

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No.: 167/Suo Motu/2012

Coram:

**Dr. Pramod Deo, Chairperson
Shri S. Jayaraman, Member
Shri V.S.Verma, Member
Shri M. Deena Dayalan, Member**

Date of Order: 16.11.2012

In the matter of:

Grid Disturbance on 30.7.2012 and 31.7.2012

And

In the matter of:

1. National Load Despatch Centre, New Delhi
2. Northern Regional Load Despatch Centre, New Delhi
3. Western Regional Load Despatch Centre, Mumbai
4. Eastern Regional Load Despatch Centre, Kolkata
5. North Eastern Load Despatch Centre, Shillong
6. Northern Regional Power Committee, New Delhi
7. Western Regional Power Committee, Mumbai
8. Eastern Regional Power Committee, Kolkata
9. North Eastern Regional Power Committee, Shillong
10. Power Grid Corporation of India Limited, Gurgaon
11. NTPC Ltd, New Delhi
12. Central Electricity Authority, New Delhi

Respondents

ORDER

The Northern Regional Grid failed on 30.7.2012 at about 2:30 hrs and the Northern, Eastern and Northern-Eastern grids failed at about 1300 hrs on 31.7.2012. The grid failures plunged several states into darkness and to fend without electricity for hours together and affected the communication, essential services, industry, economy and the life of the people in a large way. In view of the magnitude and severity of the grid disturbance, the

Commission directed the CEO, Power System Operation Corporation Limited (POSOCO) and CMD, Central Transmission Utility (CTU) to investigate into grid failures and submit a report to the Commission. After carrying out a joint detailed investigation by POSOCO and CTU, CEO POSOCO has since submitted the report. A copy of the report is available on the website of the Commission www.cercind.gov.in and can be downloaded.

2. The staff of the Commission have examined the report of the Enquiry Committee and the report submitted to the Commission by POSOCO. On the basis of the findings in the report, the contributing factors for the grid failures on 30.7.2012 and 31.7.2012 appear to be the following:

(a) The grid disturbance on 30.7.2012 appears to have been triggered due to tripping of 400KV Bina – Gwalior transmission line within the Western Region, through which power to the extent of about 1450 MVA was flowing towards the Northern Region. There was no fault on this line and the tripping occurred on Zone-3 protection on load encroachment which indicates high power flow at reduced voltage. It appears that the relay either needs to be checked for false tripping, if any, or its settings of Zone 3 Protection needs to be reviewed. The protection coordination, which is the responsibility of the RPC, as per the Grid Code, needs to be re-looked at.

(b) Zerda - Kankroli 400 KV S/C line was shut down on 29.7.2012 to take out a Tools and Plant item, which inadvertently was stuck in the polymer insulator. Though the transmission corridor between Western Region and Northern Region was in a depleted state on 29.7.2012, the Total Transfer Capability

(TTC) was shown by WRLDC as 2000 MW. The actual flow of power from Western Region to Northern Region varied from 2200 to 2700 MW as per the messages issued by WRLDC from 21:30 hours of 29.7.2012 to 01:30 hours of 30.7.2012 and the actual power flow was 2044 MW at 0230 hrs on 30.7.2012.

(c) It is noticed that the WRLDC has sent a number of messages to the constituents of Western Region from 21:30 hours of 29.7.2012 onwards right up to 01:30 hours of 30.7.2012, at frequencies ranging from 49.65 Hz to 50.2 Hz to reduce the under-drawal as there was a TTC violation from Western Region to Northern Region and from Western Region to Eastern Region. Messages have also gone from WRLDC to NTPC at 23:45 hours on 29.7.2012 requesting for reduction of generation from Sipat Unit #3. NTPC appear to have responded by stating that Unit #3 was running under trial operation at technical minimum and hence further load reduction was not possible.

(d) Messages have gone from NLDC to NRLDC to ask constituents of Northern Region to reduce the load. Messages have also gone from NRLDC to the constituents of Northern Region, specifically bringing to their notice that the inter-regional line Gwalior-Agra-I was getting loaded to 975 MW, which was critical. However, it appears that there was inadequate response to these messages. However, the net over-drawal by constituents of Northern Region was only about 500 MW at 2.30 hrs. of 30.7.2012. So, it is not known whether there were any short-term contracts for sale of power from entities of Western

Region to entities of the Northern Region which contributed to the high flow on the WR-NR corridor. This aspect needs to be ascertained.

(e) After shut down of Zerda-Kankroli 400 KV line, action should have been taken to reduce the Total Transfer Capability (TTC), which is not observed, as per the records of messages. The TTC is shown as 2000 MW before and after the shutdown of the Zerda-Kankroli 400 KV line. Also, notice for application of congestion charge should have been given by WRLDC for the Bina-Gwalior 400 kV line and by NLDC for the WR-NR corridor and congestion charge should have been applied as per the regulations. No such notice appears to have been given or congestion charge has been applied.

(f) After tripping of Bina–Gwalior 400 kV line, the power flow, which was going from Western Region to Northern Region on this line, and thereon through the Gwalior-Agra line, got diverted to a longer path i.e. to Northern Region through the Eastern Region. Consequently, most of the lines tripped on power swing indications.

(g) The tripping on 31.7.2012 at 13.00 hrs. was triggered in the same way. However, during that time, a critical line, viz. one circuit of the D/C 400 kV Rourkela-Jamshedpur line in the Eastern Region was out of service due to a burst lightning arrester. This line is in series with the Raigarh-Rourkela 400 kV two Double Circuit inter-Regional lines between WR and ER. Therefore the WR-ER network was also in a depleted state. In the second disturbance, the

Eastern Region and along with it, the North-Eastern Regional Grid suffered a blackout.

3. In view of the above findings in the report submitted by POSOCO, the Commission is prima facie of the view that relevant regulations of the Commission namely, Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 as amended from time to time and Central Electricity Regulatory Commission (Measures to relieve congestion in real time operation) Regulations, 2009 have not been strictly complied with by various agencies. Accordingly we direct Respondent Nos. 1 to 11 to submit their responses by 23.11.2012 to the findings in the report on the grid failures on 30.7.2012 and 31.7.2012, -with particular reference to their failure to take necessary actions which were expected of them as per the regulations of the Commission.

4. We intend to hear the respondents on their views on the factors which precipitated the grid failures and the remedial measures which need to be taken to obviate recurrence of such instances in future. We direct that the representative of CEA shall be present during the hearing to assist the Commission.

5. The petition shall be heard on 27.11.2012.

sd/-
(M. Deena Dayalan)
Member

sd/-
(V. S. Verma)
Member

sd/-
(S. Jayaraman)
Member

sd/-
(Dr. Pramod Deo)
Chairperson