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POSOCO/NGP/

Dated: 19<sup>th</sup> November 2010

To,

As per distribution list enclosed

**Sub: Prioritization of elements for removal of congestion based on criticality and frequency of congestion**

- Ref: 1. CERC order dated 8.11.2010 in petition no. 67/2010**  
**2. Operational feedback on transmission constraints dtd. 5.4.10**  
**3. Proposal for Static VAR Compensation (SVC) in SR and NR dtd. 24.6.10**  
**4. Operational feedback on Need for increasing the transfer capability towards Southern Region dtd. 29.10.10**

Sir,

Hon'ble CERC vide order dated 08.11.2010 in petition 67/2010 has directed as under:

"We accordingly direct the National Load Despatch Centre to prioritise the elements for removal of congestion based on the criticality and frequency of congestion and provide these details to the Central Transmission Utility and the concerned State Utilities under intimation to the Commission by 20.11.2010. Central Transmission Utility is directed to submit to the Commission the timeline for removal of the congestion points by 30.11.2010. Similarly the State Utilities in Haryana, Jammu & Kashmir, Punjab, Uttarakhand, Uttar Pradesh, Chhattisgarh, Madhya Pradesh, Maharashtra, Andhra Pradesh, Karnataka, Kerala, Tamil Nadu Bihar, Jharkhand, Orissa, Assam and Manipur and Damodar Valley Corporation (DVC), for which National Load Despatch Centre has indicated remedial measures to be taken, are directed to file their reply by 30.11.2010 after serving copy thereof on National Load Despatch Centre and Central Transmission Utility."

Periodic operational feedback had been given by NLDC to CTU and CEA as per its statutory responsibility vide letters referred above (Copies enclosed). Congestion experienced is seasonal in nature e.g. in winter congestion is experienced towards Southern Region, whereas in monsoon, congestion is primarily towards Northern Region. When network is strengthened in one corridor to remove congestion, congestion appears in another corridor, downstream or upstream. In order to comprehensively address the issue, all the constraints are to be resolved simultaneously and it is difficult to prioritize. Even after all these schemes are commissioned, congestion may reappear due to changes in load and generation disposition.

However, as directed by the Hon'ble Commission, region-wise priority to address congestion is given below:

Southern Region:

1. 400 kV Vijayawada-Nellore-Almathi D/C and North-South Corridors: Due to good generation in Vemagiri area and delay in commissioning of generation projects in Tamil Nadu, this corridor remains heavily loaded. Loading of 400 kV Gooty-Hoody and Gooty-Neelamangala line also remains high. A parallel path needs to be developed on urgent basis.
2. S1-S2 Bid area constraints: High loading of 400 kV Bangalore-Salem, Hosur-Salem sections and low voltage at Sriperumbudur leads to congestion between S1 bid area (comprising of Andhra Pradesh and Karnataka) and S2 bid area (comprising of Tamil Nadu, Kerala and

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Puduchery). In order to address this constraint, Bangalore-Salem and Hosur-Salem sections need to be strengthened, planned 400 kV Mysore-Kozhikode-North Trichur-Cochin link needs to be expedited and suitable reactive compensation may be planned near Chennai area.

3. Srisaillam Evacuation: During high generation at Srisaillam, loading of 400 kV Srisaillam-Kurnool and Kurnool-Gooty lines remain high, of the order of 700 MW. Krishnapattinam UMPP evacuation lines may be expedited to address this constraint.
4. During high wind generation, loading of 400 kV Neyveli-Pondy-Sriperumbudur S/C remains high. The situation may aggravate with more wind generation coming in, commissioning of Kudankulam (2x1000 MW nuclear power plant) and Neyveli expansion projects. The 400 kV Neyveli-Pondy-Sriperumbudur section needs to be strengthened.
5. Transmission Constraints and low voltage in Chennai City: TNEB may address the problem by augmenting transmission / sub-transmission system in and around Chennai and installation of capacitors.
6. Evacuation of Udupi Power (NCL) and Varahi: These generating stations are facing evacuation constraints. KPTCL may take necessary action for augmenting the transmission system.

In order to enhance transfer capability towards Southern Region, which is limited by capacity of HVDC links at present, synchronous operation of Southern Region with rest of the country may be explored by advancing commissioning of planned high capacity corridors.

#### Northern Region

1. Low voltage in Central / Western part: Capacitors need to be installed in states in Central and Western part of the grid (i.e. Delhi, Punjab, Haryana, UP (West), Rajasthan and J&K) to address low voltage problem. There is large gap in requirement as computed by NRPC vis-a-vis actual installation of the capacitor banks in different state control areas.
2. Network constraint in Western UP: Inadequacy in 220 kV transmission system and 400/220 kV transformation capacity in Western Uttar Pradesh system need to be addressed. (details given in the letter dated 5.4.2010)
3. Import capability of Northern Region gets limited by due to transmission constraints in Western and Northern Regions. These constraints are discussed in respective sections (i.e. WR and ER)

#### Western Region

1. Constraints in export to Northern Region: During monsoon, import by Northern Region remains high. This leads to high loading of 400 kV Soja-Zerda S/C, 220 kV Badod-Kota S/C and 220 kV Badod-Modak S/C lines. Commissioning of 400kV Ranchodpura-Zerda (schedule-Dec'10) will provide a parallel path to 400kV Soja-Zerda and help in relieving high loading. LILO of 400kV Bina-Nagda at Shujalpur (POWERGRID) (schedule-Feb'11) and Shujalpur-RAPP (proposed) will help in relieving the loading of 220kV Badod-Kota and Badod-Modak
2. High generation / low demand in Gujarat coupled with high demand / low generation in Maharashtra leads to high loading of 400 kV Sugan-Vapi line. 400 kV Gandhar-Navsari D/C line and 400 kV Navsari-Mumbai D/C line need to be expedited. With the commissioning of Mundra UMPP and around 10000 MW generation projects in Gujarat by 2012, any skewed profile of load/generation will lead to loading on the 400kV Gujarat-Maharashtra section even after the above circuits are commissioned. The Gujarat to Maharashtra section therefore needs further augmentation.
3. 400 kV Raipur-Bhadravati T/C and 400 kV Bhilai-Bhadravati S/C: Low generation at Chandrapur coupled with transfer of about 800-900 MW to SR through Bhadravati HVDC

- leads to high loading on this section. 400 kV Raipur-Wardha D/C and 400 kV Wardha-Parli D/C are under construction and will provide a parallel corridor.
4. 400 kV Bhilai-Koradi S/C and 400 kV Bhilai-Seoni S/C: High generation in Chhattisgarh (including IPPs) leads to high loading of these lines. The situation is likely to get aggravated further with one more unit of 500 MW expected to be commissioned at Korba and generation addition in Eastern Region. 400kV Korba-Birsinghpur D/C (schedule-Dec'10) will partially relieve the loading on 400 kV Bhilai-Seoni. 400kV Raipur-Wardha-Parli D/C will relieve the loading on 400kV Bhilai-Koradi. These lines may be expedited.
  5. ICT loadings at 400kV Padghe and Kalwa sub-stations of MSETCL: The 400/220 kV transformation capacity is proving to be one of the constraints in feeding the Mumbai metropolis and the surrounding areas. Overloading of 400/220kV Padghe ICTs (3x315 MVA) leads to a constraint on increasing flow on Chandrapur-Phadge HVDC bipole. This results in overloading of 400kV Bhilai-Koradi and 400 kV Sugun-Vapi lines. Additional ICT at Kalwa (MSETCL) and 400/220 kV Navi Mumbai Sub-station of POWERGRID may be expedited.

#### Eastern Region

1. Constraints in export to Northern Region: During winter, loading of 400 kV Farakka-Malda D/C limits transfer capability towards NR from ER. During monsoon, high hydro availability in North-Eastern Region, Bhutan and Northern part of Eastern Region leads to high loading of 400 kV Purnea-Muzaffarpur D/C (Quad) line. Loading of 400 kV Farakka-Kahalgaon D/C remains high during monsoon as well as winter. Another 400 kV D/C line from Farakka to Kahalgaon is under construction, which may be expedited. An alternate 400 kV D/C link from South Bengal to North Bengal/ Bihar has been planned and the same may be expedited. The planned 400 kV D/C line from Purnea to Biharshariff would help relieve loading of 400 kV Purnea-Muzaffarpur to some extent.
2. 400 kV Talcher-Rourkela D/C and 400 kV Rengali-Baripada-Kolaghat: During monsoon, high generation in Orissa and import from Southern Region leads to high loading of this section. A new 400 kV D/C line from Talcher to Rourkela has been planned and the same may be expedited.
3. Non-availability of Purnea-Malda D/C line: Circuit-I of this line is under breakdown since 24.7.2009. Circuit-II had been restored on ERS after last monsoon, however the line has again gone under breakdown w.e.f. 7.7.2010. This line is a vital alternate link between northern part of Eastern Region, Bhutan and NER with rest of the grid and restoration of the line on normal tower may be expedited.
4. 220 kV Budhipadar-Tarkera D/C: With high generation availability around Budhipadar area, this line remains heavily loaded. LILO of one circuit of 400 kV Rourkela-Raigarh line at Sterlite has been planned and the same is expected to relieve loading of Budhipadar-Tarkera line.

#### North-Eastern Region

1. 132 kV Kopili-Khandong S/C line: This line is extremely critical for the 132 kV pocket of NER grid. The proposed 2nd circuit under missing link project may be expedited.
2. 400/220 kV, 315 MVA ICT at Misa: At present only one 400/220 kV, 315 MVA ICT is available at Misa Sub-Station. Outage of this element results in serious evacuation / reliability problems in major part of NER grid. The planned second ICT would help in relieving this constraint.
3. 132 kV Dimapur-Imphal S/C line: This line is vital for power supply to the state of Manipur as well as security of 132 kV pocket of NER grid. Capacity of this line is inadequate. 400 kV Silchar-Imphal D/C line (charged at 132 kV) and new sub-station at Imphal proposed in the system strengthening scheme of NER would address the constraint.

4. Overloading of lines during peak hours: 132 kV Badarpur-Khlieriat S/C line is vital for power supply to the state of Tripura, Mizoram and South Assam as well as security of 132 kV pocket of NER grid. The 132 kV Badarpur-Khlieriat S/C, 132 kV Khandong-Khlieriat D/C and 132 kV Imphal-Imphal S/C lines get frequently overloaded in peak hours. 400 kV Silchar sub-station and associated lines proposed in the system strengthening scheme of NER would address the constraint.
5. 132 kV Badarpur-Kumarghat S/C & Kumarghat-Aizawl S/C lines: Tripping of any one of these lines result in evacuation constraints for R.C.Nagar generation. 400 kV Silchar sub-station and associated lines proposed in the system strengthening scheme of NER would address the constraint.
6. 220 kV BTPS-Agia-Sarusajai D/C line (Assam): Only one circuit of this corridor is in service. ASEB may expedite restoration of the other circuit.
7. 132 kV Umium Stage-I – Mawlai S/C line (Meghalaya): Frequent over-loading takes place in peak hours and the corridor needs strengthening.
8. 132 kV Loktak-Jiribam line-I (Manipur): This line is under outage since the year 2002, and overloading of parallel circuit of CTU is very common. The line may be restored on priority.
9. 220/132 kV, 100 MVA ICT at Dimapur: This ICT gets overloaded in peak hours. Installation of second ICT at Dimapur (under Missing Link Project) would address this constraint.
10. 132 KV Dimapur-Dimapur S/C line (Nagaland): Frequent overloading of this line takes place during peak hours. LILO of Dimapur-Kohima line proposed in the missing link project would address the constraint.

The above priority list of network elements for containing the congestion is not exhaustive and is based on the bigger picture of the country at Regional / National level. However network shortcomings in the state systems might also cause congestion in some areas which needs to be identified by STU/SLDC and the same are also to be addressed.

Thanking You,

Yours Faithfully

19/11/10  
(V.V.Sharma)

General Manager, NLDC

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