with 500 ms delayed has already been implemented at Samaguri end.

d) 132 kV Dimapur (PG) – Bokajan, at Dimapur (PG)

The UFR & Relay setting of the same with 500 ms delayed has already been implemented at Dimapur end.

e) 132 kV Mokokchung – Mariani, at Mariani

Assam informed that the line is normally in open condition and out of service- the question of setting does not arise.

C. NEEPCO has to implement the revised time setting of UFR from existing 5 Sec to 500 ms for the following generation:

f) Generators to be desynchronized for reduction of generation [if Generation Load in the islanded pocket]

g) De-synchronization / isolation of one GT and one ST from each of two modules of AGBPP, which are in operation, leading to reduction of generation of about 80-90 MW [i.e each module will contribute to reduction of about 40-45 MW (GT:30MW+ST:15MW)]

The scheme is proposed to be implemented at AGBPP utilizing UFRs of line bays & Generator.

NEEPCO informed the above scheme has already been implemented.

D. Lines required to be opened for load shedding of 30MW (off-peak) and 50MW (peak) [if load > generation in the islanded pocket]

h) 132kV Tinsukia – Ledo S/C line (at 48.7Hz instantaneous) at Tinsukia

i) 66kV Tinsukia – Rupai S/C line (at 48.6Hz instantaneous) at Tinsukia

j) 132kV Jorhat – Bokakhat line (at 48.5Hz instantaneous) at Jorhat/Bokakhat

Assam informed that they agree to implement the above scheme if require and at the same time request NERLDC to conduct a system study and suggest the settings for above lines.

The Sub-committee is of the opinion that the above lines may not be required for implementation at present- and if necessary, the same will be reviewed again.

In view of the above, the Islanding Scheme No.1 is now taken as completed.

2. ISLAND AT 48.50 Hz with 5 Sec delay :

Island comprising of generating units of AGTPP (Gas), generating units at Baramura (Gas), Rokhia (Gas) & Gumati (Hydro) and loads of Tripura system & Dullavcherra area (Assam)

[Total Generation: 150-160MW and load: 110MW (off-peak) &170-180MW (peak)]

A. POWERGRID, NERTS has to implement the revised time setting of UFR from existing 5 Sec to 500 ms for the following lines:

(a) 132 kV Silchar – Dullavcherra, at Silchar

Since the above line has already been considered in Pallatana SPS scheme, the Sub-committee agreed to drop from the proposal scheme.

(b) 132 kV P.K. Bari – Kumarghat, at Kumarghat

(c) 132 kV AGTPP – Kumarghat, at Kumarghat

DGM, NERTS informed that the UFR & Relay setting of the same with 500 ms delayed has already been implemented at Kumarghat end.

A. OTPC has to implement the revised time setting of UFR from existing 5 Sec to 500 ms for the following lines:

(d) 132 kV Palatana – Udaipur, at Pallatana
(e) 132 kV Palatana – Surjamani Nagar, at Pallatana

OTPC agreed to complete the above scheme by October, 2014.

3. <u>ISLAND AT 47.90 Hz</u>:

Isolation of NER from NEW grid at ER-NER boundary with rest of the generation and load of NER.

After detail deliberation, it was agreed that the case may be dropped for the time being and if necessary the same will be reviewed later.

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