

## Eastern Regional Power Committee

### MINUTES OF 59<sup>TH</sup> OCC MEETING HELD ON 22.02.11 AT ERPC, KOLKATA

List of participants is at Annexure-A.

Sh. A. K. Rampal, Member Secretary, ERPC welcomed all the participants to this 59<sup>th</sup> OCC meeting. He mentioned about the disruption of rail movement at Talcher area affecting receipt of coal by Talcher from mines. This had resulted into severe coal shortage and shutting down of all Talcher units except U#4 on 22.02.11. In order to have better maintenance planning and system operation of Talcher Stage-I and Stage-II, he proposed that whenever one unit of either stage-I and Stage-II is under planned maintenance/out due to shortage of coal, 1/3<sup>rd</sup> of that unit capacity from ER and 2/3<sup>rd</sup> of that unit capacity from SR may be deemed as under maintenance. He requested NTPC to explore the above proposal. He then requested Sh. A. K. Bandyopadhyaya, Superintending Engineer (O), ERPC to take the agenda items.

Then the agenda was taken up by Sh. A. K. Bandyopadhyaya.

#### PART A : CONFIRMATION OF MEETING AND PRESENTATION

##### ITEM NO. A.1: CONFIRMATION OF MINUTES OF 58<sup>TH</sup> OCC MEETING OF ERPC HELD ON 19.01.11

The minutes were circulated vide letter dated 01.02.11 to all the constituents. Since then, no comment was received.

Members may confirm.

##### Deliberation in the meeting

Members confirmed.

#### PART B: FOLLOW-UP OF DECISIONS OF EARLIER OCC MEETING(S)

##### ITEM NO. B.1: MOCK BLACKSTART EXERCISES IN EASTERN REGION (Item no. B.1 of MOM of 58<sup>th</sup> OCC meeting)

##### a) Rengali & Indravati HEP

It was decided that mock black start for Rengali would be taken up on 25<sup>th</sup> January 2011 and that of Indravati HEP would be taken up in February 2011. However, the same are yet to be carried out.

It was also decided that mock start for Balimela and Upper Kolab HEP would be taken after the same for Rengali and Indravati is over

OHPC/ERLDC may update the status.

### **Deliberation in the meeting**

*OPTCL informed that planned mock exercise could not be taken up due to unforeseen reasons. However, OPTCL indicated that they intend to take up the mock exercise of Rengali and Indravati HEP by 1<sup>st</sup> week of March 2011. Members dismayed at the slow progress and advised OPTCL/OHPC to take up the exercise before ensuing TCC/ERPC.*

### **b) Mock drill exercise for ER by utilizing HVDC Gazuwaka**

It was decided that the above mock drill exercise would be carried out after mock exercise of Rengali and Indravati HEP. Meanwhile, constituents, specially OPTCL and PGCIL were requested to submit their comments on the scheme circulated by ERLDC. However, ERLDC is yet to receive any comments.

OPTCL and PGCIL may submit their comments, if any.

### **Deliberation in the meeting**

*OPTCL and PGCIL did not offer any comments. Members finalized the scheme prepared by ERLDC for the above mock drill exercise and requested ERLDC to proceed further.*

### **c) Test run report of the existing DG sets meant for black start**

For the month of January 2011, only Teesta HEP has submitted test run report of existing DG sets meant for black start. Subarnarekha (JSEB), Indravati (OHPC) and WBSEDCL hydro stations, Rangit HEP (NHPC) are yet to submit the same.

In line with decisions taken in 56<sup>th</sup> OCC, DG sets of the above mentioned generating stations, which have not yet submitted the reports, would be taken as healthy and the onus of healthiness of the DG sets would be with the utilities.

Members may note.

### **Deliberation in the meeting**

*Since then, WBSEDCL and Rangit HEP (NHPC) submitted test run reports of DG sets for the month of January 2011.*

*Subarnarekha (JSEB) and Indravati (OHPC) did not submit any report. However, concerned members assured healthiness of DG sets.*

### **d) Updated black start and restoration procedure --ERLDC**

The Black start and restoration procedure for ER System has been reviewed and updated. The soft copy of the procedure will be circulated to all the members for their comments.

Members may note and send their comments.

### Deliberation in the meeting

*ERLDC circulated the updated black start and restoration procedure. Constituents were requested to submit their comments before next OCC.*

#### **ITEM NO. B.2: PARALLEL OPERATION OF TWO BUSES AT MUZAFFARPUR SUBSTATION**

(Item no. C.4 of MOM of 58<sup>th</sup> OCC meeting)

It was understood that two buses at Muzzafarpur substation were operating as separate buses and not operating in parallel thus limiting the redundancy of the system. This also has a bearing on shutdown of 220 kV Muzzafarpur(PG)-Muzzafarpur(BSEB) D/c lines as one unit each of MTPS (KBUNL) is running separately on two separate buses and shutdown of any line will lead to shutdown of one unit.

No discussions were held in the meeting as KBUNL representative did not participate in the meeting. Subsequently, ERPC vide its FAX message dated 14.02.11 requested KBUNL to participate and share their view in the OCC meeting.

KBUNL may share the constraints in their network and remedial measures being undertaken by them.

### Deliberation in the meeting

*KBUNL representative was not present. However, in a letter written to ERLDC, KBUNL informed that they had taken action for restoration of 220 kV and 132 kV breakers. The jobs was awarded to BHEL and expected to be completed by October 2011.*

#### **ITEM NO. B.3: FREQUENT TRIPPING OF 132 KV KAHALGAON-LALMATIA AND 132 KV KAHALGAON-SABOUR LINES-NTPC**

(Item no. C.6 of MOM of 58<sup>th</sup> OCC meeting)

In order to avoid future recurrence of the incident, it was decided that joint testing of relays, circuit breakers and protection equipment/schemes would be carried out at Lalmatia substation on 28<sup>th</sup> January 2011 by NTPC and JSEB and the report of the joint testing would be sent by both JSEB and NTPC to ERPC Secretariat by 1<sup>st</sup> February 2011.

However, joint testing report is yet to be received by ERPC.

JSEB and NTPC may share the status.

### Deliberation in the meeting

*JSEB & NTPC confirmed that joint testing has since been carried out by them at Lalmatia s/s on 01.02.11. Accordingly, JSEB initiated remedial actions, which are showing satisfactory preliminary results.*

*However, there were some protection co-ordination issue and OCC referred*

*them to Protection sub-Committee meeting.*

**ITEM NO. B.4: SEPARATE METERING FOR KAHALGAON STPS STAGE-I AND STAGE-II**  
(Item no. C.7 of MOM of 58<sup>th</sup> OCC meeting)

The issue was deliberated in the 16<sup>th</sup> TCC meeting of ERPC held on 17.12.10. In line with decisions taken in the TCC meeting, 58<sup>th</sup> OCC decided that a separate meeting would be held with NTPC, ERLDC and ERPC tentatively on 25.01.11 to finalize the scheme for separate metering.

Accordingly, a joint meeting was held on 25.01.11 with NTPC, ERLDC and ERPC and it was decided that stage wise actual generation (AG) of Kahalgaon STPS would be computed as below:

AGStage I= (GT1+GT2+GT3+GT4)\* (Sum of all outgoing feeders)/(GT1+GT2+..GT7)

AGStage II= (GT5+GT6+GT7)\* (Sum of all outgoing feeders)/(GT1+GT2+..GT7)

In case of failure of any of the GT meter, ST meter reading of HV side can be used for apportionment of stage wise actual generation.

Members may discuss and give their concurrence to the proposal.

**Deliberation in the meeting**

*Member Secretary, ERPC pointed out that in the proposal, auxiliary consumption of Stage-I and Stage-II will be shared on pro-rata basis. He emphasized that as these two stages are separate stations, provision for separate bus/metering should have been taken care during planning stage. NTPC stated that all multiple stage stations of NTPC except Talcher have common bus facility. In this regard, ERLDC recollected the need for separate metering for two stages keeping in view of recent UI regulation.*

*After deliberation, OCC approved the proposal of NTPC as an interim measures. NTPC shall explore the long term arrangement for accurate measurement of station wise generation.*

*OCC referred this issue to Commercial sub-Committee.*

**ITEM NO. B.5: SCHEDULING OF STERLITE ENERGY LIMITED (SEL)**  
(Item no. C.8 of MOM of 58<sup>th</sup> OCC meeting)

The issue of scheduling of M/s. Sterlite Energy Ltd. (4x600 MW) was placed in the 58<sup>th</sup> OCC meeting. It was decided that a separate meeting would be held with Sterlite, ERLDC and ERPC on 21.01.11 to discuss the issue.

Accordingly, a meeting was held on 23.01.11 at ERPC Secretariat, Kolkata. After preliminary discussion, it was felt to hold meeting with OPTCL, GRIDCO, SEL, ERLDC and ERPC Secretariat in two phases:

- In the first phase, designation of appropriated Load Despatch Centres for SEL control area in the light of PPAs, agreement signed by SEL with counterparts will be discussed.
- To be followed by another meeting, to decide upon coordination of

relays for integrating system with STU/CTU as the case may be.

The meeting is proposed to be held on 14<sup>th</sup> February 2011. OPTCL/GRIDCO may update the latest development.

**Deliberation in the meeting**

*Members decided to drop the agenda for the time being.*

**ITEM NO. B.6: OPERATING PROCEDURE OF EASTERN REGION**  
(Item no. C.9 of MOM of 58<sup>th</sup> OCC meeting)

In view of changed regulation and addition of no of Grid element, ERLDC updated and finalized operating procedure of Eastern Region. A copy of the same was circulated in the meeting for comments of the member. It was decided that constituents would submit their observations to ERLDC before next OCC meeting. ERLDC informed that they are yet to receive any comments.

Members may share their positions in this regard.

**Deliberation in the meeting**

*Constituents were requested to offer their comments to ERLDC latest by 1<sup>st</sup> March 2011. In case no comment is received by ERLDC, draft Operating Procedure would be considered as final.*

**ITEM NO. B.7: FEEDBACK ON SHUTDOWN APPROVED FOR THE MONTH OF JANUARY'11**

(Item no. D.3 of MOM of 58<sup>th</sup> OCC meeting)

**a) Shutdown of Talcher-Kolar HVDC bipoles to be taken by PGCIL (SR)**

In the last meeting, OCC decided that Member Secretary, SRPC may be apprised about the critical grid condition of ER and be requested to either prepone or postpone (except on 26<sup>th</sup> January'11) the HVDC bipole outage originally scheduled on 23<sup>rd</sup> January 2011.

Accordingly, MS, SRPC was communicated the views of OCC of ERPC vide ERPC letter dated 20.01.11. Shutdown of Talcher - Kolar HVDC poles was availed as under:

| Date       | Shut down                    |
|------------|------------------------------|
| 22.01.2011 | Talcher - Kolar HVDC Pole I  |
| 23.01.2011 | Talcher - Kolar HVDC Bi-pole |
| 24.01.2011 | Talcher - Kolar HVDC Pole II |
| 25.01.2011 | Talcher - Kolar HVDC Pole I  |

The aforesaid shutdown was undertaken safely. Views of ERLDC and NTPC on shutdown is given in **Annexure-I and Annexure-I(aa) respectively.**

The main features of the shutdown are as follows:

- The Low hydro conditions in Orissa helped absorbing/wheeling Talcher Stage II generation for all of its units.

- Although there was less drawal by WR, the newly commissioned 400kV Rourkela -Ranchi line in parallel to Maithon-Jamshedpur 400kV D/C corridor helped evacuation of power.
- The non-availability of Maithon-DSTPS-Mejia-B 400kV S/C section lead to a reduced redundancy in the system on 22<sup>nd</sup> Jan'11. However , the entire section was made available on 23<sup>rd</sup> January during Double pole shut down.
- The outage /tripping of Talcher-Rourkella ckt 1 on 22<sup>nd</sup> January lead to a severe network contingency when single 400 kV Talcher-Roukella flow touched over 700MW. The outage delayed the double pole shutdown on 23<sup>rd</sup> Jan'11.
- During normalisation of the shutdown from single pole to double pole on 22<sup>nd</sup> January, the system went momentarily under ground return mode. The Interconnector flow touched around 1500MW with Talcher-Rourkella single ckt getting critically loaded beyond 900 MW. A major Grid hazard could be avoided by reduction of generation in Orissa and Talcher STPP and even at Simadri to facilitate higher transfer through Jaypore-Gazuwaka 400kV D/C. Any change over from single to bipole or vice versa should have been undertaken below power order of 1000MW( less than 2000 amps)
- On 23<sup>rd</sup> January, All the four units of Talcher stage II brought down its generation around 800MW . The effort was commendable that facilitated a controlled line flows in ER that facilitated the bipole shutdown with all units of TSTPP on bar.

Members may discuss the issue and draw a framework/guidelines which could be proposed to SR/other regions for availing this type of inter-regional s/d.

#### **Deliberation in the meeting**

*Members noted the observation of ERLDC & NTPC.*

#### **b) Shutdown of other elements**

Approved S/D during the month of January 2011 is placed at **Annexure-I(a)**. Concerned utilities may give their feedbacks in respect of shutdown approved.

#### **Deliberation in the meeting**

*Feedback of the constituents is updated at Annexure-I(a).*

### **PART C : NEW ITEMS**

#### **ITEM NO. C.1: PROCUREMENT OF SPARE TRANSFORMERS BY PGCIL**

ERPC in its last (16<sup>th</sup>) meeting approved procurement of spare transformers for use by states

1. 400/220kV, 2X 315 MVA
2. 220/132kV, 2x 160/150 MVA( as may be available)
3. 132/66 kV, 1x 50 MVA

4. 132/33kV, 1x 50 MVA

It was also decided Powergrid will install them at their sub-stations in Eastern Region and decide by itself their location, and inform OCC of ERPC about their location (s).

Powergrid may intimate the latest status thereof.

**Deliberation in the meeting**

*PGCIL informed that their Board had given investment approval for the above spare transformers and feasibility report is under preparation. Placement of work order would take another 6-8 months. These transformers would be tentatively kept at Biharshariff, Jamshedpur, Malda and Rengali. OCC Members requested PGCIL to expedite the work.*

*Regarding, procurement of 2x315 MVA 400/220 kV spare transformers and 1x50 MVAR spare reactor (for use in ISTS network), PGCIL informed that order is going to be placed shortly.*

*OCC requested PGCIL to update the latest status to ERPC before ensuing TCC/ERPC meeting.*

**ITEM NO. C.2: ALLOCATION OF 500 MW POWER TO JSEB FROM KODERMA TPS OF DVC (2X500 MW)**

In the last (16<sup>th</sup>) ERPC meeting, JSEB informed that only 50 MW power is allocated to JSEB out of 2x500 MW Koderma TPS of DVC, while the bulk of the power is allocated to Delhi and Haryana. JSEB requested to enhance the allocation from 50 MW to 500 MW.

MoP notification dated 27.04.2000 states that CPSU can divert power to other region only if the surplus power remains available with it after due allocation of the beneficiary of the hosting region. Members of TCC/ERPC also raised similar concern in the backdrop of DVC Act. ERPC requested DVC to examine the issue in the light of DVC Act and decided to discuss the issue in the OCC meeting.

Subsequently, DVC was apprised about the decision of ERPC vide FAX message dated 13.01.11 and 11.02.11.

DVC may respond.

**Deliberation in the meeting**

*DVC responded that*

- ✓ *Allocation of power to the beneficiaries from upcoming projects of DVC was finalized in the corporation meeting held on 26.08.2006 and subsequently on 30.04.2007, wherein Govt of Jharkhand and Govt of West Bengal was present.*
- ✓ *In the said meeting, a provision of 900 MW out of 4700 MW capacity addition by DVC planned during XI<sup>th</sup> Plan period was kept for JSEB*
- ✓ *DVC vide its letter dated 16.10.2006, 23.05.2007 and 16.07.2009*

*repeatedly requested JSEB to furnish their phase wise load requirement. However DVC did not receive any reply.*

- ✓ *It is aware that in order to get loan from financial institution, tied up agreement are required. DVC had to execute agreement with other beneficiaries in order to obtain project loan.*
- ✓ *Subsequently, the matter of additional allocation of 450 MW from Koderma was discussed in the meeting held at DVC tower on 24.06.10 with JSEB, wherein it was explained that additional allocation for JSEB can not be made at this stage since agreements have already been tied up. Accordingly, it was decided that JSEB may take up the matter at MOP level for reallocation.*

*TCC/ERPC would be apprised of this matter.*

**ITEM NO. C.3: FORMAT FOR INFORMATION ON COAL USED BY NTPC**

In the last (16<sup>th</sup>) ERPC meeting, the issue of steep hike in price of NTPC power was deliberated. In the meeting, constituents requested for furnishing of supporting documents including pricing of coal for the rise in fuel prices. After deliberation, ERPC decided that this matter would be taken up in next OCC, before which, GRIDCO will send a format for the information sought from NTPC. Subsequently, GRIDCO vide its letter dated 21.01.11 submitted the format (Annexure-II).

Members may discuss.

**Deliberation in the meeting**

*NTPC could not confirm whether they can provide the information on coal in the format given by GRIDCO. NTPC clarified that their commercial/financial wing would be in a position to respond.*

*It was decided to take up this issue in Commercial Sub-Committee meeting (CCM being held on 23.02.11. Member Secretary, ERPC advised NTPC to inform their concerned person to come prepared. NTPC agreed.*

**ITEM NO. C.4: METHODOLOGY FOR COMPUTING FIRM & INFIRM POWER OF FSTPS UNIT#6 --- NTPC**

Unit#6 of FSTPS is likely to be synchronized by the end of February 2011. As there is not bus sectionalizer, so methodology for ESO accounting of new unit and old units of FSTPS requires to be finalized. NTPC proposes the following methodology for accounting firm & infirm power of unit#6 of FSTPS.

| <b>Options</b>                | <b>Formulae for computing ESO</b>   |
|-------------------------------|---|
| U# 6 Infirm<br>U# 1 to 5 Firm | U#6 infirm= (GT6-ST6)<br>U#1 to5 firm= Sum of all outgoing feeders- (GT6-ST6)   |
| U# 6 Firm<br>U# 1 to 5 Firm   | U#6 firm= GT6* Sum of all outgoing feeder/(GT1+GT2+...+GT6)<br>U#1 to 5 firm =(GT1+GT2+...+GT5)* Sum of all outgoing feeder /((GT1+GT2+...+GT6) |

Members may discuss.

### Deliberation in the meeting

*Given the critical coal condition prevailing at Farakka and Kahalgaon STPS and past experience on operation of U#7 of Kahalgaon STPS, Member Secretary, ERPC requested NTPC to clarify whether they have tied up coal arrangement for operation of Farakka U#6. NTPC clarified that they had already tied up coal arrangement for FSTPS U#6.*

*ERLDC requested NTPC to submit Single line Diagram, CT, PT ratio, metering arrangement etc. before synchronization.*

*Regarding metering scheme, OCC felt that the same should be in line with that of Kahalgaon Stage-I and Stage-II and details should be deliberated in CCM.*

*There was a general feeling among the constituent states that the Kahalgaon U#7 experience should not be repeated with Farakka U#6. Therefore, it was decided that prior to synchronization of FSTPS U#6, NTPC should place its coal arrangement before TCC/ERPC.*

### **ITEM NO. C.5: METHODOLOGY FOR ACCOUNTING CONSTRUCTION POWER OF BARH TO BE DRAWN FROM 400 KV KAHALGAON-BARH-PATNA LINE -- - NTPC**

At present Barh is drawing construction power from Barh substation (132/33kV) of BSEB network and accordingly Barh is paying energy charges to BSEB. It is expected that Barh will be able to draw construction power through 400/132 kV ICT from Feb/March 2011. For accounting construction/start up power of a green field project drawn from 400 kV grid, a methodology requires to be fixed. NTPC proposes that SEM reading at 400 kV side of ICT be added in actual drawal of BSEB.

Members may discuss.

### Deliberation in the meeting

*This is an issue between a generating station under construction and licensee of that area. Therefore, NTPC may take it up with BSEB.*

### **ITEM NO. C.6: FREQUENT TRIPPING OF LINES ON OVERVOLTAGE --- ERLDC**

It is observed that number of 400 KV lines are tripping on overvoltage apart from number of 400 KV lines are being kept opened due to overvoltage. Such uncontrolled tripping of important lines is causing depletion of network and increases the probability of grid disturbance. GM (ERLDC) vide letter dated 03.02.2011 has already apprised OCC members on this issue.

Further, number of new generating station namely Barh STPP of NTPC, Mejia-B, DSTPP etc are being connected to the ER grid by LILoing existing line thereby increasing the line length of those line which are being LILoed without being suitably compensated. The same are causing severe high voltage in above said generating station and commissioning activities may get

hampered due to frequent tripping of line thereby losing supply. Also such interruption in the midst of commissioning activities may cause accident and loss of human life.

In view of above, in order to set right the overvoltage problem, following actions need to be taken at the earliest

- i. Relook at existing overvoltage relays with an effort to increase drop off to pick up ratio to 99% to avoid simultaneous tripping of no of line in same station. (Concerned party: PGCIL, NTPC)
- ii. To expedite commissioning of reactors already planned and planning of additional reactors in high voltage prone areas to get approval in standing committee. (Concerned party: DVC, PGCIL)
- iii. Optimization of power order in HVDC, Gazuwaka and Talcher-Kolar HVDC line so that no MVAR from any of the HVDC station is injected to the grid. (Concern Party: PGCIL)
- iv. Testing and declaration of Reactive capability of ISGS at different power level so that generators of the ISGS can be fully exploited to control voltages. (Concerned party: NTPC)

In this regard, NTPC has pointed out that due to continuous high voltage at Barh end (around 440 kV), Barh is unable to charge the station auxiliary transformer.

Members may discuss the ERLDC proposals along with problems of NTPC.

#### **Deliberation in the meeting**

*ERLDC sensitized OCC members on the issue and insisted upon the concerned parties to take actions as given in the agenda.*

*OCC agreed with ERLDC submission and requested concerned parties to take appropriate action in this regard and submit the status report in the next OCC meeting.*

#### **ITEM NO. C.7: PRIORITIZATION OF ICT PROCUREMENT FOR CHUKHA TRANSMISSION SYSTEM --- ERLDC**

At present in Chukha Transmission system, 1 No. 100 MVA 220 / 132 kV ICT at Siliguri, one no. 100 MVA, 220/132 kV ICT and one no. 50 MVA, 220/132 kV ICT at Birpara and 3 x 50 MVA, 220/132 kV ICT at Malda are available to cater the total load of North Bengal and Sikkim. The transformation capacity is not sufficient to cater peak load of North Bengal and Sikkim. The above transformers (except one no 50 MVA, 220/132 kV ICT at Malda ) are of 25 years vintage and could not be loaded upto full capacity leading to further constraint to meet increasing load growth in North Bengal and Sikkim area and load shedding has to be resorted to for limiting ICT loading.

In the ERPC forum, meeting, following elements were approved :-

1. 1 No. 160 MVA, 220/132 kV ICT at Siliguri which will run in parallel with existing 100 MVA ICT.
2. 1 No. 160 MVA, 220/132 kV ICT at Birpara which will be installed in place of 50 MVA ICT presently available ( 160 MVA & 100 MVA ICTs to run in parallel).
3. 2 Nos. 160 MVA, 220/132 kV ICT at Malda which will replace existing 2 Nos. 50 MVA, 220/132 kV ICT and will run parallel with one no 50

MVA, 220/132 KV ICT of newer vintage .

GM, ERLDC vide his letter dated 2<sup>nd</sup> February has already asked for prioritisation of procurement and commissioning of above said ICT in the following manner:

1. 160 MVA, 220/132 kV ICT at Siliguri
2. 160 MVA, 220/132 kV ICT at Birpara.
3. 2x 160 MVA 220/132 kV ICT at Malda

Members may discuss.

#### **Deliberation in the meeting**

*ERLDC impressed upon PGCIL to prioritize the procurement of the ICTs in the above manner. OCC reminded PGCIL about the urgency of the 160 MVA ICT at Siliguri and requested PGCIL to explore diverting at least one 160 MVA 220/132 kV ICT to Siliguri from other projects.*

*OCC decided to place this matter before ensuing TCC meeting.*

#### **ITEM NO. C.8: APPLICATION OF CONGESTION PROCEDURE --- ERLDC**

Congestion charge was applied between WR-NR link On 26/01/11(between 14:00-15:45 hrs), and 27/01/11(between 14:00-15:15hrs) due to constraint of transmission network as per procedure laid down by Hon'ble CERC. Infrastructures required for applying/withdrawing congestion charge for ER are being kept ready at ERLDC for posting in website as well as through SCADA system as per procedure laid down by Hon'ble CERC. The procedure of relieving congestion issued by Hon'ble CERC is enclosed in Annexure-III.

Members may discuss.

#### **Deliberation in the meeting**

*Members noted.*

#### **ITEM NO. C.9: DECOMMISSIONING OF 63 MVAR BUS REACTOR-I OF NEW PURNEA S/S FOR SHIFTING OF THE SAME TO BINAGURI CKT-III AS LINE REACTOR AT NEW PURNEA S/S --- PGCIL**

With reference to the discussion in the Standing Committee Meeting on Power System Planning in Eastern Region held at Mirik, Darjeeling on 22.06.06, wherein its was decided for shifting of 400 kV, 63 MVAR bus reactor installed at New Purnea s/s to 3<sup>rd</sup> circuit of Binaguri line at New Purnea S/s for installation of 125 MVAR bus rector under ERSS-II.

Mobilisation for dismantling and shifting of 63 MVAR bus reactor of New Purnea s/s has commenced. Shutdown for the dismantling/shifting/de-commissioning of 63 MVAR bus reactor has been taken w.e.f. 01.02.10 for early commissioning of the same in the 3<sup>rd</sup> circuit of Binaguri line of New Purnea s/s. Hence 63 MVAR will not be considered as an element for system availability purpose. New bus reactor (125 MVAR) and 63 MVAR line reactor shall be included after commissioning/DOCO.

Members may kindly approved shifting of 63 MVAR bus reactor at New Purnea substation to Binaguri ckt-III as line reactor at New Purnea substation.

**Deliberation in the meeting**

*Shifting of above 63 MVAR bus reactor was already approved in ERPC. Members noted the progress in this regard and now-onwards this reactor would not be considered for system availability.*

**ITEM NO. C.10: CHARGING OF 125 MVAR, 400 kV BUS REACTOR AT NEW PURNEA S/S --- PGCIL**

One no 125 MVAR 400 kV bus reactor was commissioned at 17:18 hrs on 27.01.2011 at New Purnea substation under ERSS-II scheme. The element is put under DOCO w.e.f. 01.02.11.

In this regard, Teesta HEP, NHPC stated that Teesta power station is facing continuous high voltage since its commissioning through 400 kV Teesta-Binaguri D/c. During deliberations in ERPC forum, it was stated that installation of 2x125 MVAR bus reactor at Binaguri substation would minimize the high voltage problem. Therefore, NHPC requested to update the status of the reactors.

Members may discuss.

**Deliberation in the meeting**

*Members noted the commissioning of 125 MVAR bus reactor at New Purnea. PGCIL informed that second 125 MVAR bus reactor at New Purnea would take another 2-3 months.*

*Regarding status of bus reactor at Binaguri, PGCIL informed that foundation work was completed and hopefully they would receive reactor by March 2011 and commission the same by September 2011.*

**PART D: OPERATIONAL PLANNING**

**ITEM NO. D.1: ANTICIPATED POWER SUPPLY POSITION FOR THE MONTH OF MARCH'11**

The abstract of peak demand (MW) vis-à-vis availability and energy requirement vis-à-vis availability (MU) for the months of March'11 were prepared by ERPC Secretariat on the basis of finalized LGBR for 2010-11, keeping in view that the units are available for generation and expected load growth etc. The details are at placed for discussion.

Members may confirm.

**Deliberation in the meeting**

*After incorporation of comments from constituents, revised anticipated*

power supply position for the month of March 2011 is at **Annexure-IV**.

**ITEM NO. D.2: PROLONGED OUTAGE OF POWER SYSTEM ELEMENTS IN ER**

Concerned utilities may share the latest status on outage of above elements:

| Name<br>(1)  | Date of Outage<br>(2) | Reason<br>(3)               | Restoration Status<br>(4)                            |
|--|-----------------------|-----------------------------|--|
| DPL#7 (300 MW)   | 30/05/10              | Rotor problem               | Likely to be restored by 15 <sup>th</sup> April 2011 |
| CTPS#7(250 MW)   | 24/04/10              | Rotor problem               | Work is progress and would be restored by June 2011  |
| 400Kv Malda-Purnea -I                                      | 24/07/09              | Tower collapse at Loc.71    | Restored on 28.01.11                                 |
| 400Kv Malda-Purnea -II                                     | 07/07/10              | Tower collapse at Loc.74,75 | Restored on 28.01.11                                 |
| 400 kV Tala - Binaguri - II                                | 29/05/10              | XLPE Cable problem at TALA  | Likely to be restored by May 2011                    |
| 220 kV Purnea-Dalkhola D/c                                 | 13/04/10              | Tower Collapse              | Likely to be restored by February 2011               |
| 220 kV Ara - Khagol D/C                                    | 30/05/10              | Tower Collapse              | Line restored on normal towers on 01.02.11           |
| 315 MVA ICT-II at Biharshariff                             | 05/10/10              | Fire Hazard                 | Likely to restored by 10 <sup>th</sup> March 2011    |
| 50MVAR Line Reactor of 400KV KhSTPP-Maithon- II at Maithon | August,2009           | Fire Hazard                 | Likely to restored by June 2011                      |

**Deliberation in the meeting**

*Updated status is given in the above table.*

**ITEM NO. D.3: SHUTDOWN PROPOSAL OF TRANSMISSION LINES AND GENERATING UNITS FOR THE MONTH OF MARCH'11.**

Shutdown proposals of the generating stations for the month of February'11 as agreed during preparation of LGBR for the year 2010-11 are placed for discussion. Shutdown proposals of transmission elements as received are also placed for discussion. Deviations, if required, may please be intimated along with reasons.

Members may discuss.

**Deliberation in the meeting**

*Approved programme of generating stations and transmission elements during the month of March 2011 is at **Annexure-V**.*

**PART E: OTHER ISSUES**

**ITEM NO. E.1: RESTRICTED GOVERNOR MODE OF OPERATION -ERLDC**

As per clause no 5.2(f) of IEGC, thermal and hydro units of ER are expected to operate under Restricted Governor mode w.e.f 01.08.2010.

Hon'ble CERC vide letter no-CERC/RGMO/2010 dated 17/19.01.2011 has asked NLDC for a list of generating stations which are eligible for RGMO but have not put their machines on RGMO and a list of generating stations which has implemented RGMO but are not giving adequate response.

ERLDC sent a report to Hon'ble CERC through NLDC furnishing details and observation of ERLDC on the performance of each unit eligible for RGMO based on SCADA data which is enclosed in **Annexure-VI**.

Members may discuss.

**Deliberation in the meeting**

*Members noted.*

**ITEM NO. E.2: NON-COMPLIANCE OF DIRECTIONS ISSUED BY SLDC -- ERLDC**

Vide clause no 5.5.1.c (h) of IEGC, non-compliance of SLDC direction by SEB/Distribution licenses/bulk consumers to curtail overdrawal is to be reported to ERLDC for incorporating the same in weekly report to be prepared and published by ERLDC.

All SLDCs are to inform ERLDC the instances of non-compliance of SLDC directions by SEB/Distribution licenses/bulk consumers to curtail overdrawal, within two days after the day of operation.

No report from any constituent received for the month of January'11.

Members may note.

**Deliberation in the meeting**

*Members noted.*

**ITEM NO. E.3: UFR OPERATION DURING THE MONTH OF JANUARY'11**

As system frequency remained above 48.5 Hz, no UFR operation took place in ER grid during the month.

Members may note.

**Deliberation in the meeting**

*Members noted.*

**ITEM NO. E.4: IMPORTANT EVENTS DURING THE MONTH OF JANUARY'11**

- i. 400 KV Binaguri-Purnia-III restored on normal tower on 10/01/2011 at 17:35 hrs, which was on ERS tower.
- ii. 220 kV D/c Arah-Khagul transmission line was charged at 21:15 hrs on 01.02.11 for both circuits after restoration of river crossing towers which were collapsed due to heavy cyclonic effects.
- iii. 400 KV Mejia-DSTPS line section, which is made by LILoing at DSTPS by

- using erstwhile 400 KV Mejia- Maithon S/C and underconstructed 400 KV Durgapur-Jamshedpur D/C as a temporary measure, charged for the first time on 22/01/2011 at 16:20 hrs .
- iv. 400 KV Maithon-DSTPS line section charged for the first time at 11:06 hrs of 23/01/2011 in line with with sl no-2.
  - v. 400 KV Binaguri-Purnia-IV restored on normal tower on 20/01/2011 at 16:35 hrs, which was on ERS tower.
  - vi. 125 MVAR Bus Reactor of New Purnia charged for the first time at 17:18 hrs of 27/01/2011.
  - vii. 400 KV Malda-New Purnia-I, which was out due to tower collapse since 24/07/2009, restored on normal tower at 20:13 hrs of 28/01/2011.
  - viii. 400 KV Malda-New Purnia-II, which was out due to ERS tower collapse since 07/07/2010, restored on normal tower at 19:59 hrs of 28/01/2011.

Members may note.

**Deliberation in the meeting**

*Members noted.*

**ITEM NO. E.5: REVIEW OF GRID PERFORMANCE DURING THE MONTH OF JANUARY'11**

ERLDC may kindly present the salient features of grid along with grid disturbances. (Grid disturbances in the month of January'11 are at Annexure-VII).

**Deliberation in the meeting**

*ERLDC presented the grid performance.*

**ITEM NO. E.6: PERMISSION FOR EXTENSION OF 220 KV BUS FROM NTPC SIDE TO JSEB SIDE FOR INSTALLATION OF ONE NO 100 MVA, 220/132/11 KV AUTO TRANSFORMER AT LALMATIA-JSEB**

Lalmatia S/s has one no. 100 MVA, 220/132 kV Power transformer, and is connected with 220kV Farakka-Lalmatia S/c line and 132 kV Lalmatia-Kahalgaoon S/c. JSEB has procured one no. 100 MVA, 220/132 kV Power transformer and decided to install it in JSEB side. As such extension of 220 kV bus from NTPC side to JSEB is essential for the installation of 2<sup>nd</sup> 100 MVA transformer at Lalmatia.

Members may discuss.

**Deliberation in the meeting**

*NTPC informed that the ownership of the present transformer along with 220kV system at Lalmatia substation is with M/s ECL and NTPC is only maintaining the substation on behalf of M/s ECL. Therefore, any permission for extension of 220 kV bus and installation of another 100 MVA transformer at Lalmatia needs to be taken from M/s ECL.*

*BSEB was requested to act accordingly.*

**ITEM NO. E.7: CONVERSION OF 220 KV TENUGHAT-BIHARSHARIFF LINE TO 400 KV LEVEL**

*Member Secretary, ERPC enquired PGCIL about the status of 400 kV Tenughat system and conversion of 220 kV Tenughat-Biharshariff line to 400 kV level. He also desired PGCIL to explore the possibility of getting diverted equipment from other sites to get at least one 400 kV bay at Tenughat commissioned early. PGCIL agreed to revert back shortly.*

*It was decided to take up this matter in the ensuing TCC meeting.*

*The meeting ended with thanks to the Chair.*

\*\*\*\*\*

Shutdown of Talcher - Kolar HVDC Pole I on 22.01.2011

Talcher - Kolar HVDC Pole I shutdown was accorded at 06:18 Hrs. The action undertaken are as follows :-

1. Jeypore - Gajuwaka Circuit I which was already switched off to control overvoltage, was taken into service also at 06:10 Hrs. FSC of this circuit was switched on at around 07:25 Hrs. in order to export more power through Jeypore - Gajuwaka section.
2. The total power flow through Jeypore - Gajuwaka both circuits were maintained at around 450 - 500 MW.
3. HVDC Pole-I was switched off at 06:18 Hrs. No backing down was resorted to at Talcher Stage - II and its generation and was maintained at 1900 MW.
4. SR drew to the tune of 1100 MW through single pole and Talcher bus coupler flow was maintained at around 800 MW (towards ER). All import schedules from WR / NR through ER system were reduced and ER - WR schedule was raised to 700 MW for the purpose of wheeling of power of Talcher Stage - II via Ramagundam - Bhadrabati.
5. The aforesaid shutdown, however, led to a critical load on Farakka - Kahalgaon Circuit I and II for some time when each circuit flow exceeded 600 MW. However, with reduction of drawal by NR, the line flow could be contained at around 550 MW / circuit.
6. During the shutdown, Maithon - Jamshedpur Circuit I (via Mejia - Andal section) remained out because of commissioning activities of charging of line upto Andal. While 400kV Mejia - Andal section could be idle charged from Mejia end at 16:18 Hrs, the 400 KV Maithon - Andal section could be idle charged from Maithon at 21:01 Hrs. Synchronisation of the two sections at Andal could not be done because of some left out work at Andal end. This led to reduced redundancy in the Jamshedpur - Maithon corridor.
7. During the shutdown, 400kV Rourkella - Talcher Circuit I tripped at 18:30 Hrs due to failure of insulator in the location No. 105. This led to heavy inrush of power flow through Circuit II that touched around 600 MW. Power flow through this circuit was controlled by ramping up the export through HVDC Gajuwaka from 450MW to 600MW.
8. The shutdown was normalized at 21:09 Hrs. But immediately after de-blocking Talcher - Kolar Pole - I, it tripped and Pole-II went under Ground Return mode. This led to sudden increase of power flow through Talcher - Rourkella circuit II which touched around 1000 MW. Immediate backing down of around 500MW was resorted to at

Talcher Stage-II as power injected to ER system through bus coupler touched to the tune of 1700 MW.

9. Generations at Orissa were also backed down and a major contingency could be avoided.
10. With normalization of both poles, all the normal schedules were restored.

### **Shutdown of Talcher - Kolar HVDC Bi- Pole on 23.01.2011**

1. Although the Bi-pole shutdown was scheduled from 06:00 Hrs. to 22:00 Hrs. on 23.01.2011, the shut down could not be allowed because of network depletion due to outage of 400kV Rourkella - Talcher Circuit I and 400kV Mejia - Andal - Maithon section. 400kV Jamshedpur-Mejia-Andal-Maithon - Andal was normalized at 12:20 Hrs. and Rourkella - Talcher Circuit I was normalized at 12:50 Hrs.
2. As import through Talcher Bus coupler was allowed for 1000 MW, TSTPP Stage - II backed down its generation upto 650 MW with all its 4 units by taking oil support. Pole II was switched off at 11:46 Hrs, While Pole-I was switched off at 14:43 Hrs. Talcher inter-connector flow was restricted at 1000 MW. SR could absorb around 600MW through Jeypore- Gajuwaka, during the period of shutdown.
3. Being a holiday on 23.01.2011, West Bengal demand remained low. However, West Bengal resorted to backing down. Shares were also surrendered from Farakka to the tune of 1350 MW. Thus, Farakka - Kahalgaon line flow remained within limits of 550 MW / circuit.
4. Pole I was normalized at 06:49 Hrs. on 24.01.2011, while pole - II remained under shutdown for its planned work to be undertaken on 24.01.2011.

**ANNEXURE- I(a)****Feedback on final Programme of Maintenance Of Transmission Lines and Generating Units for January'11****(A) GENERATING UNITS (>100 MW) :**

| Agency | Station     | Unit no.   | Capacity (MW) | Approved   | Reason of S/d             | Actual            |
|--------|-------------|------------|---------------|--|---------------------------|-------------------|
| WBDCL  | KTPP        | Unit No 6  | 210           | 10.12.10 to 29.12.10   | Boiler overhauling        | 03.01.11-13.01.11 |
| WBDCL  | BKTPP       | Unit No 2  | 210           | 10.12.10 to 17.12.10   | Under short shut down     | 21.12.10-11.01.11 |
| CESC   | Budge-Budge | Unit No 2  | 250           | 04.01.11 to 02.02.11   | Boile+Turbinre inspection | 04.01.11-15.02.11 |
| OHPC   | Indravati   | Unit no. 1 | 150           | 20.12.10 to 17.01.10   | Annual Overhauling.       | NA                |
| NHPC   | Teesta      | Unit no. 2 | 170           | One week after return of U#3 shutdown w.e.f. 17.12.10 to 12.01.11. | Annual Overhauling.       | 17.01.11-02.02.11 |
| DGPC   | Tala        | Unit no. 4 | 170           | 05.01.11 to 17.02.11   | Annual Overhauling.       | 05.01.11-17.02.11 |

**(B) TRANSMISSION ELEMENTS:**

| Organization           | Name of the Element              | From     |          | To       |          | Actual    |
|------------------------|----------------------------------|----------|----------|----------|----------|-----------|
|                        |                                  | Date     | Time hrs | Date     | Time hrs |           |
| <b>Farakka, NTPC</b>   |                                  |          |          |          |          |           |
|                        | 220 kV Farakka-Lalmatia          | 13.01.10 | 0930     | 13.01.10 | 1500     | 19.01.11  |
| <b>Kahalgaon, NTPC</b> |                                  |          |          |          |          |           |
|                        | 400 kV Kahalgaon- Maithon line-2 | 05.01.11 | ODB      | 05.01.11 | ODB      | 05.01.11  |
|                        | 400 kV Kahalgaon-Patna line -1   | 19.01.11 | ODB      | 19.01.11 | ODB      | Not taken |
|                        | 132 kV Kahalgaon-Kahalgaon       | 15.01.11 | ODB      | 15.01.11 | ODB      | 15.01.11  |
| <b>Talcher, NTPC</b>   |                                  |          |          |          |          |           |
|                        | 400 kV TSTPP, ICT#1              | 21.12.10 | OCB 0900 | 23.12.10 | OCB 1600 | Not taken |
|                        | 220 kV TSTPS-TTPS                | 04.01.11 | OCB      | 05.01.11 | OCB      |           |
|                        | 220 kV TSTPS-TTPS                | 24.01.11 | OCB      | 25.01.11 | OCB      |           |

|                                    |                      |              |                      |              |                              |
|------------------------------------|----------------------|--------------|----------------------|--------------|------------------------------|
| 220 kV TSTPS-Meeramundali#1        | 11.01.11             | OCB          | 12.01.11             | OCB          |                              |
| 220 kV TSTPS-Meeramundali#2        | 18.01.11             | OCB          | 19.01.11             | OCB          |                              |
| <b>Powerlink</b>                   |                      |              |                      |              |                              |
| 400 kV Siliguri-Purnea circuit-III | 04.01.11             | OCB          | 11.01.11             | OCB          | 15.02.11-<br>continuing      |
| 400 kV Siliguri-Purnea circuit-IV  | 12.01.11             | OCB          | 19.01.11             | OCB          | to be taken from<br>23.02.11 |
| <b>Powergrid</b>                   |                      |              |                      |              |                              |
| 315 MVA ICT-I at New Purnea S/s    | 10.12.10             | ODB<br>0900  | 10.12.10             | ODB<br>1700  | 10.12.10                     |
| 315 MVA ICT-II at New Purnea S/s   | 11.12.10             | ODB<br>0900  | 11.12.10             | ODB<br>1700  | Not taken                    |
| 100 MVA ICT-III at Purnea S/s      | 20.12.10             | ODB<br>0900  | 20.12.10             | ODB<br>1500  | 21.12.10                     |
| 100 MVA ICT-I at Purnea S/s        | 21.12.10             | ODB<br>0900  | 21.12.10             | ODB<br>1500  | 22.12.10                     |
| 100 MVA ICT-II at Purnea S/s       | 22.12.10             | ODB<br>0900  | 22.12.10             | ODB<br>1500  | Not taken                    |
| 132 kV Purnea-Purnea (BSEB)-I      | 23.12.10             | ODB<br>0900  | 23.12.10             | ODB<br>1700  | 23.12.10                     |
| 132 kV Purnea-Purnea (BSEB)-II     | 24.12.10             | ODB<br>0900  | 24.12.10             | ODB<br>1700  | 24.12.10                     |
| 132 kV Purnea-Purnea (BSEB)-III    | 27.12.10             | ODB<br>0900  | 27.12.10             | ODB<br>1700  | 27.12.10                     |
| 132 kV Ara(PG)-Ara(BSEB) @@@       | 28.01.11             | ODB<br>0900  | 28.01.11             | ODB<br>1700  | 28.01.11                     |
| 132 kV Ara(PG)-Dumraon(BSEB)       | 29.01.11             | ODB<br>0900  | 29.01.11             | ODB<br>1700  | 29.01.11                     |
| 400 kV Mejia-Jamshedpur line       | 15.12.10             | ODB<br>0900  | 15.12.10             | ODB<br>1700  | Not taken                    |
| Talcher Bipole                     | 23.01.11             | 0700         | 23.01.11             | 2200         | 23.01.11                     |
| Talcher Pole-2                     | 23.01.11             | 2200         | 24.01.11             | 1900         | 24.01.11                     |
| Talcher Pole-2                     | 25.01.11<br>27.01.11 | 0700<br>0700 | 25.01.11<br>27.01.11 | 1900<br>1900 | 25.01.11<br>27.01.11         |
| Talcher Pole-1                     | 28.01.11             | ODB<br>0700  | 30.01.11             | 1900<br>1900 | 30.01.11                     |

OCB: On Continuous basis, ODB: On Daily Basis

Coal Details for the Month of .....

| Type                           | Units   | Imported Coal |          |          | Linkage/Captive Coal |          |          | E Auction Coal |          |          | Total |
|--------------------------------|---------|---------------|----------|----------|----------------------|----------|----------|----------------|----------|----------|-------|
|                                |         | Source-1      | Source-2 | Source-3 | Source-1             | Source-2 | Source-3 | Source-1       | Source-2 | Source-3 |       |
| Source                         |         |               |          |          |                      |          |          |                |          |          |       |
| OB Quantum                     | MMT     |               |          |          |                      |          |          |                |          |          |       |
| WAP for last month             | Rs/MT   |               |          |          |                      |          |          |                |          |          |       |
| Purchase for the Month         | MMT     |               |          |          |                      |          |          |                |          |          |       |
| Transit & Handling Loss        | MMT     |               |          |          |                      |          |          |                |          |          |       |
| Net Quantum of purchase        | MMT     |               |          |          |                      |          |          |                |          |          |       |
| Cost of purchased coal         | Rs      |               |          |          |                      |          |          |                |          |          |       |
| Transportation Cost            | Rs      |               |          |          |                      |          |          |                |          |          |       |
| Other Expenses, if any         | Rs      |               |          |          |                      |          |          |                |          |          |       |
| Total Cost of Purchase         | Rs      |               |          |          |                      |          |          |                |          |          |       |
| Rate of purchased coal         | Rs/MT   |               |          |          |                      |          |          |                |          |          |       |
| WAP for current month          | Rs/MT   |               |          |          |                      |          |          |                |          |          |       |
| Consumption for the Month      | MMT     |               |          |          |                      |          |          |                |          |          |       |
| CB Quantum                     | MMT     |               |          |          |                      |          |          |                |          |          |       |
| Wt. Avg. GCV for last month    | Kcal/Kg |               |          |          |                      |          |          |                |          |          |       |
| Wt. Avg. GCV of purchased coal |         |               |          |          |                      |          |          |                |          |          |       |
| Wt. Avg. GCV for current month |         |               |          |          |                      |          |          |                |          |          |       |

Verified  
Statutory Auditor

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**No.L-7/139(159)/2008**

**Coram:**

1. Dr. Pramod Deo, Chairperson
2. Shri S.Jayaraman, Member
3. Shri V.S.Verma, Member
4. Shri M.Deena Dayalan, Member

**Date of order: 11.6.2010**

**In the matter of**

Approval of detailed procedure for relieving congestion in real time operation under regulation 4 (2) of the Central Electricity Regulatory Commission (Measures to relieve congestion in real time operation) Regulations, 2009.

**And in the matter of**

Rate of congestion charge in real time operation in inter-State transmission of electricity.

**ORDER**

Clause (2) of Regulation 4 of the Central Electricity Regulatory Commission (Measures to relieve congestion in real time operation) Regulations, 2009 (hereinafter referred to as "the congestion charge regulations) provides as under:

"Congestion charge may be imposed on any Regional entity or entities in any Region or Regions for causing congestion and paid to any Regional entity or entities in any Region or Regions for relieving congestion as per the detailed procedure under these regulations formulated by NLDC and approved by the Commission".

2. The National Load Despatch Centre (NLDC) in its letter No. CSO/CERC, dated 5th April, 2010 has submitted the "Detailed procedure for relieving congestion in real time operation".

3. We hereby approve the detailed procedures titled "Procedure for relieving congestion in real time operation" in exercise of our power under regulation 4(2) of the congestion charge regulations. The approved procedure is enclosed as Annexure-I to this order. NLDC is directed to append the order relating to rate of congestion charge in real time operation in inter-State in inter-State transmission in electricity issued by the Commission from time to time with the detailed procedure.

4. NLDC is further directed to submit the details of congestion charge account for every month as per format appended as Annexure -II to this order.

5. We direct the National Load Despatch Centre to give wide publicity to the procedure for the information of and compliance by all concerned.

6. We also direct the National Load Despatch Centre to operationalise the procedure as per Annexure to this order with immediate effect.

|   |                                     |                                       |   |
|---|-------------------------------------|---------------------------------------|---|
| <b>Sd/-</b>                               | <b>sd/-</b>                         | <b>sd/-</b>                           | <b>sd/-</b>                                   |
| <b>(M.DEENA DAYALAN)</b><br><b>MEMBER</b> | <b>(V.S.VERMA)</b><br><b>MEMBER</b> | <b>(S.JAYARAMAN)</b><br><b>MEMBER</b> | <b>(Dr. PRAMOD DEO)</b><br><b>CHAIRPERSON</b> |

**Detailed Procedure for Relieving Congestion in Real Time Operation**

**Prepared in compliance to Section 4(2) of  
The Central Electricity Regulatory Commission  
(Measures to relieve congestion in real time operation)  
Regulations, 2009**

**(Revision: 0 Dated: 05.04.10)**

**National Load Despatch Centre**

## **Real Time Congestion Management Procedure**

### **1. Background**

- 1.1. This Procedure is issued in compliance to Regulation 4(2) of the “Central Electricity Regulatory Commission (Measures to relieve congestion in real time operation) Regulations, 2009. All regional entities shall abide by this procedure.
- 1.2. This procedure will be implemented with effect from the date of approval by the Commission.

### **2. Transfer Capability**

- 2.1. “Total Transfer Capability (TTC)” means the amount of electric power that can be transferred reliably over the inter-control area transmission system under a given set of operating conditions considering the effect of occurrence of the worst credible contingency.
- 2.2. “Transmission Reliability Margin (TRM)” means the amount of margin kept in the total transfer capability necessary to ensure that the interconnected transmission network is secure under a reasonable range of uncertainties in system conditions.
- 2.3. “Available Transfer Capability (ATC)” means the transfer capability of the inter-control area transmission system available for scheduling commercial transactions (through long term access, medium term open access and short term open access) in a specific direction, taking into account the network security. Mathematically ATC is the Total Transfer Capability less Transmission Reliability Margin.
- 2.4. TTC is dependent upon the network topology, point and quantum of injection /drawal and power flows in other paths of the interconnected network as well as prevailing voltage profile in the network during the assessment period.
- 2.5. TTC is directional in nature and the transfer capability for import of power in a region or control area from another region or control area may be different from

the transfer capability for export of power from that region or control area to the other region or control area.

- 2.6. Total Transfer Capability is time variant and there could be different figures for different time of the day/ month/ season/ year.
- 2.7. Transfer Capability shall be mentioned in MW.

### **3. Methodology for assessment of TTC, TRM and ATC**

- 3.1. The methodology shall be in harmony with the detailed procedure of the Central Transmission Utility (CTU) prepared under the Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-State Transmission and related matters) Regulations, 2009 so as not to have different methodology for determination of TTC, TRM and ATC by the CTU in respect of long-term access and medium-term open access and NLDC/ RLDCs in respect of short-term open access.
- 3.2. TTC assessment is required for reliable system operation and to facilitate non discriminatory open access in transmission as per CERC regulations on Open Access and Power Markets.
- 3.3. TTC and TRM shall be assessed with the help of simulation studies carried out for a representative scenario to arrive at an initial or base case. Simulation studies may require setting up of a power system model and obtaining a power flow solution. The construction of an accurate base case power system model is a key step in the execution of a meaningful study.

#### **3.4. Power System model to be considered for simulation studies**

- 3.4.1. EHV transmission network shall be normally modeled down to 220 kV level with exceptions for generating units connected at 132 kV and for North Eastern Region, it shall be modeled down to 132 kV.
- 3.4.2. Normally all generating units greater than 50 MW and connected at 132 kV and above shall be modeled. Smaller generating units (particularly hydro units) may be lumped for study purposes.
- 3.4.3. Load shall be generally lumped at 220 kV or 132 kV, as the case may be. Actual system data wherever available shall be used for power system

modeling. In cases where data is not available, standard data as given in the CEA Manual on Transmission Planning Criteria shall be considered.

3.4.4. The requirements at clauses 3.3.1 to 3.3.3 are for use of data for RLDCs and NLDC. The SLDC may consider lower voltage level and smaller units if required.

3.5. Separate base cases calculating the export and import capability corresponding to both peak and off- peak load and generation with the likely scenario during the time frame for which transfer capability is to be assessed shall be used in the Simulation Studies for calculation of TTC and TRM of the required transmission corridors.

### 3.6. **Input Data for Base Case Preparation**

3.6.1. **Network Topology:** This shall be as per network data obtained from CTU and STUs. New transmission elements shall be considered only after the date of commissioning of that asset and duly considering their reliability during initial period.

3.6.2. **Unit Availability:** This shall be as per the maintenance schedule finalized by RPC. The new generating units expected to be available during the assessment period shall be considered only after commissioning of the new units and duly considering their reliability during initial period.

3.6.3. **Coal Fired Thermal Despach:** This shall be as per the anticipated ex-bus generation of the thermal generating units arrived after deducting a normative auxiliary consumption as per the norms specified by Central Commission. and provisioning for partial outage based on experience of system operator from the installed capacity

3.6.4. **Gas/ Nuclear Despach:** This shall be as per past trend of Plant Load Factor available with Central Electricity Authority (CEA) or as per past trend available at SLDCs/ RLDCs.

3.6.5. **Hydro Despach:** This shall be as per the past trend available at RLDCs/ SLDCs. The day corresponding to the median value of daily consumption of the same month last year would be chosen. The current inflow pattern shall also be considered.

- 3.6.6. **Reactive power capability of generating units:** As per the generator capability curve or based on the assumption recommended in CEA's Manual on Transmission Planning Criteria.
- 3.6.7. **Nodal MW demand :** As per the anticipated load provided by SLDCs or Load Generation Balance Report (LGBR) prepared by CEA or past trend available at RLDCs/ NLDC.
- 3.6.8. **Nodal MVAR demand:** As per the anticipated power factor provided by SLDCs. In the absence of data from SLDCs, the load power factor at 220kV or 132 kV voltage levels shall be taken as 0.85 lag during peak load condition and 0.9 lag during light load condition except areas feeding predominantly agricultural loads where power factor can be taken as 0.75 and 0.85 for peak load and light load conditions as given in the CEA's Manual on Transmission Planning Criteria. This would be verified, post facto, with actual data, and if different, would be made more accurate for the future.
- 3.6.9. Normal Operating limit for a transmission line shall be equal to the permissible line loading limit as defined in the CEA Manual on Transmission Planning Criteria. Normal operating limit for an Inter connecting transformer shall be 90 % of its Maximum Continuous Rating (MCR).
- 3.6.10. Emergency limit for a transmission element shall be taken as 110 % of the normal operating limit.
- 3.7. In case data from any of the sources mentioned above is unavailable or in case of additional data requirement, reasonable assumptions shall be made.
- 3.8. Total Transfer Capability between two areas would be assessed by increasing the load in the importing area and increasing the generation in the exporting area or vice versa till the constraints are hit for a credible contingency. The following credible contingencies shall be considered:
- 3.8.1. Outage of single transmission element (N-1) in the transmission corridor or connected system whose TTC is being determined as defined in IEGC
- 3.8.2. Outage of a largest unit in the importing control area Station.

- 3.9. During assessment of Total Transfer Capability it shall be ensured that:
  - 3.9.1. All transmission element loadings in the base case are within normal operating limits and the voltages remain within operating range defined in the IEGC.
  - 3.9.2. All transmission element loadings after a credible contingency are within emergency ratings and grid voltage is within the operating range as defined in the IEGC.
- 3.10. The Total Transfer Capability shall be limited by
  - 3.10.1. Violation of grid voltage operating range or
  - 3.10.2. Violation of transmission element operating limit in the base case or
  - 3.10.3. Violation of emergency limit in the contingency case
- 3.11. Transmission Reliability Margin (TRM) shall be kept in the total transfer capability to ensure that the interconnected transmission network is secure under a reasonable range of uncertainties in system conditions. Computation of TRM for a region or control area or group of control areas would be based on the consideration of the following:
  - 3.11.1. Two percent (2%) of the total anticipated peak demand met in MW of the control area/group of control area/region (to account for forecasting uncertainties)
  - 3.11.2. Size of largest generating unit in the control area/ group of control area/ region
  - 3.11.3. Single largest anticipated in feed into the control area/ group of control area (which could be a combination of States for the purpose of Power Exchange and for others)/ region.

#### **4. Procedure for declaration of TTC, TRM, ATC and anticipated Constraints**

- 4.1. State Load Despatch Centre (SLDC) shall assess the Total Transfer Capability (TTC), Transmission Reliability Margin (TRM) and Available Transfer Capability (ATC) on its inter-State transmission corridor considering the meshed intra State corridors for exchange (import/ export) of power with inter-State Transmission System (ISTS). These figures along with the data considered for assessment of TTC would be forwarded to the respective RLDC for assessment

of TTC at the regional level. The details of anticipated transmission constraints in the intra State system shall also be indicated separately.

- 4.2. Regional Load Despatch Centres shall assess TTC, TRM and ATC for the inter regional corridors at respective ends, intra regional corridors (group of control areas) and for individual control areas within the region (if required) for a period of three months in advance. During assessment of TTC, the RLDCs would duly consider the input provided by the SLDCs. The TTC, TRM and ATC figures for the inter-regional corridors, intra regional corridors (group of control areas) and for individual control areas within the region (if required) along with all the input data considered shall be forwarded to NLDC. The details of anticipated transmission constraints in the intra regional system shall also be indicated separately.
- 4.3. National Load Despatch Centre (NLDC) shall assess the TTC, TRM and ATC) of inter and intra-regional links/ Corridors respectively for three months in advance for each month up to the fourth month based on :
  - 4.3.1. The inputs received from RLDCs
  - 4.3.2. TTC/ TRM/ ATC notified/ considered by CTU for medium-term open access.Sample format for declaration of TTC/TRM/ATC is enclosed as **Format-I**.
- 4.4. NLDC shall inform the TTC/ TRM/ ATC figures along with constraints observed in inter-regional/ intra-regional corridors to the RLDCs. These shall be put on the website of RLDCs as well as NLDC.
- 4.5. NLDC may revise the TTC, TRM and ATC due to change in system conditions (including commissioning of new transmission lines/ generation), vis-à-vis earlier anticipated system conditions which includes change in network topology or change in anticipated active or reactive generation or load, at any of the nodes in the study. Revisions may be done by NLDC based on its own observations or based on inputs received from SLDCs/ RLDCs. Revised TTC, TRM and, ATC shall be published on website of NLDC and RLDCs along with reasons thereof.

## **5. Declaration of congestion in real-time**

- 5.1. SLDCs/ RLDCs/ NLDC shall have a display available in their web-sites showing TTC, TRM, ATC declared in advance. Real time power flow in the corridor for

which TTC has been declared shall be displayed alongside for comparison. The voltage of the important nodes in the grid downstream/ upstream of the corridor shall also be displayed. The format of the display is enclosed as **Format II**.

- 5.2. A corridor shall be considered congested under the following circumstances:
  - 5.2.1. Grid voltage in the important nodes downstream/ upstream of the corridor is beyond the operating range specified in the IEGC and/or
  - 5.2.2. The real-time power flow along a corridor exceeds the ATC for that corridor for continuously one time block of 15-minute and/ or
  - 5.2.3. One or more transmission lines in the corridor are loaded beyond the operating limit.
- 5.3. Whenever actual flow on inter/ intra regional link/ corridor exceeds ATC and security criteria as mentioned in clause 5.2 are violated for continuously two time blocks, NLDC may issue a warning notice. In case SLDC observes congestion within the intra State grid it shall inform the respective RLDC which in turn shall inform the NLDC. The notice for congestion shall be communicated to all the Regional entities telephonically or through fax/ voice message/ e-mail and through postings on website and making the same available on the common screen at NLDC/ RLDCs/ SLDCs. The format of the notice is enclosed as **Format III**.
- 5.4. If the power flow on the corridor is as per the schedule, but the congestion has been caused by forced outages of a transmission line in the corridor, which occurs after the drawal schedule has been fixed, then open access transactions shall be curtailed in the priority given in the Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-State Transmission and related matters) Regulations, 2009 followed by revision of TTC, TRM and ATC. No congestion charge shall, however, be applicable in such a case.
- 5.5. If the power flow on the corridor is as per the schedule and the corridor is congested due to either of the circumstances mentioned in clauses 5.2.1 and 5.2.3 of this procedure then TTC, TRM and ATC shall be revised accordingly. No congestion charge shall, however, be applicable in such a case.
- 5.6. If congestion persists for 2 time-blocks not counting the time-block in which warning notice was issued by RLDC and no affirmative action by the defaulting agency is taken, NLDC/ RLDC(s) shall issue a notice for application of

congestion charge. This notice shall be communicated to all the concerned Regional entities telephonically or through fax message and through postings on website and making available the same at the common screen at NLDC/ RLDCs/ SLDCs. The format is enclosed as **Format IV**.

## **6. Applicability of Congestion Charge**

- 6.1. Congestion Charge shall be applicable to Regional entities as per the CERC (Measures to relieve congestion in real time operation) Regulations and orders on rate of congestion charge as applicable from time to time.
- 6.2. At frequency below 50 Hz, congestion charge would be levied for over drawal or under-injection in the importing control area and at frequencies above 50 Hz, congestion charge would be levied for under drawal or over-injection in the exporting control area.
- 6.3. Congestion charges may also become applicable for an intra-regional corridor of one region, if the congestion is attributable to other regional entities of other region.
- 6.4. Congestion charge shall be applicable only after two time blocks from the time of issuing the notice, not counting the time block in which notice is issued.
- 6.5. Congestion charge shall be withdrawn after the power flow on the affected transmission link/ corridor has come down to the ATC and remains at this level for one time block. NLDC/ RLDC shall communicate to all concerned Regional entities telephonically or through fax message/ e-mail and through postings on website and making available the same on the common screen available at NLDC/ RLDCs/ SLDCs for lifting of congestion charge. The format of the notice is enclosed as **Format-V**.

## **7. Rate of Congestion Charge**

- 7.1 The rate of congestion charge shall be as specified by the Commission from time to time, through an order.

## **8. Congestion Charge Accounting and Settlement**

- 8.1. At the end of the operating day, NLDC/ RLDC shall indicate the times when notice on application of congestion charge was given along with the reasons of

congestion. The format is enclosed as **Format-VI**. This format shall be available on the NLDC/ RLDCs websites.

- 8.2. Computation of congestion charge is a post facto event and shall be dictated by the average frequency in the 15-minutes time block as recorded by Special Energy Meters.
- 8.3. 'Congestion Charge account shall be settled on a weekly basis. This bank account shall be maintained and operated by RLDC in the same manner as the account for UI charges. The bank account details for congestion charge payment shall be intimated separately.
- 8.4. The statement of receipt and disbursement of congestion charge shall be issued by the Regional Power Committee Secretariat on weekly basis along with statement for Unscheduled Interchange charge.
- 8.5. The constituents required to pay congestion charge, shall pay the charges to the Congestion charge account within 10 days of issue of account and no cross adjustment with any other account would be allowed. Delay beyond 12 days after the issue of account for the short payment would attract a simple interest of 0.04% per day
- 8.6. RLDC shall release the amount to the Regional entities who have to receive congestion charge within three(3) working days after the receipt of the congestion charges.
- 8.7. The Commission will separately notify the procedure regarding the maintenance and operation of the funds accumulated out of the congestion charge.
- 8.8. RLDC shall submit a statement to the Commission on monthly basis, furnishing details of undisbursed amount.
- 8.9. The procedure shall be reviewed as and when required and shall be submitted to the Commission for approval.

## **9. Removal of Difficulties**

- 9.1 In case of any difficulty in implementation of this procedure, this procedure shall be reviewed or revised by NLDC with the approval from the Commission.

National / \_\_\_\_\_ Regional Load Despatch Centre

TOTAL TRANSFER CAPABILITY FOR mmmm, yyyy

Issue Date:

Issue Time:

Revision No.

| Corridor/<br>Control<br>Area | Date | Time<br>Period | Total<br>Transfer<br>Capability<br>(TTC) (MW) | Reliability<br>Margin<br>(RM) (MW) | Available<br>Transfer<br>Capability<br>(ATC) (MW) |
|------------------------------|------|----------------|---|------------------------------------|---|
|                              |      |                |   |                                    |   |
|                              |      |                |   |                                    |   |
|                              |      |                |   |                                    |   |
|                              |      |                |   |                                    |   |
|                              |      |                |   |                                    |   |
|                              |      |                |   |                                    |   |
|                              |      |                |   |                                    |   |
|                              |      |                |   |                                    |   |
|                              |      |                |   |                                    |   |
|                              |      |                |   |                                    |   |
|                              |      |                |   |                                    |   |
|                              |      |                |   |                                    |   |

Assumptions:

A. Load (MW)

| Region /<br>Entity Name | Peak<br>Load | Off Peak<br>Load |
|-------------------------|--------------|------------------|
|                         |              |                  |
|                         |              |                  |
| <b>Total</b>            |              |                  |

B. Generation(MW)

|              | Thermal |             | Hydro |          |
|--------------|---------|-------------|-------|----------|
|              | Peak    | Off<br>Peak | Peak  | Off Peak |
| <b>ISGS</b>  |         |             |       |          |
| <b>State</b> |         |             |       |          |

**C. Major Transmission Line Outages**

|                       | <b>Element</b> | <b>Voltage (kV)</b> | <b>Remarks</b> |
|-----------------------|----------------|---------------------|----------------|
| <b>Central Sector</b> |                |                     |                |
|                       |                |                     |                |
| <b>State Sector</b>   |                |                     |                |

**D. Generation Outages**

|                       | <b>Generating Unit</b> | <b>MW</b> | <b>Remarks</b> |
|-----------------------|------------------------|-----------|----------------|
| <b>Central Sector</b> |                        |           |                |
|                       |                        |           |                |
| <b>State Sector</b>   |                        |           |                |
|                       |                        |           |                |

**E. HVDC Settings**

| <b>Name</b> | <b>Setting (MW)</b> |
|-------------|---------------------|
|             |                     |
|             |                     |
|             |                     |

**F. Constraints**

**G. Miscellaneous**

Note: Format may be changed as per requirement with prior approval of the Commission.

National/\_\_\_\_\_Regional Load Despatch Centre

**CONGESTION MONITORING DISPLAY**

dd/mm/yyyy, hh:mm

| <b>Corridor/<br/>Control Area</b> | <b>TTC (MW)</b> | <b>ATC (MW)</b> | <b>Actual (MW)</b> |
|-----------------------------------|-----------------|-----------------|--------------------|
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |
|                                   |                 |                 |                    |

Note: Format may be changed as per requirement with prior approval of the Commission.

National/\_\_\_\_\_Regional Load Despatch Centre

Notice Number: (NLDC/RLDC)/yyyy/mm/.... Date: *dd/mm/yy*  
 Time of Issue: *hh:mm*

To

**WARNING NOTICE**

The actual transfer of electricity on following corridors has crossed the ATC.

| Corridor/Control Area | ATC (MW) | Actual Flow (MW) |
|-----------------------|----------|------------------|
|                       |          |                  |
|                       |          |                  |

The following regional entities, which are downstream of the congested corridor, are advised to reduce their drawl/increase their generation to decongest the system:

- 1.
- ...
- m.

The following regional entities, which are upstream of the congested corridor are advised to / increase their drawl/reduce their generation to decongest the system:

- 1.
- ...
- n.

**Shift Charge Manager**

This is a warning notice before levying of congestion charges and issued in accordance with the Central Electricity Regulatory Commission (Measures to relieve congestion in real time operation) Regulations, 2009

NLDC would send this notice to RLDC and RLDC would send this notice to regional entities

Note: Format may be changed as per requirement with prior approval of the Commission.

National/\_\_\_\_\_Regional Load Despatch Centre

Notice Number: (NLDC/RLDC)/yyyy/mm/....

Date: dd/mm/yy  
Time of Issue: hh:mm

To

**NOTICE FOR APPLICATION OF CONGESTION CHARGE**

Congestion charge for Unscheduled Interchange (UI) energy as per CERC (Measures for relieving congestion) Regulations 2009 dated 22<sup>nd</sup> December 2009 would be applicable w.e.f time block no. ( hh:mm )of **dd/mm/yyyy**.

| Corridor/Control Area | TTC (MW) | Actual Flow (MW) |
|-----------------------|----------|------------------|
|                       |          |                  |
|                       |          |                  |

Congestion charge would be applicable on the following regional entities, which are downstream of the congested corridor:

- 1.
- ...
- m.

Congestion charge would be applicable on the following regional entities, which are upstream of the congested corridor:

- 1.
- ...
- n.

**Shift Charge Manager**

Issued in accordance with the Central Electricity Regulatory Commission (Measures to relieve congestion in real time operation) Regulations, 2009

NLDC would send this notice to RLDC and RLDC would send this notice to regional entities

Note: Format may be changed as per requirement with prior approval of the Commission.

National/\_\_\_\_\_Regional Load Despatch Centre

Notice Number: (NLDC/RLDC)/yyyy/mm/.... Date: dd/mm/yy Time of Issue:  
*hh:mm*

To

**NOTICE FOR WITHDRAWAL OF CONGESTION CHARGE**

Congestion charge on Unscheduled Interchange (UI) energy that was applicable w.e.f **hh:mm of dd/mm/yyyy** vide **Notice Number....** issued at hh:mm of dd/mm/yyyy would be lifted w.e.f **time block no. (hh:mm) of dd/mm/yyyy.**

**Shift Charge Manager**

Issued in accordance with the Central Electricity Regulatory Commission (Measures to relieve congestion in real time operation) Regulations, 2009

NLDC would send this notice to RLDC and RLDC would send this notice to regional entities

Note: Format may be changed as per requirement with prior approval of the Commission.

National/\_\_\_\_\_Regional Load Despatch Centre

**STATEMENT ON NOTICE OF APPLICATION AND WITHDRAWAL OF CONGESTION CHARGE FOR**

**Date:**

**Issued on:**

| Application |           | Withdrawal |      | Downstream Regional Entities | Upstream Regional Entities |
|-------------|-----------|------------|------|------------------------------|----------------------------|
| Time Block  | Time      | Time Block | Time |                              |                            |
| 1           | 0000-0015 |            |      |                              |                            |
| 2           | 0015-0030 |            |      |                              |                            |
| 3           | 0030-0045 |            |      |                              |                            |
|             |           |            |      |                              |                            |
|             |           |            |      |                              |                            |
|             |           |            |      |                              |                            |
|             |           |            |      |                              |                            |
| 96          | 2345-0000 |            |      |                              |                            |

Note: Format may be changed as per requirement with prior approval of the Commission.

**Annexure - II**

**Format for submission of details of Congestion Charge by NLDC for the month of**

(Rs. in Lakh)

| <b>Sl. No.</b> | <b>Name of the RLDCs</b> | <b>Total Receipt of Congestion Charge</b> | <b>Total Disbursal of Congestion Charge</b> | <b>Undisbursed Amount in Congestion Charge Account</b> |
|----------------|--------------------------|---|---|--|
|                |                          |   |   |  |
|                |                          |   |   |  |
|                |                          |   |   |  |
|                |                          |   |   |  |
|                |                          |   |   |  |

## REVISED ANTICIPATED POWER SUPPLY POSITION OF ER DURING MARCH'11

| SL.NO | P A R T I C U L A R S  | Peak demand (MW) | Energy (MU) |
|-------|--|------------------|-------------|
| 1     | BIHAR  |                  |             |
|       | i) NET MAX DEMAND  | 2250             | 1180        |
|       | ii) NET POWER AVAILABILITY- Own Source   | 144              | 78          |
|       | - Central Sector   | 1134             | 769         |
|       | iii) SURPLUS(+)/DEFICIT(-)   | -973             | -334        |
| 2     | JHARKHAND  |                  |             |
|       | i) NET MAX DEMAND  | 1180             | 700         |
|       | ii) NET POWER AVAILABILITY- Own Source   | 710              | 408         |
|       | - Central Sector   | 324              | 207         |
|       | iii) SURPLUS(+)/DEFICIT(-)   | -146             | -85         |
| 3     | DVC  |                  |             |
|       | i) NET MAX DEMAND (OWN)  | 2250             | 1387        |
|       | ii) NET POWER AVAILABILITY- Own Source   | 2450             | 1090        |
|       | - Central Sector   | 58               | 31          |
|       | Long term Bi-lateral(200 MW MP+230(DTL)  | 400              | 320         |
|       | iii) SURPLUS(+)/DEFICIT(-)   | -142             | -585        |
| 4     | ORISSA   |                  |             |
|       | i) NET MAX DEMAND  | 3500             | 2073        |
|       | ii) NET POWER AVAILABILITY- Own Source   | 2360             | 1234        |
|       | - Central Sector   | 849              | 587         |
|       | iii) SURPLUS(+)/DEFICIT(-)   | -291             | -251        |
| 5     | WEST BENGAL  |                  |             |
| 5.1   | WBSEDCL  |                  |             |
|       | i) NET MAX DEMAND (OWN)  | 4620             | 2360        |
|       | ii) CESC's DRAWAL  | 420              | 68          |
|       | iii) TOTAL WBSEDCL's DEMAND  | 5040             | 2428        |
|       | iv) NET POWER AVAILABILITY- Own Source   | 3808             | 2221        |
|       | - Import from DPL  | -70              | -46         |
|       | - Central Sector   | 616              | 402         |
|       | v) SURPLUS(+)/DEFICIT(-)   | -686             | 149         |
| 5.2   | DPL  |                  |             |
|       | i) NET MAX DEMAND  | 280              | 198         |
|       | ii) NET POWER AVAILABILITY   | 210              | 151         |
|       | iii) SURPLUS(+)/DEFICIT(-)   | -70              | -46         |
| 5.3   | CESC   |                  |             |
|       | i) NET MAX DEMAND  | 1520             | 780         |
|       | ii) NET POWER AVAILABILITY - OWN SOURCE  | 1100             | 749         |
|       | FROM WBSEDCL   | 420              | 68          |
|       | iii) TOTAL AVAILABILITY  | 1520             | 817         |
|       | iv) SURPLUS(+)/DEFICIT(-)  | 0                | 37          |
| 6     | WEST BENGAL (WBSEDCL+DPL+CESC)<br>(excluding DVC's supply to WBSEDCL's command area) |                  |             |
|       | i) NET MAX DEMAND  | 6420             | 3337        |
|       | ii) NET POWER AVAILABILITY- Own Source   | 5118             | 3121        |
|       | - Central Sector   | 616              | 402         |
|       | iii) SURPLUS(+)/DEFICIT(-)   | -686             | 186         |
| 7     | SIKKIM   |                  |             |
|       | i) NET MAX DEMAND  | 110              | 47          |
|       | ii) NET POWER AVAILABILITY- Own Source   | 16               | 4           |
|       | - Central Sector   | 99               | 56          |
|       | iii) SURPLUS(+)/DEFICIT(-)   | 5                | 13          |
| 8     | EASTERN REGION<br>At 1.03 AS DIVERSITY FACTOR  |                  |             |
|       | i) NET MAX DEMAND  | 15642            | 8724        |
|       | Long term Bi-lateral(200 MW MP+230(DTL)  | 400              | 320         |
|       | ii) NET TOTAL POWER AVAILABILITY OF ER<br>(INCLUDING C/S ALLOCATION)                 | 13878            | 7987        |
|       | iii) PEAK SURPLUS(+)/DEFICIT(-) OF ER<br>(ii)-(i)                                    | -2163            | -1057       |

**ANNEXURE- V****Final Programme of Maintenance Of Transmission Lines and Generating Units for March '11****(A) GENERATING UNITS (thermal>100 MW, hydro>50 MW) : (As per LGBR program)**

| Agency | Station      | Unit no. | Capacity (MW) | Approved Programme in LGBR | Reason of S/d      | Remarks      |
|--------|--------------|----------|---------------|----------------------------|--------------------|--------------|
| NTPC   | Farakka STPS | 5        | 500           | 21.03.2011 to 31.03.2011   | Boiler maintenance | Not proposed |
| DGPC   | Chukha HEP   | II       | 90            | 01.03.2011 to 27.03.2011   | Annual Maintenance | Agreed       |
| DGPC   | Chukha HEP   | I        | 90            | 28.03.2011 to 31.03.2011   | Annual Maintenance | Agreed       |

**(B) TRANSMISSION ELEMENTS:**

| Organization           | Name of the Element                   | From     |          | To       |          | Remarks                            |
|------------------------|---------------------------------------|----------|----------|----------|----------|------------------------------------|
|                        |                                       | Date     | Time hrs | Date     | Time hrs |                                    |
| <b>Farakka, NTPC</b>   |                                       |          |          |          |          |                                    |
|                        | 220 kV Farakka-Lalmatia               | 10.03.11 | 0930     | 10.03.11 | 1630     | Relay testing                      |
| <b>Kahalgaon, NTPC</b> |                                       |          |          |          |          |                                    |
|                        | 400 kV Kahalgaon- Patna line-1        | 09.03.11 | ODB      | 09.03.11 | ODB      | Preventive maintenance and testing |
|                        | 132 kV Kahalgaon-Sabour               | 16.03.11 | ODB      | 16.03.11 | ODB      |                                    |
|                        | 400 kV Kahalgaon- Biharshariff line-3 | 23.03.11 | ODB      | 23.03.11 | ODB      |                                    |
|                        | 400 kV Kahalgaon- Biharshariff line-4 | 30.03.11 | ODB      | 30.03.11 | ODB      |                                    |
| <b>Talcher, NTPC</b>   |                                       |          |          |          |          |                                    |
|                        | 400 kV Talcher-Rengali #1             | 15.03.11 | ODB      | 17.03.11 | ODB      | Preventive maintenance and testing |
|                        | 400 kV Talcher-Rengalii#2             | 22.03.11 | ODB      | 24.03.11 | ODB      |                                    |
|                        | 400/11.5 kV start up#2 transformer    | 29.03.11 | ODB      | 30.03.11 | ODB      |                                    |

| <b>Powergrid, ER-I</b>                        |                      |            |                      |            |  |
|---|----------------------|------------|----------------------|------------|--|
| 400 kV Durgapur-Jamshedpur line               | 02.03.11<br>07.03.11 | ODB<br>ODB | 04.03.11<br>07.03.11 | ODB<br>ODB | Bay construction work of new durgapur tr. Line at Jamshedpur |
| 400 kV Kahalgaon-Biharshariff-I               | 21.03.11             | ODB        | 21.03.11             | ODB        | Construction work at Koderma bay at Biharshariff             |
| 400 kV Biharshariff-Muzzafarpur-I             | 07.03.11             | ODB        | 07.03.11             | ODB        | Construction work of Tenughat bay at Biharshariff            |
| 400 kV Biharshariff-Muzzafarpur-II            | 0803.11              | ODB        | 08.03.11             | ODB        | Construction work of Tenughat bay at Biharshariff            |
| 132 kV Dehri-Pusauli line                     | 08.03.11             | ODB        | 08.03.11             | ODB        | Annual Maintenance   |
| 132 kV Dehri-Pusauli & 132 kV Pusauli-Mohania | 09.03.11             | ODB        | 09.03.11             | ODB        | AMP of bay and 132 kV main bus at Pusauli end                |
| 132 kV Mohania-Karmanasa line                 | 10.03.11             | ODB        | 10.03.11             | ODB        | AMP of line and bay at Karmanasa end                         |
| 132 kV D/c Purulia-Chandrapura line of DVC    | 19.03.11             | ODB        | 19.03.11             | ODB        | Stringing work of 400 kV Maithon-Ranchi line                 |
| 132 kV D/c Ramkanali-Chandrapura line of DVC  | 23.03.11             | ODB        | 23.03.11             | ODB        | Stringing work of 400 kV Maithon-Ranchi line                 |

OCB: On Continuous basis, ODB: On Daily Basis

STATUS OF RGMO IN ER

ANNEXURE-VI

( Pg 1 of 3)

LIST OF GENERATING UNITS PARTICIPATING IN RGMO

| CONSTITUENT    | STATION     | UNIT | CAPACITY | STATUS OF RGMO AS INFORMED BY STATIONS          | ERLDC Obeservation             |
|----------------|-------------|------|----------|---|--------------------------------|
| NTPC           | FARAKKA     | 1    | 200      | Running under RGMO mode                         | Intermittent response observed |
|                |             | 2    | 200      | Running under RGMO mode                         |                                |
|                |             | 3    | 200      | Running under RGMO mode                         |                                |
|                |             | 4    | 500      | Kept in RGMO at 12:09hrs of 01.08.10            |                                |
|                |             | 5    | 500      | Taken in at 11:30hrs of 04.08.10                |                                |
|                | KAHALGAON   | 1    | 210      | Taken in at 00:00hrs of 01.08.10                | Intermittent response observed |
|                |             | 2    | 210      | Taken in at 00:00hrs of 01.08.10                |                                |
|                |             | 3    | 210      | Running under RGMO mode                         |                                |
|                |             | 4    | 210      | Running under RGMO mode                         |                                |
|                |             | 5    | 500      | Running under RGMO mode                         |                                |
|                |             | 6    | 500      | Taken in at 00:00hrs of 01.08.10                |                                |
|                |             | 7    | 500      | Running under RGMO mode                         |                                |
|                | TALCHER     | 1    | 500      | All units are running under RGMO mode           | Intermittent response observed |
|                |             | 2    | 500      |   |                                |
|                |             | 3    | 500      |   |                                |
| 4              |             | 500  |          |   |                                |
| 5              |             | 500  |          |   |                                |
| 6              |             | 500  |          |   |                                |
| TEESTA         | TEESTA      | 1    | 170      | Taken in RGMO mode at 00:00hrs of 01.08.10      | Response satisfactory          |
|                |             | 2    | 170      |   |                                |
|                |             | 3    | 170      |   |                                |
| DVC            | MEJIA       | 4    | 210      | Implemented(56Th OCC meeting)                   | Response not satisfactory      |
|                |             | 5    | 250      |   |                                |
| WBPDC          | BAKRESWAR   | 1    | 210      | RGMO implemented & in Service(56th OCC meeting) | Response not satisfactory      |
|                |             | 2    | 210      |   |                                |
|                |             | 3    | 210      |   |                                |
|                |             | 4    | 210      |   |                                |
|                |             | 5    | 210      |   |                                |
| CESC           | BUDGE BUDGE | 1    | 250      | Unit # 1,2 in FGMO & 3 in RGMO                  | Response not satisfactory      |
|                |             | 2    | 250      |   |                                |
|                |             | 3    | 250      |   |                                |
| TOTAL CAPACITY |             |      | 9710     |   |                                |

STATUS OF RGMO IN ER

LIST OF THERMAL GENERATING UNITS NOT PARTICIPATING IN RGMO

| CONSTITUENT           | STATION         | UNIT | CAPACITY    | STATUS OF RGMO AS INFORMED BY STATIONS   |
|-----------------------|-----------------|------|-------------|--|
| DVC                   | CHANDRAPURA TPS | 7    | 250         | RGMO detail is n't available   |
|                       | BOKARO 'B'      | 1    | 210         | Difficulties in implementing RGMO & exemption not applied(56th OCC meeting)            |
|                       |                 | 2    | 210         |  |
|                       |                 | 3    | 210         |  |
|                       | MEJIA           | 1    | 210         | Not Implemented & exemption not applied(56th OCC meeting)                              |
|                       |                 | 2    | 210         |  |
|                       |                 | 3    | 210         |  |
|                       |                 |      | 6           | 250  |
| WARIA                 |                 | 4    | 210         | Difficulties in implementing RGMO & exemption not applied(56th OCC meeting)            |
|                       |                 |      |             |  |
| JSEB                  | TENUGHAT        | 1    | 210         | Difficulties in implementing RGMO & exemption not applied(56th OCC meeting)            |
|                       |                 | 2    | 210         |  |
| OPGC                  | IBTPS           | 1    | 210         | Not adequate response in RGMO(56th OCC meeting)  |
|                       |                 | 2    | 210         |  |
| WBPDC                 | KOLAGHAT        | 1    | 210         | Old Units,difficulties in implementing RGMO and exemption not taken(56th OCC meting)   |
|                       |                 | 2    | 210         |  |
|                       |                 | 3    | 210         |  |
|                       |                 | 4    | 210         |  |
|                       |                 | 5    | 210         |  |
|                       |                 | 6    | 210         |  |
|                       | BANDEL          | 5    | 210         | Old Units,difficulties in implementing RGMO and exemption not applied(56th OCC meting) |
|                       | SANTALDIH       | 5    | 250         | RGMO detail is n't available   |
|                       | DPL             | 7    | 300         | Implemented but not yet tested(56Th OCC meeting)                                       |
|                       | SAGARDIGHI      | 1    | 300         | Not tested(56th OCC MEETING)   |
| 2                     |                 | 300  |             |  |
| <b>TOTAL CAPACITY</b> |                 |      | <b>5430</b> |  |

**STATUS OF RGMO IN ER**  
**LIST OF HYDRO GENERATING UNITS NOT PARTICIPATING IN RGMO**

ANNEXURE-VII

( Pg 3 of 3)

| CONSTITUENT         | STATION     | UNIT    | CAPACITY    | STATUS OF RGMO AS INFORMED BY STATIONS  | ERLDC Observation |
|---------------------|-------------|---------|-------------|---|-------------------|
| NHPC                | RANGIT      | 1       | 20          | Pondage capacity is to generate power upto 3 hours only.Hence not under the perview of RGMO |                   |
|                     |             | 2       | 20          |   |                   |
|                     |             | 3       | 20          |   |                   |
| DVC                 | MAITHON HPS | 1       | 20          | RGMO detail is n't available  | No response       |
|                     |             | 2       | 20          |   |                   |
|                     |             | 3       | 20          |   |                   |
|                     | PANCHET HPS | 1       | 40          | RGMO detail is n't available  | No response       |
| 2                   |             | 40      |             |   |                   |
| JSEB                | SUBARNREKHA | 1       | 65          | RGMO in place,But due to less availability of water ,RGMO could not tested                  |                   |
|                     |             | 2       | 65          |   |                   |
| OHPC                | BURLA       | 1       | 49.5        | Applied for exemption(56th OCC meeting)   |                   |
|                     |             | 2       | 49.5        |   |                   |
|                     |             | 3       | 24          |   |                   |
|                     |             | 4       | 24          |   |                   |
|                     |             | 5       | 37.5        |   |                   |
|                     |             | 6       | 37.5        |   |                   |
|                     |             | 7       | 37.5        |   |                   |
|                     | CHIPLIMA    | 1       | 24          | Applied for exemption(56th OCC meeting)   |                   |
|                     |             | 2       | 24          |   |                   |
|                     |             | 3       | 24          |   |                   |
|                     | BALIMELA    | 1       | 60          | Applied for exemption(56th OCC meeting)   |                   |
|                     |             | 2       | 60          |   |                   |
|                     |             | 3       | 60          |   |                   |
|                     |             | 4       | 60          |   |                   |
|                     |             | 5       | 60          |   |                   |
|                     |             | 6       | 60          |   |                   |
|                     |             | 7       | 75          |   |                   |
|                     |             | 8       | 75          |   |                   |
|                     | UPPER KOLAB | 1       | 80          | Applied for exemption(56th OCC meeting)   |                   |
|                     |             | 2       | 80          |   |                   |
|                     |             | 3       | 80          |   |                   |
|                     |             | 4       | 80          |   |                   |
|                     | RENGALI     | 1       | 50          | Applied for exemption(56th OCC meeting)   |                   |
|                     |             | 2       | 50          |   |                   |
|                     |             | 3       | 50          |   |                   |
|                     |             | 4       | 50          |   |                   |
|                     |             | 5       | 50          |   |                   |
|                     | INDRAVATI   | 1       | 150         | Applied for exemption(56th OCC meeting)   |                   |
| 2                   |             | 150     |             |   |                   |
| 3                   |             | 150     |             |   |                   |
| 4                   |             | 150     |             |   |                   |
| WBSEDCL             | RAMMAM      | 1       | 12.5        | RGMO detail is n't available  | No response       |
|                     |             | 2       | 12.5        |   |                   |
|                     |             | 3       | 12.5        |   |                   |
|                     |             | 4       | 12.5        |   |                   |
|                     | PPSP        | 1,2,3,4 | 900         | Not yet implemenetd & exemption not applied(56th OCC meeting)                               |                   |
| <b>TOAL CPACITY</b> |             |         | <b>3292</b> |   |                   |

Grid Incidents in the month of January 2011

a) **Disturbance in OPTCL SYSTEM**

**(1) Date & Time of Occurrence:**

05.01.2011, 13:55 Hrs

**(2) Name of the Sub Station/ Generating Station:**

220/132 kV Grid S/S, Tarkera

**(3) Details of Occurrence:**

B-Phase jumper between CT to isolator of 220 kV Tarkera-Bisra Ckt-II snapped at Tarkera S/S pulling out all the 220 kV and 132 kV feeders emanating from Tarkera S/Y at other end resulting no power at 220 kV Tarkera bus.

**At the time of occurrence the disposition of the feeders was as below at Budhipadar**

| <b>Bus I (220 kV)</b>     | <b>Bus II (220 kV)</b> |
|---------------------------|------------------------|
| IB-II& IV                 | Auto-I & II            |
| Raigarh                   | IB-I & III             |
| Korba-II & III            |                        |
| Tarkera-I & II            |                        |
| Katapalli-I & II          |                        |
| Bhushan-I & II            |                        |
| SPS                       |                        |
| VAL-I & II                |                        |
| Basundhara (idle charged) |                        |

**220 kV BUS COUPLER BREAKER STATUS (WHETHER “ON”/ “OFF”):-ON at Budhipadar S/S.**

**Sequence of Trippings with relay indication:**

| Time Hrs | Details of tripping  | Relay indication           |
|----------|--|----------------------------|
| 13:55    | 220 kV Tarkera- Bisra Ckt-II ‘B’ ph CT to isolator jumper snapped at Tarkera S/S. (220 | No tripping at Tarkera S/S |

|       |   |                               |
|-------|---|-------------------------------|
|       | kV Tarkera-Bisra Ckt-I was under S/D since 09:00 hrs)   |                               |
|       | 220 kV Tarkera-Budhipadar Ckt-I & II tripped at Budhipadar end but did not trip at tarkera end. (Prior to tripping 220 kV Tarkera-Rengali SY Ckt-I opened at Tarkera end. 220 kV Tarkera-Rengali SY Ckt-II opened at Renagli SY end.) So Tarkera S/S bus become dead. | D/P, 'Y' ph, 'B' ph, E/F      |
|       | 220 kV Budhipadar-Katapalli Ckt-II tripped at Budhipadar end without any relay indication.  |                               |
| 14:01 | 220 kV Budhipadar –Korba Ckt-II & III tripped at Budhipadar end. ( 220 kV Budhipadar-Raigarh Ckt was under S/D)   | 3 phase Master trip relay.    |
|       | Sterlite unit tripped.  | Due to variation in frequency |
| 14:08 | # 1 at lbTPS tripped  | Under frequency               |
| 14:09 | # 2 at lbTPS tripped  | Under frequency               |
| 14:09 | 7 Nos Units at VAL tripped.   | Under frequency               |

**(4) Relay Indication for Faulted Line/ Transformer/ Bus:**

Bus fault occurred at Tarkera.

**(5) Location and nature of Fault:** 220 kV Tarkera Bus

**(6) PLCC counter readings:** Not applicable

**(7) Analysis:**

Bus fault occurred at Tarkera due to snapping of 'B' phase jumper between CT to isolator of 220 kV Tarkera-Bisra Ckt-II.

**(8) Restoration:**

At 14:15 hrs 220 kV Tarkera-Rengali SY Ckt-I charged and stood OK.

At 14:21 hrs 220 kV Budhipadar-Korba Ckt-II charged.

At 14:24 hrs 220 kV Budhipadar-Korba Ckt-III charged and 220 kV Budhipadar-Katapalli Ckt-I charged.

At 14:25 hrs startup power extended to lbTPS and Burla PH.

At 14:37 hrs 220 kV Tarkera-Rengali SY Ckt-II charged.

At 14:40 hrs 220 kV Budhipadar- Bhusan Ckt-I charged.

At 14:47 hrs 220 kV Budhipadar- Bhusan Ckt-II charged.

At 15:03 hrs 220 kV Budhipadar- VAI Ckt-I charged.

At 15:08 hrs 220 kV Budhipadar- VAI Ckt-II charged.

At 16:13 hrs 220 kV Tarkera-Bisra Ckt-I charged after shut-down work.

At 16:24 hrs 220 kV Tarkera-Budhipadar Ckt-I charged.

At 16:25 hrs 220 kV Tarkera-Budhipadar Ckt-II charged.

At 16:35 hrs 220 kV Budhipadar-Katapalli Ckt-II charged.

At 18:26 hrs 220 kV Tarkera-Bisra Ckt-II charged after repair work.

At 19:55 hrs #1 IbTPS synchronized.

06.01.11

At 07:23 hrs #2 IbTPS synchronized.

#### **Remedial Measures/ Lesson learnt**

|   |
|---|
| Checking of jumpers at Tarkera Grid S/S |
|---|

#### **b) Tripping of 400 KV Farakka – Kahalgaon D/C**

Date & Time of occurrence: 07/01/11 at 05:59 hrs / 07:50 hrs

#### **System condition prior to the incident**

FSTPP Generation 1256 MW

400 KV Farakka – Kahalgaon – I 630 MW

400 KV Farakka – Kahalgaon – II 630 MW

NR Drawl 1824 MW (against Schedule 1024 MW)

WR was under-drawing by 800 MW

KhSTPP Unit No-6(500MW) was under shutdown due to coal shortage

#### **Incidence of events:**

At 06:02 hrs 400 KV Farakka – Kahalgaon –II tripped on R-phase to ground fault, zone-1,18km from Kahalgaon end (Micom relay).Breaker was also opened at Farakka end(MAIN I -RANZA 99%,MAIN II - LZ 96; D; R & S). After tripping of ckt-II, flow in 400 KV Farakka – Kahalgaon –I shoot up to 950 MW. FSTPP generation was backed down up to technical minimum 1077MW.Export to SR was increased by around 200 MW. Export from WR was also reduced by around 400 MW. NRLDC also took action to reduce drawal by around 200 – 250 MW initially and reduced by 600 MW thereafter by carrying out load-shedding in the states of Punjab, Rajasthan and picked up hydro generation. 400 KV Farakka – Kahalgaon –I load reduced to 650MW

At 07:07 hrs charging code for the 400 KV Farakka – Kahalgaon – II issued (code-117).

At 07:52hrs 400KV Farakka – Kahalgaon –II was charged from Kahalgaon end tried to synchronize at Farakka but breaker closed and tripped on pole discrepancy at Farakka. At Kahalgaon end current recordings (at MICOM relay of 400 KV Farakka – Kahalgaon – II line) - while synchronizing the 400 KV Farakka – Kahalgaon – II was 1062 / 90 / 1087.400KV Farakka – Kahalgaon –I also got tripped at Kahalgaon on earth fault protection (MICOM relay recording at Kahalgaon end is 684 / 1028 / 694). Both 400 KV Farakka – Kahalgaon –I & 400 KV Farakka – Kahalgaon – II were in hanging condition with 400 KV Farakka – Kahalgaon –I charged from Farakka end & 400 KV Farakka – Kahalgaon – II charged from Kahalgaon end. Backing down at Mejia Thermal Power Station (50MW) was done to reduce over-loading of 220 kV Mejia-Kalyaneswari S/C of DVC.

At 07:56hrs 400 KV Farakka – Kahalgaon – II was charged from Kahalgaon end synchronized at Farakka but it got tripped on E/F (Micom relay:IR/IY/IB:1171.9/90.119/1202A & IN-826A)) at Kahalgaon. The breaker at Farakka got closed and tripped on pole discrepancy & CVT fuse fail annunciation was also appeared.

At 08:06hrs 400 KV Farakka – Kahalgaon –I was tried to charge from Farakka end synchronize at Kahalgaon but got tripped from Farakka end and it remained charged at Kahalgaon.Relay indications at Farakka end are MAIN-I RANZA 00%;RAZFERN,U,2Ø,3Ø,Z1 & Z2.MAIN-II LZ 96;R & S. Due to high bus voltage at Kahalgaon 400 KV Farakka – Kahalgaon –I was opened manually from Kahalgaon.

### **Restoration**

400 KV Farakka – Kahalgaon-1was restored at 09:58 hrs.

400 KV Farakka – Kahalgaon-2was restored at 09:59 hrs

### **c) Trippings at 400/220/132 KV Malda (POWERGRID) S/s.**

Date & Time of occurrence: 08/01/11 at 05:10 hrs

### **Pre disturbance condition Conditions:**

|                               |                     |
|-------------------------------|---------------------|
| System Frequency              | 49.94 Hz @ 05:00Hrs |
| 400KV MALDA - FARAKKA- I & II | 170MW (each)        |
| 220KV MALDA DALKHOLA I & II   | 140MW               |

|                           |      |
|---------------------------|------|
| 132KV MALDA-WBSETCL- I    | 32MW |
| 132KV MALDA- WBSETCL - II | 28MW |

**Incidence of events:**

At 05:10 hrs fault occurred at Location no. 229 in 220KV Malda-Dalkhola-II. 315 MVA ICT III & V cleared the fault under B/U protection since main relay(Main-II, MDT-45, R Y & B) of 220KV Malda-Dalkhola-II failed to operate from Malda end. For 315MVA ICT-III relay indications are Main-I, 67B 67N (220KVside) & for 315MVA ICT-V relay indications are Main-I, 67R & 67N (220KV side).However both 315 MVA ICTs were under charged condition from HV side. 220KV Malda-Dalkhola-II also tripped from remote end (Dalkhola) (Main-II, C-N Z1).

**Restoration:**

315MVA ICT V was taken into service at 05:30 hrs.  
315 MVA ICT-III was taken into service at 05:32hrs.  
220KV MLD-DLK-I was taken into service at 06:12 hrs  
220KV MLD-DLK-II was taken into service at 15:25 hrs

**d) Trippings at 400/220/132 KV Malda (POWERGRID) S/s.**

Date & Time of occurrence: 08/01/11 at 15:35 hrs

**Pre disturbance condition Conditions:**

System Frequency – 49.75 MW  
Farakka STPP Generation 1525 MW  
Kahalgaon STPS - I & II Generation 1190 MW  
400 KV Farakka – Kahalgaon – I ( 690 MW)  
400 KV Farakka – Kahalgaon – II (each Ckt)  
NR Drawl 1930 MW (against Schedule 1738 MW)  
WR Injection 620 MW (against Drawl Schedule of 273 MW).  
220 KV Malda – Dalkhola – I (175 MW each Ckt from  
220 KV Malda- Dalkhola – II Malda towards Dalkhola)  
400 KV Farakka – Malda –D/c – 220 MW per ckt.  
400/220 KV ICT- III & V, 220/132 KV ICT-I, II & IV were in service.

**Incidence of events:**

At 15:35 hrs, jumper snapping at 220 KV side of 315MVA ICT-III at Malda (PG) caused 220 KV Bus fault leading to outage of 220 KV Malda Dalkhola D/C and all the ICTs{400/220 2Nos ICT & 220/132 3Nos ICT) at Malda S/s. For 315MVA ICT-III & V relay indications are Main-I, 67R & 67N (400KV side). Load affected at Malda, Gangarampur, Balurghat & Samsi in West Bengal. 400 KV Farakka – Kahalgaon D/c loading increased to 800 MW per circuit making system more vulnerable.

**Corrective Actions Taken:**

Farakka STPP was asked for immediate backing down of 180 MW and passing of 200 MW UI to SR.

**Restoration:**

315 MVA ICT-V at Malda was restored at 15:56 Hrs as 400 KV Malda – Farakka –D/c was already charged from Farakka end. Later, Power extended to WBSEB system.

220 KV Malda – Dalkhola –I was taken in service at 16:02 Hrs.

220 KV Malda – Dalkhola –II was taken in service at 18:23 Hrs.

315 MVA ICT-III at Malda was restored at 18:14 Hrs

**e) REPORT ON THE 220 KV MAIN BUS -1 FAILURE AT KALYANESWARI S/S OF DVC AT 06:05 HRS OF 26-01-11**

**Incident**

At around 06:05 hrs of 26-01-11 B-Ph CT of 220KV L # 204 (Kalyaneswari-CTPS) bursted and the incident kcaused fire in the Switchyard

**Bus Orientation before the occurrence (220 KV):**

|           |        |         |
|-----------|--------|---------|
| L # 203   | MB # I |         |
| L # 204   | MB # I |         |
| L # 228   | MB # I |         |
| L # 229   |        | MB # II |
| ATR # I   |        | MB # II |
| ATR # II  | MB # I |         |
| L # 217   | MB # I |         |
| L # 218   |        | MB # II |
| ATR # III | MB # I |         |
| L # 237   |        | MB # II |

|         |        |  |
|---------|--------|--|
| L # 238 | MB # I |  |
|---------|--------|--|

**Tripping Details:**

| Line No.                 | Tripping at Kalyaneswari end                            | Tripping at other end        |
|--------------------------|---|------------------------------|
| L # 203<br>(CTPS-KLN):   | 96 (2T), Bus diff. protection charged only from KLN end |                              |
| L # 204<br>(KLN- CTPS):  | 21A, C SOTF L/O & 96 (2T) & L/O Relays                  | YTG (CA, AB, BA Zone-2 & L/O |
| L # 228<br>(KLN- MTPS):  | 96 (2T) Bus diff.protection                             | 21 (A) & L/O Relays          |
| L # 229                  | No Tripping   | No Tripping                  |
| ATR - I                  | HV & LV 51 AX O/C                                       | --                           |
| ATR – II                 | 96 (2T) Bus diff.protection                             | --                           |
| ATR - III                | 96 (2T) Bus diff.protection                             | --                           |
| L # 217<br>(KLN- PGCIL): | 96 (2T) Bus diff.protection                             | --                           |
| L # 218<br>(KLN- PGCIL): | No Tripping   | No Tripping                  |
| L # 237<br>(KLN- PGCIL): | No Tripping   | No Tripping                  |
| L # 238<br>(KLN- PGCIL): | 96 (2T) Bus diff.protection                             | --                           |
| Bus Tie                  | 87 CHA, 87 (AB, AC) 96 (2T)                             | --                           |

The following 132 KV lines were made off manually:

- (i) L # 18 (KLN- Kalipahari):
- (ii) L # 19 (KLN-Kalipahari):
- (iii) L # 68 (KLN-MHS): Tripped

- (iv) L # 69 (KLN-MHS)
- :
- (v) 50 MVA and 31.5 MVA 132/33 KV Transformer

**Normalisation:**

ATR # I : 07:03 hrs  
ATR # II : 07:24 hrs  
Bus Tie : 07:10 hrs  
L # 238 : 07:14 hrs  
L # 228 : 07:19 hrs  
ATR # I : 07:24 hrs

132 KV L # 68 07:33 hrs  
L # 69 07:29 hrs  
L # 18 07:42 hrs  
L # 19 07:42 hrs  
31.5 MVA Trx 07:07 hrs  
50 MVA Trx 08:25 hrs

**Remarks**

Bursting of 220 KV CT of L # 204 ultimately created Bus fault at 220 KV MB-I. All the lines and equipments on MB-I tripped through Bus diff. protection along with 220 KV Bus Tie Breaker thereby causing TPF at 220 KV MB-I of KLN S/S.

220 KV L # 204 (KLN-CTPS) normalized using the bay of L # 203 (KLN-CTPS) on 29-01-11 by jumpering line 203 & 204 at suitable location [L # 203 is under long S/D for its termination at CTPS Ph-II Switchyard