Agenda of 5th System Studies Meeting in NER

Date: 20.05.2015. Venue: Hotel Pragati Manor, Guwahati

1. Review of SPS I, SPS II, SPS III & SPS IV related to Palatana GBPP, OTPC after commissioning of Palatana Module II

The following four (4) System Protection Scheme (SPS) associated with generating Unit-1 (363.3MW) of OTPC at Palatana has been implemented:

SPS I (implemented w.e.f 14.09.13):

In case of tripping of Module I of Palatana, OTPC, load will be disconnected by tripping of the following elements:

132 kV Silchar- Srikona D/C
132 kV Silchar- Panchgram
132 kV Badarpur- Panchgram
132 kV Silchar-Dullavcherra-Dharmanagar

During 4th System Studies Meeting, OTPC informed that SPS I was implemented by them on 19.04.15 in case of tripping of Module I & Module II. NERLDC informed that SPS I will be reviewed once the plant is generating to full capacity. At present, OTPC is generating around 500 MW.

Members may kindly note.

SPS II (implemented w.e.f 23.02.15):

In case of tripping of 400 kV Palatana- Silchar D/C lines (with Module I generation of Palatana, OTPC), load will be disconnected by tripping of the following elements:

132 kV Silchar - Srikona D/C
132 kV Silchar - Panchgram
132 kV Badarpur - Panchgram
132 kV Silchar - Dullavcherra - Dharmanagar

And Generation of Palatana, OTPC will be reduced to around 20 MW excluding their auxiliary consumption.

During 4th SS meeting, DGM (SO-I), NERLDC informed that after tripping of 400 kV Silchar – Palatana I & II lines on 23.02.2015, SPS – II did not operate as planned for load relief.

Further, NERLDC has requested to trip 400/132 kV, 125 MVA ICT at Palatana immediately after tripping of 400 kV Palatana – Silchar I & II lines for safe, secure and reliable operation of Tripura system.

After detailed deliberation, the Sub-committee requested OTPC to implement the SPS-II as per system requirement. The Sub-committee also requested OTPC to enhance capacity of station transformer for adequate supply of auxiliary power to the modules at the earliest. Further, the SPS-II would be reviewed again, once the plant is generating full capacity.

OTPC agreed to implement the SPS-II, but stated that installation of adequate ICT may take some time.

OTPC may kindly intimate the current status.

SPS III (implemented w.e.f 23.02.15):

In case of tripping of 400 kV Silchar - Byrnihat & 400 kV Silchar - Azara lines (with Module I generation of Palatana, OTPC), Generation of Palatana, OTPC will be reduced to around 200 MW.

During meeting, NERLDC informed that SPS III was not operated after tripping of 400 kV Silchar – Byrnihat line & 400 kV Silchar – Azara line on 21.04.15. The matter is very serious. It is suspected that SPS III is not yet implemented by OTPC.

OTPC informed that the scheme has already been implemented.

Members may kindly note.

SPS IV (implemented w.e.f 14.09.13):

In case of tripping of 400 kV Silchar – Byrnihat & 400 kV Silchar- Azra lines (without generation of Palatana, OTPC), load will disconnected by tripping of the following elements:

132 kV Silchar - Srikona D/C
132 kV Silchar - Panchgram
132 kV Badarpur - Panchgram
132 kV Silchar – Dullavcherra - Dharmanagar

OTPC & POWERGRID informed that above scheme has already been implemented by them.

The Sub-committee noted as above.

2. SPS based load disconnection in case of overloading of 220 kV Salakati – BTPS I & II lines:

In case of tripping of 400 kV Bongaigaon – Azara & 400 kV Bongaigaon –Byrnihat lines, **220 kV Salakati – BTPS I & II lines** may be overloaded and tripped at peak hours. In case of overloading of these lines, Capital area, Dhaligaon area of Assam & Nangalbibra area of Meghalaya & North Bengal & Bhutan system may be collapsed.

To safe, secure & reliable operation of these areas of NER, SPS is to be designed for load disconnection in these areas **in case of overloading of 220 kV Salakati – BTPS I & II lines when both lines are in service & in case of overloading of 220 kV Salakati – BTPS line when one line is in service**.

Assam stated that Dhaligaon load needs to be kept in radial mode and Bhutan load through 132 kV Rangia – Deothang S/C must not be affected.

During the 4th SS meeting, Assam agreed to above scheme as suggested and the same would be implemented by 15.05.2015.

Assam may kindly intimate the current status.

3. SPS based generation reduction of AGTPP in case of tripping of 132 kV AGTPP – Kumarghat line

It has been observed from study results that after commissioning of Palatana 2nd Module, Monarchak Unit I & II and AGTPP Unit 5 & 6, 132 kV AGTPP – Kumarghat, 132 kV Monarchak – Udaipur, 132 kV Baramura – Teliamura & 132 kV Teliamura-Ambassa lines will be highly loaded.

In case of tripping of 132 kV AGTPP - Kumarghat line, following lines will be overloaded:-

1. 132 kV Monarchak - Udaipur : 72 MW
2. 132 kV Dhalabil - Agartala : 84 MW
3. 132 kV Dhalabil - Kamalpur : 79 MW
4. 132 kV Baramura - Teliamura : 88 MW
5. 132 kV Teliamura - Ambassa : 86 MW
6. 132 kV PK Bari - Kumarghat : 92 MW
7. 132 kV PK Bari - Ambassa : 81 MW
8. 132 kV PK Bari - Kamalpur : 76 MW

During 4th SS meeting, NEEPCO agreed to implement the SPS within April, 2015.

NEEPCO may kindly intimate the current status

4. SPS at Silchar.

During meeting held on 06.04.2015, DGM (SO-II), NERLDC informed that Silchar is very important station in Southern Assam part of NER Grid and after termination of 132 kV Silchar – Imphal (PG) D/C lines, loading of 2x200 MVA, 400/132 kV Silchar ICTs has increased and persistent violation of N-1 condition was observed during peak hours. In case of overloading & tripping of any ICTs at Silchar during peak hours, there may be cascade tripping of transmission elements of this part of NER and grid disturbance may occur in this part of NER. As more 132 kV lines from 132 kV Silchar (PG) substation are expected to connect load centers in Tripura, Mizoram, the loading of Silchar ICTs are expected to increase further.

He suggested to have one more SPS at Silchar and that the current SPS based load shedding associated with SPS related to Palatana unit tripping may be extended to Silchar substation such that load is disconnected automatically in case of tripping of any ICT at Silchar.

The Sub-committee requested NERLDC to carry out the system study and so that the proposed SPS at Silchar can be discussed further.

During 4th SS meeting, DGM (AM), NERTS informed that above scheme would be implemented within May, 2015.

NERTS may kindly intimate the current status

5. SPS requirement of States

NER states may review the critical loading within their system and the vulnerability of important load centers[if any] and propose SPS scheme so that the same can be implemented in a coordinated manner under the aegis of NERPC to ensure power supply to important load centers during contingencies and also integrity NER grid is maintained.

During meeting held on 06.04.2015, DGM (SO-I) briefed about the importance of SPS in respect of each state for review the critical loading within their system and the vulnerability of important load centers[if any] and therefore requested constituents to look into the matter for the benefit of the system in NER.

During 4th SS meeting, EE, Me.ECL informed that one SPS has been implemented by them on 132 kV Killing to EPIP – II will be implemented by May, 2015.

The Sub-committee appreciated Meghalaya and requested other states to plan for implementation of SPS accordingly.

Meghalaya & constituents may kindly intimate the current status

6. Installation of Reactor at Rangandai HEP.

DGM (SO-II) informed that on several occasions NER grid experiencing very high voltage condition during off-peak hours resulting in opening of numbers of 400 kV circuits to contain over voltage especially at RHEP. 400 kV Balipara- RHEP D/C link is operated thro' single circuit only in most of the time sacrificing reliability of the system. Similar is the condition in other corridors including IR link. To address the problem, conversion of line reactors as Bus reactors for 400 kV Bongaigaon-Balipara D/C line and installation of additional bus reactors at Balipara have been proposed [please see SL no C.12 above].

In addition to this, one bus reactor of at least 50 MVAR capacity is required to installed at RHEP so that over voltage problem can be solved

SE(O) informed that issue regarding installation of reactor at Ranganadi, and NERPC has already wrote to NEEPCO to furnish the information below to counter the high voltage problem at Ranganadi end.

1. Possibility of installation of Bus Reactor either at 400 kV or 132 kV RHEP Switchyards
2. Possibility of running of machine in synchronous condenser mode during lean hydro
3. Possibility of installation of Tertiary reactors if Tertiary winding is available in ICTs at RHEP.

During 4th SS meeting, It was decided that 50 MVAR Line Reactor of 400 kV Balipara – Ranganadi line is to be taken into Bus Reactor when the line was kept open as high voltage is observing at their end.

The Sub-committee requested NERPC to write a letter to management of NEEPCO for taking 50 MVAR Line Reactor of 400 kV Balipara – Ranganadi line as Bus Reactor whenever required.

Accordingly, NERPC vide letter dated 11.05.2015 has written to NEEPCO to carry out the work as decided by the Sub-committee.

NEEPCO/NERPC may kindly intimate the status

7. 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 Mokukchung – 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	**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)]**	132 kV Palatana – Udaipur 132 kV Palatana – Surjamani Nagar	UFR-1 [At Palatana]	**OTPC**
		132 kV Silchar – Dullavcherra	UFR-2 [At Silchar]	**PGCIL**
		132 kV AGTPP – Kumarghat 132 kV P K Bari – Kumarghat	UFR-3 [At Kumarghat]	**PGCIL**
3	**ISLAND AT 47.90 Hz:** 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		

NERLDC informed that Islanding –I tripped during Grid Disturbance occurred on 23.02.2015, they enquired associated lines pertaining to Islanding –II tripped. Moreover, constituents are requested if any UFRs operated during the above incidence.

DGM (AM), NERTS informed that on that particular day i.e. 23.02.2015, the 132 kV Silchar-Dullavcherra line was in open condition and the other lines i.e. 132 kV R.C. Nagar – Dullavcherra and 132 kV P.K. Bari line tripped on UFRs. Moreover, he requested NERLDC to check the event through PMU if frequency touches 48.50 Hz and also the duration. He suggested to reset the frequency setting from 48.5 Hz to 48.8 Hz. and the committee agreed to the same.

The committee agreed the proposal and the status will be discussed again in next PCC/OCC to review the scheme.

After detailed deliberation, the 4th SS Sub-committee decided to set both the Islanding Scheme I & II at 48.80 Hz. Necessary action has to be carried out by concerned utilities at the earliest.

Concerned Utility may kindly intimate the current status.