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भारतसरकार

Government of India

उत्तर क्षेत्रीय विद्युत समिति

Northern Regional Power Committee

-18ए ,शहीद जीतसिंह मार्ग ,कटवारिया सराय, नई दिल्ली110016 -

18-A, Shaheed Jeet Singh Marg, KatwariaSarai, New Delhi-110016

NRPC/OPR/109/01/2013/221-224 दिनांक :01.03.2013

To,

The Secretary
Central Electricity Regulatory Commission
New Delhi

Subject:-Submissions of NRPC Secretariat in Petition No. 265/MP/2012

Sir,

In compliance to directions of Hon'ble Commission contained in Record of Proceedings for hearing dated 10.01.2013 in aforesaid petition, submissions of NRPC are enclosed.

Yours faithfully,

Sd/-
(P.K.Pahwa)
Member Secretary

Copy to:

1. CMD,
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   Gurgaon-122001 (Haryana)

2. CEO, POSOCO
   B-9, Qutab Institutional Area
   Katwaria Sarai, New Delhi-110 016

3. Chief Engineer (Grid Management)
   Central Electricity Authority,
   Sewa Bhawan, R.K. Puram,
   New Delhi – 110066

Submissions of NRPC in Petition No 265/MP/2012 regarding - (i) Autimatic Demand Management Scheme and (ii) Grid Security Expert System

The Record of Proceedings in petition No 265/MP/2012 for hearing held on 10.01.2013 contained following directions of Hon'ble Commission:

> *"The Commission observed that in Petition Nos. 249, 250 and 265/MP/2012, Regional Power Committees of all regions have been directed during the hearing on 8.1.2013 to discuss the issue of "Implementation of the Automatic Demand Management Scheme at the SLDC/distribution company level" as an agenda item within one month and file their decisions.*
>
> *The Commission directed that the Regional Power Committees of all regions would also take up to issue of 'Implementation of Grid Security Expert System' as an agenda item within one month from the date of issue of this ROP and file their decisions on affidavit within one week thereafter, after serving the copies thereof on all the constituents of the respective RPC".*

2. The issue of Grid Security Expert System (GSES) was initially discussed in the 81st OCC meeting held on 20th November, 2012. During the meeting NTPC, NHPC and SLDC's had expressed prima facie reservations about automatic reduction in generation. Relevant portion of minutes of this OCC meeting is enclosed at Annex-I. This issue was also subsequently discussed in the 27th NRPC meeting held on 30th November, 2012 wherein it was decided that POSOCO will convene a separate meeting so that constituents have clarity on the proposal as well as to remove any doubts. A copy of the relevant portion of the minutes of this meetings is enclosed at Annex-II.

3. The scheme was again discussed in the 83rd OCC meeting of NRPC held on 17th January, 2013 wherein POWERGRID made a presentation on GSES including the ten numbers of scenarios when the power system would be under stress. During this OCC meeting it was decided that all constituents will send their written observation/ comments on GSES to NRPC Secretariat latest by 31.01.2013. Minutes of meeting is enclosed at Annex-III.

4. Subsequently, in compliance to the directions of Hon'ble Commission, a special meeting was called on 07.02.2013 to discuss twin issues of GSES and Automatic Demand Management Scheme. During this meeting there was no consensus on some of the provisions in GSES (Minutes of meeting enclosed at Annex-IV). Based on the observations during the meetings and subsequent comments received consolidated views on GSES as under:

5. Views of the constituents on GSES

(i) The report prepared by POSOCO envisages automatic generation reduction in case of Over-injection/Under-drawal. Generating companies as well as SLDCs were not in favour of automatic generation reduction. In this regard it was clarified by POSOCO that in case reduction in generation is required, to

begin with only annunciation will be provided in generating station's control room and operator will manually reduce generation. Some of the constituents were of the view that same can be achieved through message and there was no need of GSES for this purpose.

(ii) Automatic Demand Management System and GSES are similar. Implementing both the schemes independently would lead to duplication and avoidable expenditure.

(iii) With regard to the load shedding to control overdrawal some of the constituents were of the view that if load shedding is carried out through GSES, a distribution company which was complying with intra-State schedule may get affected.

(iv) Some of the proposals in the report prepared by POSOCO are not in conformity with the existing regulatory provisions.

(v) Distributing Companies of Delhi were of the view that the already designed defence mechanism and safeguards are sufficient for the system. There is need is to improve the compliance and maintain the existing infrastructure properly instead of creating a new grid security mechanism with huge expenditure.

(vi) Some of constituents were of the opinion that some of the modules of GSES viz. UFR, df/dt, Islanding Schemes are part of the existing system. These is a need to dovetail these in the GSES.

6. **The Status Automatic Demand Management System**: The status of Automatic Demand Management System as obtained in the meeting held on 07.02.2013 is as under:

(i) Delhi: Automatic Demand Management has been implemented in Delhi system.

(ii) Haryana: The two distribution companies in Haryana are in the process of installing their SCADA system. It was infomred that the issue of Automatic Demand Management System is under discussion between SLDC and Discoms.

(iii) Punjab: The issue is under preliminary discussions between PSTCL and PSPCL.

(iv) Rajasthan: A committee has been constituted.in Rajasthan for Automatic Demand Management.

(v) Uttar Pradesh: U.P, SLDC has advised Distribution Companies to set up their own Control Rooms for Automatic Demand Management. Noida Power Company in Noida has established the Control Room and Automatic Demand Management system is in place.

(vi) Uttarakhand: Draft scheme for Automatic Demand Management Scheme has been formulated by SLDC and certain information has been sought from Distribution licensee namely UPCL.

(vii) J&K: Information has not been submitted to NRPC Secretariat.

(viii) Chandigarh: Information has not been submitted to NRPC Secretariat.

7. The written comments on GSES and status of Automatic Demand Management received from various constituents is enclosed.

Annex- I

Relevant extract of 81st OCC meeting held on 20th November, 2012.

out so far. He stated that this would enable constituents to take precautionary steps during ensuing foggy season. Representative of POWERGRID assured to submit the same by 26.11.2012.

(ii) In the 67th OCC meeting, it was intimated that notifications by Food & Civil Supply Departments of Punjab, Haryana and Himachal Pradesh were available and were appended to the report of Enquiry committee constituted by CEA for disturbance of 2007. These notifications stipulated banning of new brick kilns within the stipulated distance from EHV transmission lines. Haryana, HPSEB Ltd. and Punjab have confirmed enforcement of notifications by their Food & Civil Supply Department in previous meetings. BBMB have also confirmed in the 73rd OCC meeting that there were no brick kilns within stipulated distance from EHV transmission lines of BBMB in Haryana, Punjab & Himachal Pradesh. Although, there is no statutory provision in Rajasthan to ban such brick kilns or industrial units, representative of RRVPNL had intimated in the 76th meeting, that the issue has been taken up with the Govt. of Rajasthan. Representative of UPPTCL had intimated that the issue was yet to be taken up with the Govt. and Representative of PTCUL had intimated that the issue has already been taken up with the Govt and was being pursued. He added that as decided in the 77th OCC meeting held on 20th July, 2012 this issue is being put up to NRPC in the forthcoming meeting scheduled for 30th November,2012. However, he requested RRVPNL, UPPTCL and Uttrakhand to intimate if there is any progress in the matter. No progress was reported on the subject.

8. Grid Security Expert System (GSES).

Representative of POWERGRID stated that subsequent to the recent Grid Disturbance of 30th and 31st July 2012, a meeting was held on 06th August 2012 between Union Power Minister of India with Chief Ministers/Power Ministers of States of Northern Region and a 12 point resolution was drawn to ensure that such type of incidents do not occur in future. The points pertaining to defense plans are as follows:-

Point No. 1: Adequate defence plans and protection system shall be put in place to ensure integrated operation of the National/ Regional Grids in adherence with the Indian Electricity Grid Code [IEGC]. All the states shall ascertain preparedness of power system defence plans and cooperate at the Regional level for coordinating their Protection systems.

Point No. 2: Defence plans of the states must include islanding schemes, under frequency relays, rate of change of frequency relays, special protection schemes and automatic demand management schemes. The defence plans shall also include restoration procedures that shall be updated and reviewed regularly.

Point No. 11: POSOCO would evolve a contingency load shedding protocol, especially when non frequency related load shedding is required."

He added that accordingly POSOCO has prepared a template for ten number of scenarios when the power system would be under stress along with the substation and feeder details. The same was communicated by POSOCO vide letter dated 11th September 2012 to CEA with a copy to POWERGRID/RPCs/CERC for automated defense plan for all five regions. (Summary of the scheme had been given in Annexure-III attached to the agenda notes).

Based on the above inputs, POWERGRID has planned an automated defense plan for all five regions named as Grid Security Expert System (GSES). The brief details of the GSES system have been given in Annexure-IV **attached** to the agenda notes.

The implementation of the above scheme has been proposed through following projects:-

1. **GSES system**: *This would involve the installation of relays, PLCs etc at Substation/Generating station level and advance GSES Software at all SLDCs and RLDC. The list of feeders where the relays shall be put has been proposed by RLDC and is proposed to be monitored in the Centralized GSES system at SLDCs. The logics for operation of the above relays shall be finalized by RLDC/RPC in consultation with SLDCs. As per this plan, the automated feeder disconnection has been proposed at 287 No. Substations in Northern Region.*

2. **Communication System for GSES system**:- This would require dedicated and reliable communication system. Accordingly Fiber Optic based Communication from Substations to SLDCs/RLDC has been proposed.

Further, he added that the details for each state in **Northern Region** including estimated cost have been indicated in Annexure-IV attached to the agenda notes. He requested members to approve the automated defense plan.

After discussing the proposed automated defense plan prepared by POSCO, members expressed following views:

(i) Automated actions for conditions mentioned at Sl. Nos. 1, 4. 5. 6 and 7 of Annex-III of the agenda were found to be in order.

(ii) Automated action at Sl. No. 3 of Annex-III of the agenda for automatic under voltage load shedding in combination with relief from under-voltage relay was also found to be in order. However, threshold voltage below which load shedding will start needs further deliberation.

(iii) Monitoring of relays under Sl. Nos. 8 (UFR), 9 (df/dt) and 10 (islanding scheme) of Annex-III of the agenda were found to be in order but settings will have to be as approved by NRPC.

(iv) NTPC, NHPC as well as SLDCs expressed prima facie reservation about automatic generation reduction in accordance with automated action at Sl. No. 2 of Annex-III of the agenda. It was agreed that detailed report prepared by POSCO will be uploaded on NRPC web-site and members will give written observations by 27th November, 2012.

9. Activation of Auto-Reclosure and Installation of Fault Locators in 220 kV Lines emanating from RAPP-Kota.

Representative of POWERGRID stated that the issue of activation of Auto-Re-closure in 220 kV Lines emanating from RAPP Kota-end was discussed in all NRPC forums looking into the problem of tripping of lines on transient faults as well as no fault location data was available due to non-availability of fault locators in aforesaid lines. Great difficulty is faced in routine O&M of said lines because of non-auto re-close of lines as well as non-availability of fault location data on transient fault/ tripping of lines. It also takes a lot of time in identification of fault in case of insulator de-capping as identification of fault itself takes one to two days and subsequently restoration of line also takes a day, leading of prolonged outage of lines in case of any disturbance.

He added that the issue was discussed in many OCC and subsequently in NRPC forums and finally in the 24th NRPC meeting held on 17.11.2011, NPCIL had agreed to commission auto re-

some of the machines, tuning was done long back that too subsequent to commissioning. He suggested that all ISGS should tie up with OEMs for tuning of PSS at the generating units. Since, PSS tuning will require shutting down/ startup of the machine, Member Secretary, NRPC suggested involvement of NRLDC in this exercise.

B.14.3 Representative of NHPC stated that they would send the report of PSS tuning last time carried out at NHPC stations. Representative of NPCIL desired that NRPC should coordinate PSS tuning at all generating stations within the region. SE (O), NRPC pointed out that in accordance with provisions of IEGC, PSS tuning was primarily the responsibility of generator. However, NRPC would coordinate schedule of PSS tuning.

B.14.4 Representative of POWERGRID stated that PSS tuning could be got done either from OEM or from a consultant. SE (O), NRPC stated that as per his information PSS tuning in Western Region was done with the assistance of IIT, Bombay. Representative of KW HPS stated that they had recently carried out PSS tuning of their units after oscillations were observed in the month of August 2012. In response to a request, he agreed to make a presentation on this issue in the OCC.

B.14.5 TCC recommended that since PSS tuning was the responsibility of generators in accordance with provisions of IEGC:

(i) Karcham Wangtoo HPS will share their experience of PSS tuning with NRPC constituents in the OCC meeting.
(ii) All generating companies will tie up with OEM or a technical consultant to carry out PSS tuning
(iii) Readiness for PSS tuning along with period in which they intend to carry out this exercise will be intimated to CTU and NRPC within 2 months
(iv) Schedule for PSS tuning will be finalized in the OCC as it involved unit shutdown
(v) After PSS tuning, generating companies will submit results of step response test to NRLDC, CTU and NRPC

NRPC Deliberations.

B.14.6 Members of NRPC took note of the deliberations in TCC.

B.15 Grid Security Expert System (GSES)

TCC Deliberations.

B.15.1 Giving a brief background, representative of POWERGRID stated that subsequent to the recent Grid Disturbance of 30th and 31st July, 2012, a meeting was held on 06th August, 2012 between Union Power Minister of India with Chief Ministers/Power Ministers of States of Northern Region and a 12 point resolution was drawn to ensure that such type of incidents do not occur in future. The points pertaining to defence plans were as follows:

Point No. 1: Adequate defence plans and protection system shall be put in place to ensure integrated operation of the National/ Regional Grids in adherence with the Indian Electricity Grid Code [IEGC]. All the states shall ascertain preparedness of power system Defence plans and cooperate at the Regional level for coordinating their Protection systems.

Point No. 2: Defence plans of the states must include islanding schemes, under frequency relays, rate of change of frequency relays, special protection schemes and automatic demand management schemes. The Defence plans shall also include restoration procedures that shall be updated and reviewed regularly.

Point No. 11: POSOCO would evolve a contingency load shedding protocol, especially when non frequency related load shedding is required.

He added that POSOCO had accordingly prepared a template for ten numbers of scenarios when the power system would be under stress along with action to be taken automatically to overcome the situation. The same was communicated by POSOCO vide letter dated 11th September, 2012 to CEA with a copy to POWERGRID, RPCs and CERC for automated Defence plan for all five regions. (Summary of the scheme was attached at Annexure-X to the agenda notes).

Based on the above inputs, POWERGRID had planned an automated Defence plan for all five regions named as Grid Security Expert System (GSES). The brief details of the GSES system were enclosed at Annexure-XI to the agenda notes).

Further, he added that the implementation of the above scheme was proposed through following projects:-

1. GSES system: This would involve the installation of relays, PLCs etc at Sub-station/Generating station level and advance GSES Software at all SLDCs and RLDC. The list of feeders where the relays shall be put has been

proposed by RLDC and is proposed to be monitored in the Centralized GSES system at SLDCs. The logics for operation of the above relays shall be finalized by RLDC/RPC in consultation with SLDCs. As per this plan, the automated feeder disconnection has been proposed at 287 Nos. Sub-stations in Northern Region.

2. Communication System for GSES system:- This would require dedicated and reliable communication system. Accordingly Fiber Optic based Communication from Sub-stations to SLDCs/RLDC has been proposed.

The details for each state in Northern Region including estimated cost have been indicated in Appendix-II to the agenda notes. He requested members to deliberate the same.

B.15.2 Member Secretary, NRPC intimated that the scheme was discussed in OCC where members had sought some more time to study the scheme. Accordingly, the report prepared by POSOCO is being uploaded on NRPC website. Representative of RRVPNL stated that the details of the scheme provided so far only indicates operating logic of the scheme but States would like to know as to how this logic will be implemented particularly mechanism by which, NRLDC will disconnect 132 kV feeders in the states. He also requested POWRGRID to elaborate on the system where such scheme has been implemented and what has been operational experience. Representative of HVPNL stated that any such scheme should be in conformity with regulatory provisions but taking over of control of STU and DISCOM feeders by NRLDC amounts to bypassing statutory powers of SLDCs. Representative of TPDDL stated that as per grid code, each state has to have State-of-the-art load management system and the proposed scheme by POWEREGRID was over and above that. He pointed out that within a state, one distribution company may be overdrawing but others may be well within their schedule. He desired that in such a situation, the scheme proposed by POWERGRID should not lead to load shedding in command area of disciplined DISCOM. Representative of POWERGRID clarified that the load shedding will be automatic with the provision of action to be taken by SLDCs in the first instance failing which, NRLDC will take over the control.

B.15.3 Members of TCC were of the view that with the details made available so far, there is not enough clarity regarding mechanism of implementation. Therefore, TCC recommended that POSOCO should convene a separate meeting on this issue where complete details of the scheme should be shared with constituents of Northern Region**.**

NRPC Deliberations.

B.15.4 NRPC concurred with the recommendation of TCC.

B.16 Proposal for implementation of state of art PABX system

TCC Deliberations.

B.16.1 Giving a brief background, representative of POWERGRID stated that during the recent grid disturbance, operators at control centres faced many problems in voice communication with other control centers and important stations due to non-availability of fast dialing, easy directory sorting and inter-Regional voice connectivity etc. which consequently delayed the grid restoration process. Considering this, POWERGRID had proposed to install state-of-the-art PABX system at all SLDCs, RLDCs and NLDC of the country with features such as computerized touch screen dialing, directory sorting, voice recording system etc. The proposal for inclusion of state-of-art PABX system for NLDC/NRLDC & all SLDCs of Northern region under the ongoing Fiber Optic Project for Northern Region was deliberated and agreed to in 33rd USMG meeting. Subsequently, the proposal was also recommended by OCC in its 81st meeting held on 20.11.2012. The NIT for this requirement had already been floated and bids were scheduled for opening in the month of November, 2012.

B.16.2 TCC recommended proposal of POWERGRID for approval of NRPC.

NRPC Deliberations.

B.16.3 NRPC concurred with the recommendation of TCC.

B.17 Opening of EHV lines of Schedule A & B of Haryana by NRLDC, POSOCO, New Delhi.

TCC Deliberations.

B.17.1 Giving a brief background, representative of HVPNL stated that EHV lines covered under Schedule A & B of Haryana were being got opened frequently by Shift Charge Engineer/NRLDC, POSOCO, New Delhi through BBMB even on the momentarily over drawl by Haryana from the grid. Since Haryana was also simultaneously taking action to control over-drawl, the opening of these lines by NRLDC results into heavy under drawl by Haryana which persists for a long time. In such scenarios Haryana was forced to under draw (deviate from its CGS Schedule), due to undesirable action by NRLDC.

Annex-III

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No. : उ. क्षे. वि. स./प्रचालन/106/2012/ दिनांक: 28.01.2013

To : Members of Operation Co-ordination Sub-Committee

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SCL	Sh. Amarjeet Singh, Addl. General Manager, Fax N0. 011-23370499.
PTCI	Sh.Rajib K.Mishra, Executive Director/ Sh.Harish Saran ,Ex. Vice President, Fax No. 011-41659144

SUBJECT: Abstract of decisions taken in the 81st OCC Meeting.

विषय: : प्रचालन समन्वय उपसमिति की 79 वीं बैठक।

The 83rd OCC Meeting of NRPC was held on 17th January, 2013 at NRPC Secretariat, New Delhi gist of discussions during the OCC meeting on the issue of "Grid Security Expert System (GSES)" have been hosted on the NRPC's web-site. The same can be downloaded from http://nrpc.gov.in.

Sd/-
(Ajay Talegaonkar)
SE (Operations) & Member Convener, OCC

Gist of discussions during the OCC meeting held on 17th January, 2013 on the issue of "Grid Security Expert System (GSES)".

1. Giving a brief background, representative of POSOCO stated that subsequent to the Grid Disturbance of 30th and 31st July 2012, a meeting was taken on 06th August 2012 by Union Power Minister of India with Chief Ministers/Power Ministers of States of Northern Region, wherein a 12 point resolution was drawn to ensure that such type of incidents do not occur in future. Point No. 11 pertaining to defense plans stipulated that "POSOCO would evolve a contingency load shedding protocol, especially when non frequency related load shedding is required." He further stated that based on the template prepared by POSOCO for ten number of scenarios when the power system would be under stress, POWERGRID has planned an automated defense plan for all five regions named as Grid Security Expert System (GSES).

2. Member Secretary, NRPC stated that the issue was discussed in the 81st OCC meeting held on 20th November, 2012, whereinNTPC, NHPC as well as SLDCs hadexpressed prima facie reservation about automatic generation reduction in accordance with automated action. The issue was further discussed in the 27th NRPC meeting held on 30th November, 2012 wherein it was decided that POSOCO will convene a separate meeting with all constituentsso that constituents have the clarity on the proposal as well as to remove any doubts that they may have. The issue had come up for discussion in the meeting taken by Additional Secretary, Ministry of Power on 12th January, 2013, wherein it was decided that this issue should be taken up in the OCC meeting scheduled on 17th January, 2013. Accordingly, this item was included as additional agenda for the meeting.

3. Representative of POSOCO drew attention of members towards the Record of Proceedings (ROP) of CERC dated 10.01.2013 in Petition No. 265/MP/2012. For the benefit of the members he read out relevant extract of ROP as under:

> *"The Commission observed that in Petition Nos. 249, 250 and 265/MP/2012, Regional Power Committees of all regions have been directed during the hearing on 8.1.2013 to discuss the issue of "Implementation of the Automatic Demand Management Scheme at the SLDC/distribution company level" as an agenda item within one month and file their decisions.*
>
> *The Commission directed that the Regional Power Committees of all regions would also take up to issue of 'Implementation of Grid Security Expert System' as an agenda item within one month from the date of issue of this ROP and file their decisions on affidavit within one week thereafter, after serving the copies thereof on all the constituents of the respective RPC".*

4 Representative of POWERGRID made a detailed presentation on GSES including the ten number of scenarios when the power system would be under stress and added that the implementation of the above scheme has been proposed through following projects:-

1. **GSES system**: *This would involve the installation of relays, PLCs etc at Substation/Generating station level and advance GSES Software at all SLDCs and RLDC. The list of feeders where the relays shall be put has been proposed by RLDC and is proposed to be monitored in the Centralized GSES system at SLDCs. The logics for operation of the above relays shall be finalized by RLDC/RPC in consultation with SLDCs. As per this plan, the automated feeder disconnection has been proposed at 287 No. Substations in Northern Region.*

2. **Communication System for GSES system**:-This would require dedicated and reliable communication system. Accordingly Fiber Optic based Communication from Substations to SLDCs/RLDC has been proposed.

5. Representative of POSOCO intimated that the estimated cost of the scheme for Northern Region is about Rs. 224 crores. Out of this, around 2/3 would be for communication network and 1/3 would be for installation of relays, PLCs etc at Substation/Generating station level and advance GSES software at all SLDCs and RLDC. Estimated time of completion was intimated as 30 months after the approval by CERC.

6. S.E.(O), NRPC stated that some states like U.P. have ordered large number of Under Frequency Relays (UFR) and df/dt relays. He enquired as to whether these relays would be compatible with requirement of GSES. Representative of POWERGRID confirmed that UFR and df/dt relays of Numerical type can be dovetailed into GSES. In response to another query, he informed that cost recovery model for GSES would be on the lines of ULDC scheme.

7. In response to a query about the role of SLDC in system operation after the implementation of GSES system, representative of POSOCO explained that the proposed system shall have facility of automatic operation of the scheme as per provision of the Grid Code and command execution shall be done automatically from SLDCs only. Representative of POWERGRID further explained that the command shall be executed by RLDC only as a backup if the scheme failed to operate from SLDC. However, RLDC system shall send the signals to SLDC system in case of TTC violation, Inter-Regional , major tie-line flow violation, angle violations which might not be critical for SLDC but might be critical for Regional or national Grid and command again has to be executed by SLDC only. Representative of POWERGRID stated that the Scheme shall have the provision of the modification of the logics depending upon the system requirements and the regulatory provisions.

8. On a query from representative of NTPC, representative of POSOCO confirmed that GSES as envisaged presently would be based on automated load shedding and generation control in the SLDC control areas. No Central Sector Generators have presently been considered for reduction in generation under GSES. Representative of POSOCO explained that the scheme would send the signal to the generator and the Generator shall use the signal to implement the scheme so that the necessary relief to the grid could be immediately available. Further, as emergency measure the signal might be used for backing down of generation and in

case of SPS schemes, the central sector/IPP generating stations might also be included.

9. Representative of NTPC stated that they were aware of the direction of CERC in ROP dated 10.01.2013 and were framing their reply which would be submitted to CERC and a copy of the same will be furnished to NRPC also.

10. Member Secretary, NRPC enquired as to whether such kind of scheme has been implemented anywhere in the world. Representative of POWERGRID informed that as per information available with them, such kind of system has not been implemented so far, however, it is worldwide practice to have the Automatic Governor Control and Area Control Error feedback implemented in the system.

11. Representative of POSOCO informed the members that they should thoroughly go through the list of feeders and generators proposed under this Scheme and send their comments as per their operational experience. The data contained in the report submitted to CEA and uploaded on the web site of NRPC has been compiled based on the data available with NRLDC and keeping in mind that the same load group should not be affected always to avoid blackout at some pockets for longer duration.

12. It was decided that all constituents will send their written observation/ comments on GSES to NRPC Secretariat latest by 31.01.2013. If required, aseparate meeting would be convened after receipt of observation/ comments.

Annex-IV

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seonrpc@yahoo.in

भारत सरकार

Government of India

उत्तर क्षेत्रीय विद्युत समिति

Northern Regional Power Committee

18-ए शहीद जीत सिंह मार्ग, कटवारिया सराय, नई दिल्ली- 110016

18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016

No. NRPC/OPR/106/01/2013/ दिनांक: 28.02.2013

To,

Members of NRPC
(As per list Attached)

Subject : Meeting to finalise the views of NRPC on (i) Grid Security Expert System (GSES)" and to (ii) discuss Automatic Demand Management Scheme .

In compliance to directions of Hon'ble CERC, a meeting was held on Thursday, the 07th February, 2013 at NRPC Secretariat, New Delhi on the above subject. Minutes of this meeting have been uploaded on NRPC website (www.nrpc.gov.in). This is for your kind information.

Yours faithfully,

Sd/-
(P.K.Pahwa)
Member Secretary

List of NRPC Members

1. Sh. Alok Kumar, IAS, CMD, UPPTCL and Chairperson, NRPC, Lucknow-226001, (Fax-0522-2287792)
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3. Sh. A.B. Agrawal, Chairman, BBMB, Chandigarh-160019, (Fax-0172-2549857/2652820)
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6. Sh. Shakti Sinha, Chairman & Managing Director, DTL, New Delhi-110002, (Fax-011-23234640)
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8. Sh. P.K. Gupta, General Manager (SLDC), DTL, New Delhi-110002, (Fax-011-23221069)
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12. Sh. Devender Singh, CMD, Uttar Haryana Bijli Vitaran Nigam Ltd., Panchkula, (Fax-0172-3019100)
13. Sh. V.K. Kaprate, Director (Plg. & Contracts), HPPTC Ltd, Shimla-171004, (Fax-0177-2626284)
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29. Sh. S.K. Soonee, CEO, POSCO, New Delhi-110016, (Fax-011-26560190)
30. Sh. V.V. Sharma, GM, NRLDC, New Delhi-110016, (Fax-011-26853082)
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32. Sh. I.J. Kapoor, Director (Commercial), NTPC, New Delhi-110003, (Fax-011-24368417)
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36. Sh. Praveer Sinha, CEO, Tata Power Delhi Distribution Ltd. New Delhi-09, (Fax-66112435)
37. Sh. Raj Kumar Roy, Director, Lanco Anpara Power Ltd. (Fax-124-2341627)
38. Sh. Asim De, Project Director, Rosa Power Supply Company Ltd. , (Fax-022-30387502)
39. Sh. M.K. Singhi, Executive Director, Shree Cements Ltd, Beawar (Fax-01462-228117/228119)
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41. Sh. S.N. Goel, Director(Mktg. & Opn.), PTC India Ltd, New Delhi, (Fax-011-41659144)

Summary record of Discussions of the Meeting to finalise the views of NRPC on (i) Grid Security Expert System (GSES)" and to (ii) discuss Automatic Demand Management Scheme held on 07.02.2013.

List of participants is enclosed as **Annexure-I.**

Welcoming the participants, MS, NRPC stated that the Grid Security Expert System (GSES) was discussed in the 81st OCC meeting held on 20th November, 2012, and in the 27th NRPC meeting held on 30th November, 2012 wherein it was decided that POSOCO will convene a separate meeting with all constituents so that constituents have clarity on the proposal as well as to remove any doubts that they may have.

2. Subsequently, the scheme was again discussed in the 83rd OCC meeting of NRPC held on 17th January, 2013 wherein POWERGRID made a detailed presentation on GSES including the ten number of scenarios when the power system would be under stress. During this OCC meeting, POWERGRID and POSOCO furnished clarifications to the various queries. It was decided in this meeting that all constituents will send their written observation/ comments on GSES to NRPC Secretariat latest by 31.01.2013. Since, comments were not received from any constituent, this meeting was being convened to finalise the decision of the constituents of Northern Region to be filed before the Commission in compliance with the directions of H'ble CERC as recorded in para 1 of ROP of CERC dated 10.01.2013 in Petition No. 265/MP/2012.

3. As some of the distribution and generation companies were not present when the proposal was earlier deliberated, MS, NRPC requested POWERGRID to make a presentation. Accordingly, representatives of POWERGRID and POSOCO made presentation on ten number of scenarios when the power system would be under stress as identified by POSOCO and based on which, POWERGRID has planned the automated defense plan named GSES.

4. To a query from NTPC whether or not generation reduction at ISGSs was envisaged in the GSES, representative of NLDC clarified that reduction in generation at ISGSs was not envisaged under 2nd scenario namely Over-injection/Under-drawal but reductions in generation might be a requirement under scenario 5 and 6 (system Protection Schemes). He clarified that to begin with even the generation of State's generating stations will not be regulated from remote but only a signal will be communicated and operations for reduction of generation will have to be carried out by the operators at power stations. Representative of NLDC added that with the advancement of technology and consent of generating utilities, in future the issue of automatic reduction in generation might be considered.

5. Representative of NHPC informed that they had sent their initial comments and had further referred the issue to their design wing for further analysis. He added that detailed comments will be sent after receipt of observations from their design wing. He stated that their hydro stations were adhering to the schedules given by NRLDC and any backing down at R-O-R stations, which were mainly peaking stations, would result in spillage of zero incremental cost energy. Representative of NRLDC clarified that under load crash situations (such as on 4th February, 2013, when load crashed by about 10,000 MW, a number of thermal units were boxed up and loading on running unit was got reduced up to 60%) spillage of zero incremental cost energy cannot be ruled out.

6. Representative of SLDC, Delhi stated that they were dependent for almost 80% of their power from ISGS and with the load fluctuating from 1300 MW during off-peak hours in winter to 4000 MW during off-peak hours in summer, they would continue to under draw from the grid if generation at ISGS stations was not to be backed down. Representative of NRLDC clarified that such situations would have to be tackled at planning stage as GSES was meant to take care of power system under stress.

7. Representative of J&K Power Development Corporation (JKPDC) was of the view that in case of need for reduction of generation, it should be shared on equitable basis amongst the concerned generating stations. Representative of NRLDC clarified that generating stations have been indicated in the detailed report and these can be fine tuned in consultation with SLDCs. SE (O), NRPC suggested that for reduction in generation, generating stations should be selected based on sensitivity studies. Representative of NLDC suggested that in the event of congestion, a signal should go to 4-5 such stations simultaneously that could provide immediate relief or alternatively backing down could be carried out on rotational basis.

8. Representative of NTPC stated that System Protection Schemes are meant to cover the transmission constraints and therefore should be for a limited period only. He opined that while finalising the SPS, a time limit should be stipulated for CTU to strengthen the transmission system in that area for which SPS was planned. Representative of NLDC stated that some SPSs are planned for transmission elements for which N-1 criteria is not satisfied, there are other SPSs, which will be required on long term basis.

9. In response to a query, representative of NRLDC explained that it would be possible to dovetail future SPSs and if need be, existing SPS into GSES. He added that communication facilities would be created under GSES and monitoring of SPS would be feasible.

10. Representative of NTPC stated that the clarifications given by POSOCO and POWERGRID that - (i) ISGS were not covered in the GSES in the first place and (ii) only a signal will be communicated to the generating stations and operations for reduction of generation will have to be carried out by the operators at power stations, would be considered while submitting response of NTPC to Hon'ble CERC, which was likely to include the following issues:-

(i) Proposed GSES is the protective action whereas primary and secondary control actions are required to be taken before protective actions.
(ii) Whether any such system exists anywhere and any study or research has been done. Involvement of experts in the scheme has not been indicated.
(iii) Nothing has been mentioned about restoration of loads/ generation after operation of GSES.
(iv) In the meeting between Union Power Minister of India with Chief Ministers/Power Ministers of States of Northern Region, Point No. 11 of the 12 point resolution was for evolving a contingency load shedding protocol, especially when non frequency related load shedding is required. However, the proposed GSES includes many more issues.

He added that they would forward the copy of their response to NRPC Secretariat. Representative of POWERGRID clarified that for issue at (ii) above, there is a group of experts on the panel of POWERGRID, who has vetted the GSES and he assured

to consider suggestion regarding restoration of loads/generation mentioned at point (iii) above.

11. SE(O), NRPC stated that objective of scenario No. 1 out of the ten number of scenarios i.e overdrawal > 12% of schedule or 150 MW (PLC based scheme at LDCs) under GSES and the Automatic demand Management (ADM) as mentioned in clause 5.4.2 (d) of IEGC appears to be similar. Representative of NRLDC clarified that ADM will be a routine process to be implemented by Distribution Companies whereas GSES will come into operation after the failure of ADM and that will be at State level. He added that GSES envisages disconnection of radial feeders from 132 kV/ 220 kV sub-stations whereas ADM will involve 11 kV and 33 kV feeders under distribution companies. Moreover, the responsibility will lie with different authorities.

12. Representative of DTL stated that Distribution Companies in Delhi have implemented the ADM and have tested successfully. As such, implementation of load shedding through GSES was not required in Delhi. Representative of POWERGRID clarified that load generation balance within the Distribution Companies has to be maintained by Distribution Companies themselves and GSES will not interfere with the schemes of Distribution Companies in any way. He added that operational hierarchy wise Distribution Companies will act in the first place, then SLDC, then RLDC and GSES will be last safety back up. Representative of NRLDC requested SLDCs to have a look at the feeders identified for disconnection in the report and suggest changes if required as POWERGRID will implement the scheme as agreed to by the constituents.

13. To a query from the representative of DTL regarding checking the healthiness of UFRs and status of feeders connected, representative of NLDC clarified that it will be possible to monitor the status of UFR being in service or not. To a query from SE(O), NRPC regarding checking the healthiness of trip circuit of UFR, representative of NLDC clarified that it will depend upon the technology available at the time of purchase. In regard to query by many members regarding the utilisation of existing UFRs and those under procurement, representative of POWEGRID clarified that it would be possible to utilise all numerical UFRs in the GSES. He suggested discussing operational issues and assured that all design issues will be resolved at the time of detailed engineering. Regarding the basis of estimated cost of the scheme, representative of NLDC intimated this is based on the feeders considered in the detailed report. Representative of POWEGRID clarified that final cost may vary depending on change of scope consequent to change of feeders.

14. To a query from the representative of NHPC regarding the capacity/ capability of NRLDC to handle the available information, analyse it and take appropriate action, representatives of POSOCO and POWERGRID clarified that information would be available to Distribution Companies, SLDCs, RLDCs and NLDC and any one would utilise the information according to his functions and responsibilities. To a further query regarding varying the capacity of transmission lines corresponding to change in temperatures, representatives of NRLDC clarified that variation in capacity of transmission lines corresponding to change in temperatures has not been contemplated. However, he added that theoretically, it is possible to incorporate the same in the logic.

15. Representative of BYPL and TPDDL stated that they have the state- of-the-art ADM system in place. They expressed following views on GSES:-

(i) Presently, they are asked to shed load even under normal or high frequency when over drawl >150 MW. Sometimes, load shedding is asked for without indicating reasons. This is not in accordance with IEGC and if implemented, GSES should comply with requirements of IEGC.
(ii) Automatic scheme will not be workable due to time taken in revision of schedules by NRLDC/ SLDC.
(iii) GSES will consider over drawal for the State as a whole and may cause tripping of feeder of a Discom, which may be well within its intra-State schedule.
(iv) Frequency control is responsibility of both generators and loads but generally only Discoms are asked to vary loads. GSES should take care of this aspect.
(v) No responsibility is entrusted to generators for generation/ absorption of VAR.

16. Representative of NRLDC clarified that all existing practices will continue and reemphasised that with GSES in place, Distribution Companies will have chance to act first, followed by SLDC and then RLDC. He added that in the event of unit tripping, there is provision in IEGC regarding time to be given for revision of schedules.

17. Representative of DTL stated that they were working on last 03 scenarios out of the ten number scenarios in co-ordination with POWERGRID and requested that this aspect be duly considered while finalising the GSES.

18. Representative of SLDC, Haryana stated that:-

(i) Scenario No. 1 out of the ten number of scenarios and ADM are same and as such the two schemes should not be implemented simultaneously as this would involve duplication and wastage of money.
(ii) If, UFRS were being installed under GSES, these should be maintained under this scheme as well.
(iii) Input for GSES should be obtained from inter-face meters so that accuracy of drawl data is ensured. SCADA data often provides wrong information about drawal.

19. In respect of (iii) above, SE (O), NRPC clarified that errors in SACDA data were not on account of RTUs but was mainly due to non-functional RTUs and PLCC problems. Representative of SLDC, Haryana stated that if communication errors cannot be guaranteed, GSES will act on wrong inputs.

20. Representatives of UHBVPNL stated that presently, they do not have their independent control rooms and therefore could not implement ADM system.

21. Representatives of HPGCL stated that the quantum of generation backing down and its duration be specified. Further, he added that backing down should be done proportionately throughout the grid. Representatives of NTPC added that GSES should be able to indicate the revival of backed down generation consequent to improvement in grid parameters.

23. Representatives of PSTCL stated that the need for GSES has arisen because of delay in taking actions during grid disturbances that took place in July, 2012. He

added that GSES is supposed to be a back up to all the existing systems. However, nothing has been mentioned regarding dovetailing of existing systems with the GSES. However, he supported the views expressed by NTPC.

24. Representatives of SLDC, Rajasthan stated that the issue has been under discussions with their Distribution Companies and they would submit their comments later.

25. Representatives of Distribution Companies of Uttar Pradesh stated that presently they do not have the load control and all controls were being exercised by UPPTCL from Lucknow. Moreover, except for Distribution Company for Greater Noida, control rooms of other Distribution Companies have not been established.

Status of Automatic Demand Management.

27. Representatives of DTL stated that the Automatic Demand Management has been implemented in Delhi system.

28. Representatives of HVPNL stated that for Automatic Demand Management, Distribution Companies have been advised and they were installing their SCADA system and consultant has been appointed for demand forecast. However, he raised the issue for need of ADM when GSES was being installed.

30. Representatives of PSTCL stated the Automatic Demand Management was under preliminary discussions between PSTCL and PSPCL

31. Representatives of RRVPNL stated a committee has been constituted.in Rajasthan for Automatic Demand Management

32. Representatives of U.P, SLDC stated that Distribution Companies have been advised to set up their own Control Rooms for Automatic Demand Management. Noida Power Company in Noida has established the Control Room and ADM is in place.

33. Comments received from SLDC, Uttarakhand prior to the meeting indicate that they had formulated draft scheme for Automatic Demand Management Scheme and had sought certain information from Distribution licensee namely UPCL.

Annexure-I

List of participants in the the Meeting held on 07.02.2013 at NRPC Secretariat, New Delhi to finalise the views of NRPC on (i) Grid Security Expert System (GSES) and to (ii) discuss Automatic Demand Management Scheme

NRPC

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HPSEB LTD.-HPLDS

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UPPCL-UPPTCL-UPRVUNL

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एन टी पी सी लिमिटेड
(भारत सरकार का उद्यम)
NTPC Limited
(A Govt. of India Enterprise)

केन्द्रीय कार्यालय/Corporate Centre

Ref: 01:CD:717A:

Dated : 13th Feburary 2013

To

Member Secretary (NRPC / ERPC/ WRPC/ SRPC/ NERPC)

Sub: Submissions under Petition No. 265 / MP/ 2012 filed by PGCIL in the matter of Grid Security Expert Systems

Sir

This has reference to the petition filed by M/s PGCIL regarding implementation Grid Security Expert System (GSES) on All India Basis and subsequent discussions in RPC forums regarding same.

Please find enclosed NTPC's reply to the above Petition as filed with CERC which contains comments of NTPC on the GSES proposal. The same is for your reference and further necessary action please.

Yours faithfully,

13/2/2013

(M. K. V. Rama Rao)
ED (Commercial)

CC:

1. RED (SR / NR / NCR / ER-II / ER-I /WR-I / WR-II) / ED (Engg.) / ED (OS) / GM (OS-SIIS)
2. Head of Commercial (NRHQ / NCRHQ / ER-I HQ / ER-II HQ / WR-I HQ / WR-II HQ / SRHQ)

एन टी पी सी लिमिटेड
(भारत सरकार का उद्यम)
NTPC Limited
(A Govt. of India Enterprise)

केन्द्रीय कार्यालय/Corporate Centre

Ref: 01:CD:717A:

Dated : 13th Feburary 2013

To
The Bench Officer
Central Electricity Regulatory Commission
3rd & 4th Floor, Chanderlok Building
36, Janpath, New Delhi-110001

Sub: Reply to Petition No. 265 / MP/ 2012

Sir

M/s PGCIL has filed a Petition No. 265 / MP/ 2012 in the matter of Miscellaneous Petition for approval under Regulations 24, 111 & 113 of the CERC (Conduct of Business) Regulations, 1999 and under section 79(c), (d), (i) and (k) of Electricity Act-2003 for seeking direction for implementation Grid Security Expert System (GSES) on All India Basis

Please find enclosed NTPC's reply to the above Petition in 9 (Nine) copies. Copy of the reply has been forwarded to the petitioner (M/s PGCIL) and the speed post receipt in support of the same is enclosed.

Kindly acknowledge the receipt of the same.

Yours faithfully,

(Ajay Dua)
AGM (Commercial)

Encl: As above

BEFORE THE CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

PETITION NO. 265/MP/2012

IN THE MATTER OF :
Miscellaneous Petition for approval under Regulations 24, 111 & 113 of the CERC (Conduct of Business) Regulations, 1999 and under section 79(c), (d), (i) and (k) of Electricity Act-2003 for seeking direction for implementation Grid Security Expert System (GSES) on All India Basis

AND
IN THE MATTER OF : Submissions of Respondent No. 60, NTPC Ltd. as per directions in ROP for hearing dated 10.01.2013

AND
IN THE MATTER OF
Respondents: Himachal Pradesh State Electricity Board and Others

I, Ajay Dua, son of Des Raj Dua working as Additional General Manager (Commercial) of NTPC Limited having its registered Office at NTPC Bhawan, Scope Complex, Institutional Area, Lodhi Road, New Delhi 110003, do hereby solemnly affirm and say as follows:

1. I am the Additional General Manager (Commercial) of NTPC Limited and I am conversant with the facts of the case, and authorized to file this affidavit.

2. I have read the accompanying Submissions and I say that the facts stated therein are based on the records of the Respondent maintained in the ordinary course of its business and believed by me to be true.

(DEPONENT)

VERIFICATION:

I, the deponent above named do hereby verify that the contents of my above affidavit are based on records of NTPC Limited, the Respondent No.60 and believed by the deponent to be true to the best of knowledge, no part of it is false and nothing material has been concealed therefrom.

Verified at New Delhi on this 13th day of Feburary' 2013.

(DEPONENT)

BEFORE THE CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

PETITION NO.265 / MP / 2012

IN THE MATTER OF: Miscellaneous Petition for approval under Regulations 24, 111 & 113 of the CERC (Conduct of Business) Regulations, 1999 and under section 79(c), (d), (i) and (k) of Electricity Act-2003 for seeking direction for implementation Grid Security Expert System (GSES) on All India Basis

AND

IN THE MATTER OF: Power Grid Corporation of India Limited

…….PETITIONER

Versus

Himachal Pradesh State Electricity Board and Others

…….RESPONDENTS

Submissions of NTPC Limited (Respondent No. 60)

Most Respectfully Showeth:

1. As stated at para 2.0 of the Petition, the petitioner has filed the present petition consequent to a resolution adopted in a meeting held on 6th August 2012 of Chief Ministers of Northern states which was chaired by the Union Power Minister subsequent to Grid disturbance on 30th / 31st July. Before dealing parawise to the contents of the petition, the Respondent wishes to make the following preliminary submissions which are relevant for the matter in issue.

A. PRELIMINARY SUBMISSIONS

1. It is submitted that the meeting was held on 6.08.2012 to conclude resolutions which would ensure that such breakdowns in the grid donot recur. The proposal made by POSOCO vide letter dated 11.09.2012 is

named as “Automated Defense Plans for Secure Operation of the Grids” and that by Powergrid is named as “Grid Security Expert System”. The intent of both the proposals should be to maintain grid security and reliability as the name suggests. It is in the benefit of all the entities like generators, customers, system operator, transmission provider, market operator that the grid is secure & reliable and doesn’t fail like it did on 30th / 31st July 2012. In order to ensure the above, there are a few prerequisites which are detailed as below:

2. PREREQUISITIES FOR REILABLE OPERATION OF GRID

a. There are two levels of action in power system operation, aimed at avoiding collapses, viz. a Control System and a Protection System. The power system is designed considering credible contingencies and the Control system as designed ensure that the system operates with the desired degree of reliability. The protection system comes into play only when the control system fails to achieve its function or when events far in excess of the credible contingency do occur.

b. All the generators in a synchronously connected grid are locked in at the same frequency. The primary objective of any power system control is that the frequency be maintained constant. In interconnected power pools an additional control requirement emerges of inter system exchange control. The responsibility of inter system exchange violations (over drawal and under drawal) can be established and corrected only with reference to a particular frequency and hence control of frequency to even tighter bands has become the norm of the day.

c. The load in a power system is continuously varying depending on random changes in consumer load. Such changes in load, which are both slow and in small incremental quantities, changes the frequency of the system also very slowly and in small increments. The control system to correct such frequency changes needs to maintain the frequency constant by varying

the output of selected few generators, carrying such control margins all the time, by changing the Governor set points of these machines either automatically (Automatic Generation Control-AGC) or manually (Supplementary Control or Secondary Control). But such control margin delivery is possible only slowly. This control is both efficient and economic for slow frequency variations and usually this control targets a very small band of +/-0.015Hz, corresponding to the Governor Dead band as per IEC. The same control is also used to control the inter system exchange at the schedule.

d. Another kind of frequency change in any power system which happens due to sudden loss of a generation source or a load bus, which causes large quantum generation / load mismatch and consequently sharp change in frequency. The mode of control described in (c) above is of no use in such events being slow in delivery. In this kind of events the need is to deliver a large quantum of generation change quickly. Being an emergency situation, economy is not a consideration in this event and all machines in the system, selected to carry this control reserve, must contribute to this situation. This requirement is fulfilled by Governor Control. Governors of all machines respond to change their respective output as a fixed proportion of the frequency error in steady state, resulting in the fast correction of the frequency to a small steady state error (typical time of full delivery is one minute). The Supplementary Control takes over to restore the frequency to the target value slowly when the machines which had delivered the governor control reserves would have returned to the original schedule, getting ready for the next event. It may be pointed out that the Supplementary Control must deliver entire quantum of power change, albeit slowly. The Governor Control is also called Primary Control, with reference to its duty in sharp frequency change events.

e. Thus the frequency control system comprises of following controls

    - Primary control: localized automatic control which delivers reserve power in proportion to any frequency change;

- Secondary control: centralized automatic control which delivers reserve power in order to bring back the frequency and the interchange programs to their target values;
- Tertiary control: operator initiated change in the dispatching and unit commitment in order to restore the secondary control reserve, when the secondary control reserve is exhausted. This could even be achieved by demand disconnection.

For governor control to be fully functional there are some conditions which needs to be satisfied.

As stated above, the important function of the secondary control is to restore the margin delivered by the machines under primary control, so that the machine is ready for the next event. The secondary control can be achieved either automatically through AGC or by delivering the same manually by the system operator. While the latter is not suitable for multi utility interconnected systems (where AGC becomes the only option) manual secondary control works satisfactorily in single utility systems such as in the U.K.(manually by redispatch known as NETA).

Unless governor reserves delivered are restored by secondary control, thus achieving constant frequency operation, it would not be able to respond for the next event, the margin having been exhausted already. In the case where governor control is required to respond to a continuously changing frequency (sample frequency variation for India attached at Annexure-I), generator's governor would be constantly changing its output. It will also not be possible to make the corresponding change in input to the boilers of thermal machines as the requirement might have already become opposite by the time the boiler is ready to deliver.

f. It is submitted that in case our actual intent is to operate the grid reliably the above is a **"must"** condition and is achievable in Indian scenario also.

This constant frequency operation becomes all the more important when we target to create a "SAARC Grid" to avoid causing problems to our interconnected neighbours. The details on how constant frequency operation is possible in India is detailed below:

3. Constant Frequency Operation in India

i. It is submitted that this shall require secondary control system which could be by maintaining adequate spinning reserves. Further on the arguement that we do not have adequate generation capacity to meet our demand, it is submitted that the present installed capacity is about 206 GW, and average peak demand is just 140 GW. The total installed capacity may not be available due to fuel shortage/ machine unavailability but still lot of available capacity is left undespatched (~14000 Million units in April'12- Dec'2012 has been Unrequisitioned Surplus of NTPC stations). Such capacity can be despatched, once the target of constant frequency is set. The very purpose of Ancillary Service as proposed by POSOCO during last CAC meeting is for providing such support to the grid.

ii. It is also submitted that constant frequency is misunderstood as nominal frequency as well. It needs to be asserted that the constant frequency target of operation need not necessarily be the nominal (rated) frequency itself. The entire control system discussed above will work satisfactorily at any frequency, which is constant.

iii. There are certain advantages of operating at lower than nominal frequency. The connected demand itself gets suppressed, thus allowing more consumers to be serviced from the available generation capacity. On the flip side, lower the frequency of operation, higher is the risk of irrecoverable frequency decline and collapse, following a loss of generation event. A reasonable balance needs to be found between the two conflicting requirements, one of operating at lower than nominal frequency and the other of operating at the design point. It is submitted that the lower end of the IEGC stipulated frequency band can be a good choice to start with as the target frequency. The risks associated with operating at this

lower than nominal frequency can be mitigated to a large extent, by appropriate under frequency / rate of change of frequency load disconnection.

iv. Another notion among certain power engineers that since the energy efficiency is lower while operating at lower than rated frequency, the energy consumption would increase with reduction in frequency. This is not really the case. The efficiency of the drives does decrease with lower frequency. At the same time, these drives consume less power while operating at reduced frequency, as the delivered output also reduces with frequency. The increased energy consumption due to loss of efficiency is negligibly small in comparison to the decrease in energy consumption due to the fall in output itself. If one was to compromise a little on security, it is considered profitable to operate at a slightly lower than rated frequency.

v. Using an agricultural pump as an example, it can be seen that power output of such a drive varies approximately as the cube of frequency. This can be readily appreciated from the fact that the pump power is proportional to Q (flow rate) and H (pressure developed), while Q is proportional to the speed (frequency) and H is proportional to the square of the speed (frequency). Thus it can be expected that the pump power varies in the approximate cubic proportion of frequency. Carlson W Taylor, in his famous work on “Power System Voltage Stability” tabulates the index of variation of the magnitude of P & Q of various kinds of loads with frequency and voltage.

vi. On the other end of the spectrum due to operation at lower than rated frequency, there will be a marginal increase in the lighting load. The power consumption in lighting load is insensitive to frequency and the feeding transformer losses increase marginally due to higher flux density. Power System Stability will be some what positively affected as the series reactance of all the transmission elements will decrease in magnitude with frequency and the load angle reduces correspondingly. Among the adverse effects, increased iron losses in

transformers, shunt reactors and motors, reduced voltages, poorer metering accuracy (CVT accuracy is defined only at the rated frequency ± 0.5%) are significant.

vii. If it is decided that 49.50Hz is the lowest acceptable frequency of operation, the same could become the initial target for constant frequency of operation. Eventually, after constant frequency control mechanism is established and mastered, the target frequency can be raised to the rated as ways of 'suppressing demand' other than by allowing the frequency to fall are discovered. For instance, a more attractive demand suppression option is reduction in voltage by transformer tap changing. Such a measure is practiced globally and is some times termed as 'browning out'.

viii. Once constancy of frequency is targeted, the other control need becomes evident which is inter control area exchanges. Here again in the first phase, Regional boundaries can be identified as control area boundaries, with sub-control areas being the currently defined bid areas (where there is a need to restrict exchange with the adjoining areas) itself. This would bring about the all important control when emergency measures become meaningful.

4. It is submitted that the measures suggested vide the Petition is aiming at avoiding any Grid failure like the ones which happened on 30th / 31st July 2012. In this regard we would like to highlight that it is important to identify the root cause of the incident so that the solutions which we apply act in the manner to solve the problem and not aggravate problems. Following is submitted in this regard:

   a. The Grid failed on 30th /31st July 2012 after tripping of one S/C Bina-Gwalior Line (765 kV line being operated at 400 kV). IEGC provides at Regulation 3.5 (a)(i) (a)

      Quote

"As a general rule, the ISTS shall be capable of withstanding and be secured against the following contingency outages

a. without necessitating load shedding or rescheduling of generation during Steady State Operation:

- Outage of a 132 kV D/C line or,
- Outage of a 220 kV D/C line or,
- Outage of a 400 kV S/C line or,
- Outage of single Interconnecting Transformer, or
- Outage of one pole of HVDC Bipole line, or one pole of HVDC back to back Station or
- Outage of 765 kV S/C line"

Unquote

The event which happened was outage of one 400 kV S/C Line. Such line could have tripped for some other reason also (short circuit, lightining etc.) but that should not have caused the Grid to fail. In fact there should not have been the need of any rescheduling for such trip as per the Grid Code. **Failure of Grid on tripping of just one line needs more study such that actual solutions to the problem are found**. Few Suggestions submitted to Hon'ble Commission in Petition No. 167/ SM/2012 are reiterated and submitted for kind consideration again:

a. On failure of the Bina-Gwalior link, the grid collapsed since there were multiple tripping on Power Swing following tripping of just one line i.e Bina-Gwalior link. The grid could have probably survived such an event with following change in protection application:

i. The distance protections of lines are not intended for tripping on Power Swings. The problem is that the otherwise robust distance protection relays suffer from their inability to discriminate between the three phase fault impedance from the fictitious impedance presented to it during Power Swings.

ii. The relays can overcome this handicap by a supplementary logic of Power Swing Blocking (PSB) inherent to the relay. However, the choice of blocking one Zone, all Zones or any combination of Zones on Power Swing detection is left to the user.

iii. The practice followed in India is mostly of blocking Zone-2 and Zone-3 and allow the distance protection relay to trip in Zone-1. The situation leads to tripping of lines even for stable power swings.

iv. The world practice is (this is very vital for India, a large integrated ac system) to block distance relay tripping in all zones and to apply Loss of Synchronism protection on pre-chosen axis to cause separation in the event of unstable swings. The arrangement will cause no tripping for stable swings and positively separate for loss of Synchronism.

In case the above is adopted the lines would not trip for most Power Swings and the machines and the load in the system will adjust to its new equilibrium in case of a line fault and readjusted load flows. In case of actual risk of instability or loss of synchronism, the system needs to be split along the pre-chosen axis by application of "Loss of Synchronism" protection on selected lines.

The above suggested treatment of Power Swings in Protection application needs to be discussed among protection engineers for deciding the appropriate solution.

It is also submitted that following two consecutive events of delayed fault clearing in WR (southern Maharashtra) on 25th and 28th February 2007, NRPC had discussed this matter and decided that distance relays must be blocked on all zones by PSB feature. However the decision is yet to be implemented. The feature of Power Swing blocking has already been approved by NRPC. The matter was discussed during 18th PCM of NR on 3.09.2012 and minutes indicates following:

Quote

"Representative of RVPNL raised the issue of setting of Power Swing Blocking (PSB) feature in the transmission lines of POWERGRID. He informed that PSB feature has not been enabled in POWERGIRD lines for Zone-1 which is mandated as per the approved uniform philosophy of NRPC. Representative of POWERGRID agreed that in their system Power Swing feature is not blocked. It emerged that POWEGRID has been submitting a self-certification regarding cmpliance to protection philosophy of NRPC. In response to a query as to why POWERGRID had not blocked Zone-1 for power swing, representative of POWERGRID agreed to submit within a week the reason for the same."

Unquote

b. It is also submitted that the reason for tripping of Bina – Gwalior 400kV circuit #1 (the trigger event on both days) may be further relooked into so that appropriate solution to the problem is found and recurrence is avoided. Hon'ble Commission has issued ROP for Petition No. 167/ SM/2012 dated 31.01.2013 whereby following questions have been raised at Para 11 of the ROP:

Quote

"ii. When overdrawal messages since the afternoon of 29.7.2012 did not result in reduction in overdrawal, which lines were opened by NRLDC and for TTC violations at 14:41, why congestion notice was not given?...
iii. While granting shutdown for Agra Gwalior-II during peak demand period in NR, whether system studies were performed and approval of RPCs were taken as the shutdown resulted in reduction of 400 MW in import capability.
iv. Why TTC was not revised till 1100 hrs on 30.7.2012 (Post disturbance) when Agra Gwalior Line was under planned shutdown?
v. If it was found that Bina-Gwalior line had tripped, whether reasons thereof were ascertained by RLDC before allowing charging of the line again?
vi. Recording of WRLDC/NRLDC and other SLDC control rooms from evening of 29.7.2012 to 31.7.2012 be submitted.
viii. Instructions issued by WRLDC to SLDCs to reduce underdrawal? Is this the normal format of the message or should they not have been asked to revise their schedule from Central Sector Generating stations or reduce their own generation…..

ii. If initial outage of Agra-Gwalior line was for three days, when extension was requested and when work was actually completed? Whether approvals of RPCs were taken for this outage?
iii. Details of protective setting in Bina-Gwalior line, Main I & Main II and reasons for tripping."

Unquote

Submissions of details of the above to Hon'ble Commission could throw more light on root cause of the problem, so that an appropriate solution is found out.

B. DETAILED SUBMISSIONS ON THE PROPOSAL

1. It is submitted that prima facie following issues emerge from the Petition:

   a. The responsibility of CTU is defined under the Electricity Act at Section 38 as:

   Quote

   "(a) to undertake transmission of electricity through inter-State transmission system;
   (b) to discharge all functions of planning and co-ordination relating to inter-State transmission system with -
   (i) State Transmission Utilities;
   (ii) Central Government;
   (iii) State Governments;
   (iv) generating companies;
   (v) Regional Power Committees;
   (vi) Authority;
   (vii) licensees;
   (viii) any other person notified by the Central Government in this behalf;
   (c) to ensure development of an efficient, co-ordinated and economical system of inter-State transmission lines for smooth flow of electricity from generating stations to the load centres;
   (d) to provide non-discriminatory open access to its transmission system …."

   Unquote

   The functions include planning & coordination for development of Inter-state transmission system and exclude grid operation. The present Petition is about Grid operations which is under the functions of RLDC at Section 28 (b) of the Act. Further POSOCO has been created as per the directives of Government of India as contained in letter No-41/20/2005-PG dated 4.7.2008 for **independent system operation** of the National Load Despatch Centre (NLDC) and Regional Load Despatch Centres (RLDCs).

The petition for designing and managing grid operations is being filed by PGCIL whereas as per the para 5 (a) above the same is a function of POSOCO. The Petition filed by PGCIL is not maintainable under the Act.

Notwithstanding the above, detailed submissions , the Respondent have in the Petition are hereunder:

b. The mandate given by the said charter of resolutions of the Northern Region Chief Ministers meeting was to "evolve a contingency load shedding protocol". The present proposal of Powergrid covers many more issues (like generation shedding), including several of which are being addressed separately in various forums (like islanding). The coverage of the proposal may be limited to the resolution made.
c. Several principles which are currently under review / examination by Hon'ble Commission has been stated as final and included as part of the logic. Such references may be deleted and the outcome of pleadings before Hon'ble Commission in such matters should only be considered. One example is pertaining to the methodology of computing TTC which is under discussion of Hon'ble Commission in Petition No. 188/ SM / 2012 and has been included in the subject Petition at Para 1.2 (iii) of ENCL-3.
d. The Petitioner has not indicated whether such proposals are in line with global practices followed in various grids which are more complex, geographically diverse and handling more quantum of power. Besides, the Petition doesn't cover global experiences in regard to various suggestions in the Petition (SPS, Load shedding, Generation tripping at high frequency).
e. Petition has not been backed up by any research work or study from any independent technical expert institution such as IITs.
f. Several suggestions made in the Petition in regard to a complex Grid having multi users and several stakeholders are unilateral and have been placed before the Hon'ble Commission without necessary background

work at various technical sub-committees of RPC. The suggestions seek to introduce an entirely new and untested paradigm of grid operation with no parallels across the globe and the same are contrary to Regulations of Hon'ble Commission.

g. The charter of resolutions was made by the Chief Ministers of the Northern states and may not be binding / applicable for other regions. However, POSOCO/ Powergrid proposal covers all regions and states.

2. It is further submitted that our parawise detailed comments are as follows:

POSOCO Proposal (Automated Defense Plans for secure operation of the Grids) at ENCL-2:

a. It is submitted that at para 2.0 (i), POSOCO has proposed automated action for load disconnection (on rotational basis), when a constituent's over-drawal exceeds the set value (not specified) when frequency is falling below 50Hz. There needs to be a description of how such a situation would be ascertained that frequency is falling and would continue to fall. Because in case frequency on the contrary rises by the time assessment is done, load shedding would further raise the frequency. The need for such an action without considering all the relevant issues, in the current operating regime has not been clearly spelt out. Such an action is beyond and contrary to the Regulations of the Hon'ble Commission such as IEGC, UI Regulations.

The Summary table at the end of the document quantifies the logic to be triggered for automated load shedding. There is need to identify that when and how the disconnected load will be restored. If the frequency recovers immediately, will the load be restored immediately? Such continuous disconnection & connection may not be the right approach.

b. Further para 2.0 (ii) deals with Over-injection by Generating Stations (presumably ISGS) and Under-drawal by State Utilities. In dealing with the former POSOCO states as follows:

Quote:

"Power generating stations shall normally maintain their injection into the Grid ***strictly*** as per schedule."

Unquote, Emphasis supplied.

However IEGC provides at Regulation 6.4 (10) as below:

Quote:

"The ISGS would ***normally*** be expected to generate power according to the daily schedules advised to them. The ISGS ***may also deviate from the given schedules within the limits specified in the CERC UI Regulations*** of CERC, depending on the plant and system conditions. In particular, they may be allowed to generate beyond the given schedule under deficit conditions as long as such deviations do not cause system parameters to deteriorate beyond permissible limits and/or do not lead to unacceptable line loading."

Unquote, Emphasis supplied

The suggestion of POSOCO is not in consonance with CERC regulations. A similar argument is applicable for the under-drawal of the utilities also. In case POSOCO/CTU had faced any difficulties in operation of the Grid with the existing CERC Regulations the suggested way would have been to approach the Hon'ble Commission with the same and seek directions rather than to propose modalities in contravention of the Regulations and seek the Hon'ble Commission's approval for the same. Hon'ble Commission vide Order dated 14.01.2013 in Petition No. 249 / MP/ 2012, 250 / MP / 2012, 264 / MP/ 2012 directed following at para 9:

Quote

"With regard to the submission of NLDC that overdrawal irrespective of the frequency should not be allowed, we intend to clarify that at present, UI Regulations and Grid Code allow overdrawal within prescribed limits in normal

situations and therefore, no such directions can be issued which would be contrary to the regulations"

Unquote

Accordingly any suggestions in violations of CERC Regulations may not be considered.

The Summary table at the end of the document quantifies the logic to be triggered for automated generation reduction. However, the quantum of such generation reduction is not mentioned. The power stations are advised to wire the automatic action either to trip the generating unit or to reduce generation. When and how the generation will be restored is not mentioned. If the frequency recovers immediately, will the tripped generator be able to be restored immediately? The proposal doesn't provide for the restoration action which probably indicates that the proposed scheme is not well thought out and only seeks to have patch solutions to a particular situation without considering any newer consequences such a solution may introduce.

With reference to the two points discussed above we once again wish to point out that over drawal and under-drawal loses its meaning unless the same is mentioned with reference to a particular frequency. This aspect has been discussed in the Preliminary submissions at para A and has also been submitted by NTPC to Hon'ble Commission in Petition No. 47/MP/2011, 49/MP/2011, 50/MP/2011, 51/MP/2011, 52/MP/2011. It is possible for every entity to be drawing according to its drawal schedule and still the system operates at a low frequency also. The need of the hour is to recognize this dynamics of the interconnected power system and strive to introduce constant frequency control, which need not necessarily be 50Hz, to begin with. Once constancy of frequency is targeted, the other control need becomes evident which is inter control area exchanges. The details are submitted at Para A (viii) above.

It is also submitted that no generating unit can or should be wired to trip to control high frequency. High frequency is not an indicator of collapse. The system is

considered to be safer at higher frequencies, during dynamic periods. The generation reduction by revision of schedule is very effective and may be followed. In case the Hon'ble Commission feels that such a scheme is desirable, it is suggested that the command so issued to the generating station may be wired as an emergency alarm and the operator will take immediate action to reduce generation by the quantum desired. Making the action automatic would be too complicated considering the number of units involved and their operating condition and would entail risk to secure operation of the grid.

Various reasons for which automatic reduction may not be advisable are:

Running conditions of individual units cannot be ascertained from remote before changing the load. Automatic reduction may disturb the stability of units as submitted below.

i. Load and operating conditions of the units are best known to the operating staff present in control room. As most our units are not working at state of art technology and 100% assured reliability, it is best suited for any load adjustment from the control desk to avoid equipment malfunction and possible outages.

ii. Coal availability and quality of coal (source dependent) are important factors in deciding the selection of mills and their loading levels. Any variation in load without considering these factors may lead to unit outage on flame failure.

iii. Many units continue to operate with liabilities due to non availability of planned outage schedule mainly due to heavy demand on grid. Abrupt variation in load without the assessment of the healthiness of the unit may lead to unforeseen failures.

iv. All process control loops are not working on auto which necessitates manual intervention for any change in load (Seal steam pressure control. Attemperation, aux steam feeding etc.)

v. Some (500MW and above) employ Turbine Driven Boiler Feed Pumps (TDBFP). These machines are highly sensitive (particularly during part load operation) to extraction steam pressure which is dependent on unit load.

c. It is submitted that para 2.0 (iii) proposes automated under-voltage load disconnection. It is necessary to have a voltage / reactive power control mechanism in place before disconnection of loads is attempted. This aspect is not finding a mention in the document at all.

d. It is submitted that para 2.0 (iv) indicates measures to be taken in case of ICT / Line loading crossing the set limits. In this regard it is submitted that, ICTs are provided as banks of 2/3/4 at any substation. In case of outage of one ICT, the other ICTs must be capable of continuing in service; even with some amount of over loading that the transformers are capable of (normally up to 150%. This would need appropriate protection setting especially of the over current relays.

1. Overload relays should only be wired for annunciation, not tripping
2. IDMT O/C relays are intended as back up protection for short circuits and not for over load and the latter should not be targeted. The IDMT O/C relay setting should be such that it allows the maximum over load permissible. The over loading can then be corrected by rescheduling the dispatch or in the extreme situations by re-aligning transmission system.

e. It is further submitted that 2.0 (v) deals with actions for TTC limit being exceeded. TTC out of control areas needs to be controlled perpetually, rather than resorting to load shedding and generation reduction as an emergency action as proposed. In off line scheduling, care is taken to avoid TTC violations. In real time operations however there is no control action to take corrective actions, we have chosen not to have the appropriate control (indicated as “absent by design” by POSOCO). The need of the hour is to recognize this need and realize an appropriate control system. Such a control system exists, in power systems in other countries in the world.

In case any generation reduction is required after a control system is designed, while processing the same , a cue should be taken from CERC Long term,

Medium term Open Access Regulations, 2009 which provide at Regulation 25 that when for the reason of transmission constraint or in the interest of grid security, it becomes necessary to curtail power flow on a transmission corridor, curtailment may be done by RLDC with short term customer to be curtailed first followed by medium term customer followed by long term customers.

f. In point no. 2.0 (vi) SPS for loss of generation exceeding 1000MW or for loss of high capacity transmission corridor is proposed. SPS a powerful tool for dealing with specific constraints in the system and should be used sparingly. If SPS becomes necessary for loss of each generation capacity loss of 1000MW and outage of a line, then probably our power system planning and operation is faulty. It has been NTPC's consistent view that many of the SPS which are under proposal are not really necessary and should not be dealt casually. Again this is a case of relying on protection rather than control, which needs to be corrected.

Further it is indicated that 6.5 (27) of IEGC provides that

Quote

"When for the reason of transmission constraints e.g. congestion or in the interest of grid security, it becomes necessary to curtail power flow on a transmission corridor, the transactions already scheduled may be curtailed by the Regional Load Despatch Centre."

Unquote

It is submitted that RLDC is sufficiently empowered vide the Regulations to revise the schedules in the interest of grid security.

g. A similar emergency action is proposed for increase in load angle separation between critical nodes at point no. 2.0 (vii). Increase in load angle is a slow process and correction of the situation must be ideally made well before the situation grows into an emergency. Controlled re-scheduling, re-dispatching and as a last resort load disconnection are all required to be exercised manually by the system operator and the situation must not be allowed to become an emergency. When it comes to emergency action, why are we talking about rotational load

disconnection? Here again the control action which is very easy is foregone and emergency action is being proposed instead of control action which are very easy.

h. Point no. 2.0 (viii) and (ix) reiterates the requirement of Under-frequency and Rate of Frequency decline relay application. It is not clarified in the proposal if any central action is considered. It appears that none are proposed from the annexure.

i. In point no 2.0 (x) mention is made of Islanding schemes for Power Stations. This aspect is being dealt separately as a part of the implementation plan for the enquiry committee recommendations under the leadership of CEA. The islanding schemes under finalization under the guidance of CEA are at variance with the ones listed here. It appears that this document proposes loosely several islanding schemes which could be conceived, where as work is already in progress in the matter otherwise. The proposal here appears to be duplication.

j. It is submitted that Para 3.5 of the Petition indicates that all state owned coal fired and gas generating stations above 250 MW would also be identified for automatic generation regulation actions. The same was indicated by POSOCO during OCC meeting of Northern Region on 17.01.2013 as follows:

Quote

"On a query from representative of NTPC, representative of POSOCO confirmed that GSES as envisaged presently would be based on automated load shedding and generation control in the SLDC control areas. No Central Sector Generators have presently been considered for reduction in generation under GSES."

Unquote

However the POSOCO report at Annexure 3.A for Western Region (Page No. 126 of Petition) proposes List of ISGS for generation regulation. It seems Petitioner / POSOCO is not sure of their plan and proposal and what is the desired outcome of such a proposal.

k. POSOCO proposal for Eastern Region at Annexure 2.B covers Action plan for ICT/ line loading crossing normal operating limits ("indicates it to be SIL")for various lines such as Farakka-Malda, Rourkela –Talcher etc. It proposes various actions like shedding load or generation restriction through SPS. Any SPS is implemented after discussions in RPC keeping in view the desired outcome is achieved. Whether such SPS is required in the proposed line needs to discussed at RPC forum. It is not indicated whether the SPS is for outage of one line or both lines. The action plan (identification of load & generation) also needs to be finalised after considering various sensitivity studies. Also other actions to reduce the tendency of power flow increase in these lines are more appropriate

l. It is submitted that Annexure 1.5, defense plan for Northern Region-Uttar Pradesh indicates SPS which are indicated as "in service" such as Agra –Gwalior & Balia Bhiwadi which is actually not in service.

m. It is submitted that Annexure 3.A for Western Region provides logic for Generation Regulation. Again it is indicated that in case Freq>50 & (Actual – Schedule) < - 150 MW, action will be "Unit tripping or generation reduction through secondary control". The logic appears to be incorrectly stated as the paragraph is dealing with "overinjection". Possibility of ISGS overinjecting more than 150 MW above its schedule when freq>50 hz is normally not applicable. Such automatic arrangement is hence not necessary. Sipat U#3 injection on 30th July 2012 as infirm power which was not permitted to be shut down by WRLDC is the exceptional situation which need not be the basis of such elaborate schemes. However in case Hon'ble Commission decides that such a Scheme is required, the command contact will be wired for emergency alarm and reduction would need to be carried out by operator.

Powergrid Project Report (GSES) at ENCL-3:

Powergrid has prepared a project report based on the requirements indicated in the POSOCO proposal discussed above. The same is named as Grid Security Expert System (GSES). The said report was examined and we offer the following comments:

n. Under section 1.1.3 the DPR discusses the enquiry committee report (30th & 31st July 2012) and refers to the recommendation relating to Governor Action and the desirability of having a fully functional Governor Control. The subject may not be relevant to this project. In this regard, once again it is pointed out that currently NTPC steam turbine machines are operating on Restricted Governor Control as per the applicable Regulations of Hon'ble Commission and that it is not the same as a fully functional governor control. For governor control to be fully functional there are some conditions which needs to be satisfied.

    1. The generator must be having all its primary control reserves in store for the event of frequency fall.

    2. These reserves include throttle reserves, which are intentionally maintained at all times for such an eventuality. Such reserves are not mandated and hence not carried in many machines.

    3. Such reserves cannot be available perpetually. A machine operating on a steady load for a considerable period of time alone can have such a reserve readily available for delivery. If the machine had been constantly varying its output in its effort to damp frequency changes will not have such reserves.

    4. It is incorrect to state that the thermal inertia in the boiler of the steam machine will provide this all important output increase by governor action. The same is in contradiction with the first law of thermodynamics!

    5. It is inevitable that the fuel firing in the boiler has to be altered to cause a change in output (the response time could be as high as 4-5minutes) for any significant duration of time. For doing that there has

to be an assurance that the primary control reserve has to be retained for a pre-stated period of time.

6. There has to be a mechanism to return these machines which had delivered the primary control reserves to be returned to the pre-incident loading by resetting the governor control error (this requires the frequency to be returned to the pre-incident value), to be ready for the next event.
7. For appreciating this arrangement and the requirement / function of the Governor Control, it needs to be recognized that the Governor Control is capable of delivering a large quantum of power quickly and this capability cannot be wasted in a perpetual need to act and reset as the frequency follows a random pattern. Such large quantum of reserve deliverable in quick time needs to be preserved. This can be done with the governor control active (but not acting!) by maintaining frequency constant, 50Hz or otherwise. This can be done if the usual slow, small quantum load change ever present in any power system (and the consequent slow drifts in frequency) is perpetually corrected to close margins (within the governor dead band) by a different mechanism. This other mechanism is called Secondary Control, which is indicated as “absent by design” by POSOCO in various forums.

The last two points above can be simply stated as frequency being maintained constant at 50 Hz or otherwise. Governor Control cannot be active on machines, unless frequency is kept constant, by a composite control system. Governor Control performs an important function in the frequency control system. The conception that the Governor Control is suitable for operation all by itself is incorrect. In fact India is one of the very few countries in the world where a constant frequency control system is not even under consideration. There is an urgent need to reconsider the conception that Governor Control can be active without secondary control. It may be pointed out by some in this regard, that AGC (Automatic Generation Control) is not used in England either (meaning by

implication that Secondary Control is nothing but AGC)! Secondary Control is not necessarily automatic rather it may be manual as in U.K and as explained in our Preliminary discussions.

o. It is submitted that para 1.2 indicates following

Quote

" inspite of consistent efforts by RLDCs, it has not been possible to get the desired supports in terms of load relief from State Utilities or Generator Utilities……..

In view of recent Grid disturbances, failure of self defence mechanism system like Under Frequency relays, df / dt relays, free governor operation it is need of the hour that a Grid Security Expert System is implemented to disconnect the loads or generation depending on the criticicality of the Grid…."

Unquote

In this regard following is submitted:

- CERC Order dated 30.07.2012 in Petition No. 125/MP/2012 provided only for opening of feeders for load disconnection and not generation disconnection which would further endanger grid.
- The indication that there is a failure of Free Governor mode of operation is misleading, since currently Restricted governor mode of operation is being implemented in our country. In case Petitioner desires to implement FGMO, a prior control system as detailed in our Preliminary submissions would be required.
- Further Petitioner proposes to disconnect the generation depending on "criticality of Grid". Various criticalities being indicated by Petitioner are controllable factors which can be curbed proactively so that they donot reach the extent of criticality. Various actions of generation disconnection will make the grid more critical and may ultimately lead to collapse.

p. It is submitted that para 1.2 also indicates that ”some generators are injecting more than the schedule & it is unsafe, the same shall be automatically cut off”. It is submitted that Hon’ble CERC already provides vide IEGC and UI Regulations the injection allowed. The Regulations were notified by CERC after considering “safe” operation only. Now terming any injection as “unsafe” and proposing to disconnect the generator will be against CERC Regulations and counterproductive.

q. It is submitted that para 1.2 (i) indicates that

Quote

“It may further be noted that in our power system we donot have the AGC and secondary control in function”.

Unquote

It is submitted that the above systems have not been envisaged in our system operation which are proactive measures to control the system. Rather all reactive measures such as load shedding/ generation shedding etc. are being made in the current proposal.

r. It is submitted that para 1.2 (iii) defines overloading of critical lines and proposes that minimum of SIL, Z3 setting and Stability limit to be considered. This matter is already under consideration of Hon’ble Commission under Petition No. 188/ SM/ 2012. Any proposal in this regard in this Petition is not required. Further any such action is not necessary for line loading limits as the lines have Loadability up to thermal limits, which would never be reached. The loading limits like SIL and Zone-3 are not at all relevant. Zone-3 reach setting should allow the highest loading and in case there is any infringement there are measures to eliminate such situations by use of suitable blinders. Zone-3 reach setting limiting line loading is grossly mistaken concept. In any case, Loading limits are not prescribed line wise, but the safe loading limits are estimated by stability considerations. Essentially it requires the estimation

of the ability of the system to withstand any credible contingency. Setting line wise limits would impose severe restrictions in service and has no meaning. Such measures are extremely restrictive and indicate insensitivity to the customer's cause.

NERC Blackout report also recommends: that the zone 3 relay, if used, should not operate at or below 150 percent of the emergency ampere rating of a line, assuming a 0.85 per unit voltage and a line phase angle of 30 degrees. However, if at critical locations, the Z3 setting is found to be restricting line loadability, alternate setting philosophy or new protection system immune to line loading may be adopted.

s. It is further submitted that para 1.2 (v) indicates following

Quote

"In our system ACE and AGC system are not functional hence necessary support from the system is not automatically available. Further the Restricted Governor Operation has not been in place in spite of several discussions."

Unquote

It is submitted that Petitioner is indicating that ACE & AGC are not functional i.e they are being provided and not functioning. In fact these systems has never been planned in our Country and not even proposed after the Grid disturbance. The Petitioner has not explained why these are "not functional". Further regarding RGMO it is submitted vide our preliminary submissions at Para A that there is a need of Control system to be put in place to operate the grid reliably and for FGMO to be fully implementable as desired..

It is further indicated that

Quote

"In view of the above for secure grid operation the immediate load disconnection in the import area and back down of the generation in export area needs to be implemented."

Unquote

In this regard CERC Congestion Regulations provide at Clause 6.5 of detailed Procedure

Quote

"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.

Unquote

The above also implies that for relieving congestion, as prescribed by CERC regulations, no reduction in generation is warranted in export area and reduction of load in import area is more appropriate. Alternatively, increasing generation in import area or reduction of generation schedules of various units in commercial operation in export area could be attempted in place of tripping the generator.

Further the Enquiry Committee report pointed out at para 5.3.6

Quote

"5.3.6 Dynamic security assessment and proper state estimation

The operators, at present, cannot readily determine whether the line loading will actually trip a relay. However, although they can, by doing an online contingency analysis, determine whether the system is secure or not. If the system is insecure (in an alert condition), the following preventive actions can be taken:

a) Use any controllable elements, like HVDC and TCSC, to re-route power flows. If continuous capability limits have been reached short time overload capabilities may be used to buy some time for other actions. The amount and effect of the rescheduling will have to be checked using online load flow/stability analysis.

b) Generation rescheduling may be attempted. An available hydrogenerator may be called on to generate power.

c) Load tripping may be attempted to reduce line loading."

Unquote

The above suggestions at (b) above has not even been considered in the Petition.

t. Many of the proposals made by POSOCO has been modified in the GSES document by Powergrid. Efforts have been made to align the logics to the CERC regulations. The reasons for the change are not clear. Some examples are:

1. Over-drawal of 12% or 150MW (UI) when frequency is less than 49.5Hz is proposed as the trigger logic.

2. UVLS is proposed to be initiated based on a large number of scenarios built in the GSES using numerical simulations done off-line. It is not clear if as many number of load disconnection scenarios also will be created. Once again this is a case of control function being substituted with a protection system. The trigger is proposed to be with dV/dt threshold. Such a problem is contributed mainly by automatic voltage regulation at distribution level by automated tap changing which is not done in India. Hence the same may not be applicable for our case where load tap changing is never done.

3. Over loading of critical lines is proposed to be determined as the minimum of SIL, Zone-3 reach setting and Stability limit. The only limit applicable must be the last one, that too determined by what if studies. SIL may not be relevant if voltages at either end can be supported. Zone-3 setting can be made immune to load encroachment by use of appropriate blinders or even by reducing the Zone-3 reach to Zone-2. Load encroachment into Zone-3 is a real issue in our system where Zone-3 reach is limited to the next voltage level. Also, Zone-3 load encroachment on the Bina – Gwalior line may not have been the

case on 30th and 31st July either, unless the adopted settings were in error. Zone-3 load encroachment is real issue only in countries where Zone-3 reach is set on first principles and several lines emanate from the remote end bus, both not true in the case of Bina – Gwalior.

4. SPS based on several case studies is proposed for outage of more than 1000MW generation or a high capacity corridor. Such an arrangement will not be necessary if the system is operated with the desired contingency security. Following the event there could be rescheduling / re-dispatching to restore the contingency security. In any case, it will be unwise to operate compromising the contingency security, solely relying on SPS as a SPS failure would then lead to catastrophic failure. It is submitted that such general rules should not form the basis for SPS and only serious events, which fall beyond the credible contingencies, should be considered for such arrangements.

5. With reference to angular difference between nodes the report is inconclusive. Measuring angular difference is one aspect. Deciding protective action and at what angle of separation is a different matter altogether. The angle should not be allowed to increase to the levels when a protection needs to be used. Corrective action like rescheduling etc need to be taken before. For the sake of clarity it must be pointed out that this is not a Loss of Synchronism protection.

6. PGCIL has indicated generation reduction for overloading of critical lines at para 1.2 (iii) & violation of TTC at para 1.2 (iv) and indicates only load disconnection for above two cases, whereas POSOCO report suggests both load shedding and generation tripping for the above cases.

7. GSES DPR at para 8 indicates that

Quote

In case of non-functionality of command from SLDC, RLDC shall execute the command. However in case of disconnection of generator (backing down of generation as being used for SPS) the command shall be executed from RLDC."

Unquote

The above indicates generation disconnection by RLDC whereas POSOCO report provides generation disconnection by SLDC & then after a time lag by RLDC in case of no action.

xi. GSES DPR at para 8.3 provides following

Quote

"In case of back down of Generators the DTPC system actuates the contacts the MW output generation setting of the generator. According to the Target MW output setting, the Steam bypass (HP/LP) and coal firing is varied and the desired back down is achieved."

Unquote

In this regard it is submitted that the proposal above is not possible in stations. Rather it is suggested that the command so issued to the generating station may be wired as an emergency alarm and the operator will take immediate action to reduce generation by the quantum desired. Making the action automatic is too complicated considering the number of units involved and their operating condition and is risky.

xii. It is submitted that para 7 of DPR for communication system indicates following:

Quote

"POWERGRID, as the Central Transmission Utility, is entrusted with the responsibility of establishment and operation of Regional and National Grids…".

Unquote

It is submitted that operation of the grid is sole responsibility of System Operator under the Electricity Act 2003. Further National Electricity Policy provides following:

Quote

"5.3.7 The spirit of the provisions of the Act is to ensure <u>independent system operation through NLDC, RLDCs and SLDCs.</u> These dispatch centers, as per the provisions of the Act, are to be operated by a Government company or

authority as notified by the appropriate Government. However, till such time these agencies/authorities are established the Act mandates that the CTU or STU, as the case may be, shall operate the RLDCs or SLDC. The arrangement of CTU operating the RLDCs would be reviewed by the Central Government based on experience of working with the existing arrangement. A view on this aspect would be taken by the Central Government by December 2005."

Unquote

Further as detailed at para B (1) (a) above Government of India as contained in letter No-41/20/2005-PG dated 4.7.2008 for independent system operation of the National Load Despatch Centre (NLDC) and Regional Load Despatch Centres (RLDCs). Hence "responsibility of operation" by CTU is not correct.

xiii. It is submitted that the Petition pertains to matters of operation of the grid which is under sole jurisdiction of System Operator. The subject of the Petition doesnot come under jurisdiction of PGCIL. Hence the Petition be rejected.

C. Conclusions

a. GSES is being conceived as a protection system for several grid conditions which can pose a threat to the security of the grid. It is inappropriate to think of a protection system being conceived when a control system capable of preventing such situations is not even being considered. It is submitted that instead a control system to take care of the current chaos situation needs to be considered. Especially when it is proposed to spend large sums of money we must move in the direction of our long term goal rather than adopt simplistic solutions for the immediate problem.

b. The intent of operating the grid in a reliable and secure manner would require following:

a. Designing, implementing & refining a control system for constant frequency operation to make the Grid reliable by taking various proactive control measures in normal situations so that they donot mature into emergency conditions in place of reactive emergency protection actions.

b. Addressing credible contingencies through optimal planning as mandated in IEGC and through revised scheduling and despatch.

c. Analysing the root causes of the recent grid failures and comprehensively reviewing the grid protection philosophies which may have become irrelevant in present level of grid interconnections.

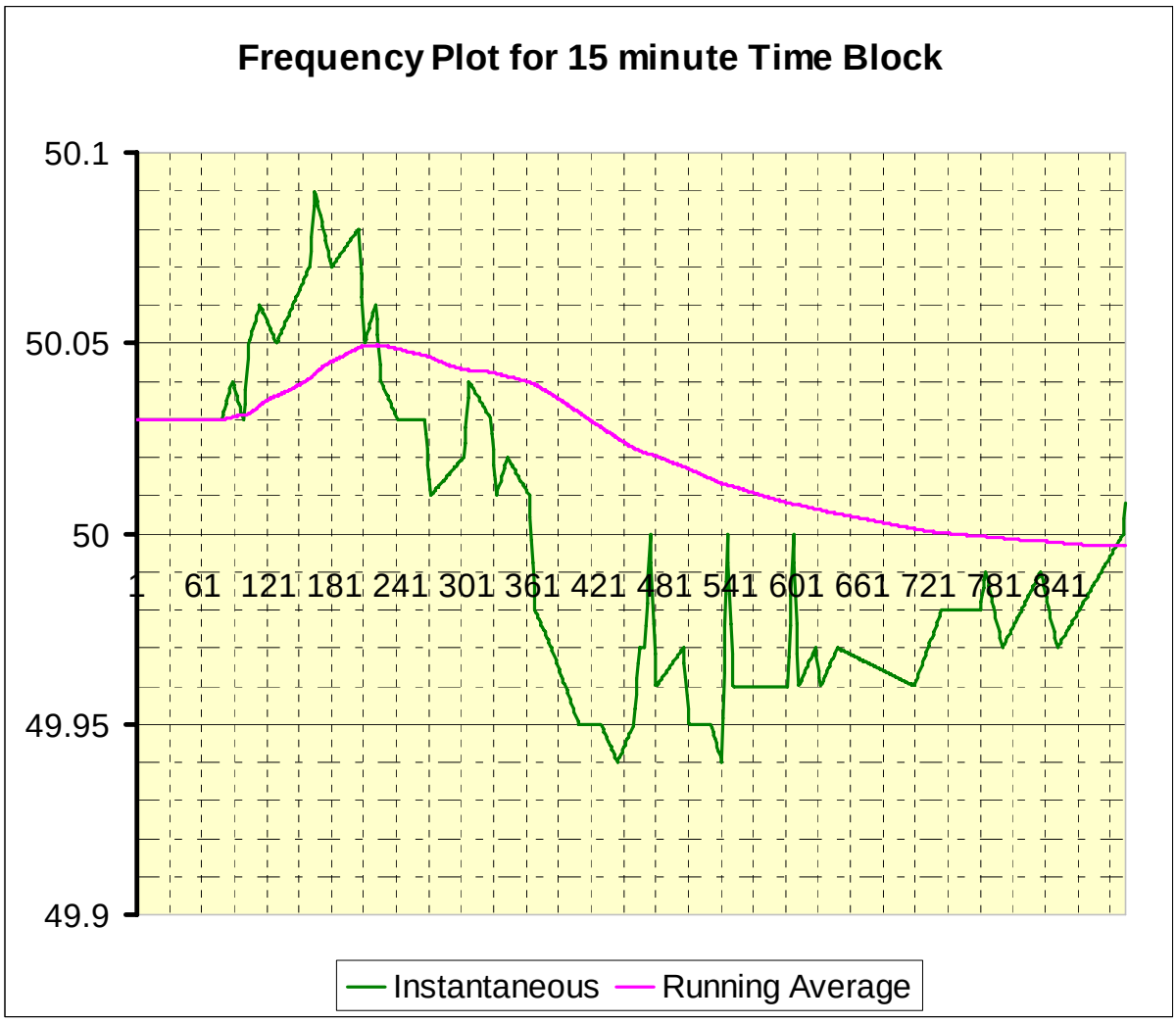
(Respondent No. 60)

NTPC Limited

New Delhi,

13.02.2013

Annexure-I


Frequency Plot for 15 minute Time Block
50.1
50.05
50
49.95
49.9
1
61
121
181
241
301
361
421
481
541
601
661
721
781
841
Instantaneous
Running Average

मुख्य अभियन्ता(ऊर्जा प्रणाली)
स्टेट लोड डिस्पैच सेन्टर
उ0प्र0 पावर ट्रान्समिशन कारपोरेशन लि0
(उत्तर प्रदेश सरकार का उपक्रम)
शक्ति भवन, 14 अशोक मार्ग,
लखनऊ-226 001
दूरभाष सं0 : (0522) 2287879 फैक्स : 2287880
ई-मेल : **system.uppcl@yahoo.com**

Chief Engineer (Power System)
State Load Dispatch Centre
U.P. Power Transmission Corporation Ltd.
(A U. P. Govt. Undertaking)
Shakti Bhawan, 14, Ashok Marg
Lucknow-226 001
Phone : (0522) 2287879 Fax : 2287880
E-mail : **system.uppcl@yahoo.com**

No.: 368 /CE(PS)/EE-VI

Date 08 February, 2013

Speed Post
Through
Fax Also

Superintending Engineer (Operation)
Northern Regional Power Committee,
18-A, Shaheed Jeet Singh Marg,
New Delhi- 110 016

Sub- Compliance to directions of Hon'ble CERC-meeting to finalise the views of NRPC on (i) Grid Security Expert System (GSES) and to (ii) discuss Automatic Demand Management Scheme-regarding.

Kindly refer to your office letter no.: NRPC/OPR/113/05/2013 dated 04.02.2013 on the above subject.

List of feeders, which may be opened in case of emergency for Grid Security, was finalised and submitted in the meeting organised by NRLDC on 8th August 2012. In order dated 17.08.2012 of Hon'ble CERC passed in petition no.: 125/NP/2012 at 10(b) it has been mentioned that the representative of NRLDC clarified that as per grid code, it is the responsibility of State Transmission Utility to go for the Automatic Demand Management (ADM) scheme.

As the ADM scheme and GSES system are to be implemented in the whole region for security of grid, these schemes should be introduced as the unified scheme, as SCADA has been developed, to have uniformity of the scheme.

The template prepared by POSOCO, considering various scenarios for load shedding when the power system could be under stress, seems to be in order.

8/2/13

(**Ramesh Mehta**)
Chief Engineer (Power System)
SLDC

दिल्ली ट्रांस्को लिमिटेड
DELHI TRANSCO LIMITED
पंजीकृत कार्यालय :शक्ति सदन, कोटला रोड, न्यू दिल्ली-110002
(Regd. Office Shakti Sadan, Kotla Road, New Delhi-110002)
कार्यालय उपमहाप्रबंधक (एस.ओ.)
Office of Dy. General Manager (SO)
एस एल डी सी बिल्डिंग, मिंटो रोड़, न्यू दिल्ली-110002
SLDC Building, Minto Road, New Delhi-110002
Ph: 23221149 FAX No.23221012

No. F./DTL/207/12-13/DGM(SO)/370 **Dated : 12.02.2013**

To
Superintending Engineer (Operations)
Northern Regional Power Committee
Katwaria Sarai, New Delhi-110016

Subject : Implementation of Grid Security Expert System (GSES) and Automatic Demand Management Scheme.

Dear sir,

This is in reference to meeting held on 07.02.2013 at NRPC on the subject. Delhi SLDC, Delhi STU and Delhi Discoms were present in the meeting. The views of Distribution Companies on the system have already been expressed by the representatives in the meeting. The details provided by TPDDL on behalf of Delhi Discoms are as under :-

"

1. Grid collapse incidents on 30th and 31st July 2012 were because of combination of factors as the report suggests on this matter. The main issues highlighted in the report are:
    a. Lack of coordinated outage planning in transmission system
    b. Lack of generator response with change in frequency
    c. Defective protection settings on important lines
    d. Lack of desired load relief through UFR and df/dt
    e. Role of LDCs in understanding the situation

    We request for early resolution of all the issues mentioned in the report including above ones. We believe that existing defence mechanisms are sufficient enough. The need is to improve the compliance level and improve the existing infrastructure, rather than putting additional defence layers.

    We also submit that there should be an independent control agency to oversee all IEGC and other regulations compliance issues pertaining to generators and transmission companies.
2. Almost all the mechanisms proposed under the GSES mainly suggest for load management at DIscom end to control grid parameters. There seems to be an indication that load management is the only solution to safeguard grid from any disturbance. There is no mechanism proposed for:
    a. Automatic control over Generators ramp-up/ramp-down as per system requirement (and as per IEGC)
    b. Automatic controlling reactive power compensation devices and OLTCs at transmission level

c. Automatic opening and closing of transmission lines as per prevailing voltage conditions
d. Automatic reactive power compensation by generators

We feel that above measures are equally important in case of any grid disturbance. Above measures could well be adopted by using existing infrastructure by LDCs.

3. Grid Security Expert System (GSES), as proposed by POSOCO, mainly appears to be a duplication of already existing defence mechanisms in the system. In Delhi, Discoms have already developed and successfully tested "State of the Art Load Management Scheme" as envisaged under IEGC. PLC based UFR and df/dt load management is also in place at DTL end. These schemes have been designed in such a way that most of the critical and important loads have been exempted from shedding. Any new mechanism will not only be an additional burden to Delhi consumers but may also disrupt supply to critical installations.
4. Therefore, there is no necessity of additional control for above activity, rather it is required to improve:
    a. Accuracy and timely updation of Scheduling by NRLDC/SLDC
    b. Accuracy of measurement of grid parameters
    c. Connectivity and data transfer by expediting interconnection of SLDC and DISCOM SCADA for better monitoring.
5. There are provisions of automatic load disconnection at Discom Level to limit overloading of elements inside the Discom Limits. Since, all the loads are managed through centrallised control centre, there is no delay in execution of load disconnection in case of any element overloading in the system. Further, SPS have been implemented in Delhi system wherever required.
6. The Delhi Islanding scheme has been finalised and necessary requirements are being met by all Discoms, therefore, an additional system would only complicate the existing scheme.

Keeping the above comments in view, Delhi Discoms feel that this scheme would not add any value in the system protection and monitoring in Delhi Area. This would only add to cost to be borne by consumers and unnecessary load disconnections. Therefore, we strongly feel that this should not be implemented in the Delhi area.

Regards
P.Devanand **"**

Delhi SLDC is of the view that while implementing the GSES and Automatic Load Management Schemes, the already finalized Delhi Islanding Scheme should not be disturbed.

Thanking you.

Yours faithfully,

(V. VENUGOPAL)
Dy. G.M. (System Operation)

Copy for favour of kind information to :

1. Chairperson, New Delhi Municipal Council, Palika Kendra, Sansad Marg, New Delhi
2. Member Secretary, NRPC, Katwaria Sarai, New Delhi-110016
3. Director (Operations), DTL
4. G.M. (NRLDC)
5. G. M, (SLDC)
6. CEO, BSES Rajdhani Power Ltd, BSES Bhawan, Nehru Place, New Delhi-110019
7. CEO, BSES Yamuna Power Ltd, Shakti Kiran Building, Karkardooma, New Delhi-92
8. CEO, Power System Operation Corporation (POSOCO), B-9, Qutub Institutional Area, Katwaria Sarai, New Delhi-110016
9. CEO, TPDDL, 33kV Grid S/Stn, Hudson Lane, Kingsway Camp, Delhi-110009
10. Chief Engineer(Utilities),CWE, MES, Kotwali Road, Near Gopi Nath Bazar, Delhi Cantt New Delhi-110010
11. Addl. Secretary (Power), Govt. of NCT of Delhi, Delhi Secretariat, New Delhi
12. Dy. G.M. (SCADA), Delhi SLDC
13. Manager (SO), Delhi SLDC

The Member Secretary,
Northern Regional power Committee,(NRPC),
Govt. Of India,
18-A, Shaheed Jeet Singh Marg,
Katwaria Sarai,
New Delhi 110016.

No:JKSPDC/TECH/7568
Dt:11.02.2013

Subject: Compliance to directions of Hon'ble CERC - meeting to finalise the views of NRPC on (i) Grid Security Expert System (GSES)" and to (ii) discuss Automatic Demand Management Scheme.

Reference: Your letter NO: NRPC/OPR/113/05/2013 dated 01.02.2013.

Sir,

Jammu and Kashmir Power Development Corporation (JKSPDCL) a generating company of the state of Jammu and Kashmir, has the following comments/observations to make with regard to implementation of GSES and Automatic Demand Management System which are vital for ensuring Grid security and reliability of Power.

1. A set criteria needs to be in place for reduction of generation from the power station feeding the system in case of any load throw, resulting in high frequency and over voltage. All the generating stations should lower the generations proportionately to their capacities in the event of load throw or otherwise norms should be fixed for implementation by the generating companies.
2. Compensation of the loss, which would occur to the generating companies on account of sudden load throw in the event of opening of lines etc. due to overdrawals of power by the different entities connected with the system. Especially in the case of ROR Hydel schemes where spillage of water means a direct loss of revenue. It requires to be seen in the perspective of the long term/short term PPA which JKSPDCL has with other utilities through PTC. Negligence on part of one entity would cause revenue loss to the generating company for no fault of theirs.

The above two observations need to be considered, so that the particular generating company do not suffer on this account.

Yours Faithfully,

Deputy General Manager (E),
Coroprate Office,
JKSPDCL.

Copy to:-

1. PS to MD for information to the managing Director.

PUNJAB STATE TRANSMISSION CORPORATION LIMITED
OFFICE OF CHIEF ENGINEER/SLDC, SLDC BUILDING
220KV SUB STATION, ABLOWAL, PATIALA
PH. NO. 0175-2366007, FAX NO. 0175-2365340

To

General Manager,
Power System Operation Corporation Ltd.,
NRLDC, B-9, Qutab Institutional Area,
KatwariaSarai, New Delhi.

Memo No. 42 / T-257

Dated: **01.02.2013**

Subject: Automatic Defence Plans for the All India Electricity Grids.

Ref: Your office letter No. POSOCO/NLDC dated 11th Sept. 2012.

On the draft template prepared by Power grid the point-wise observations of SLDC Punjab are given hereunder:-

1. List of radial feeders/feeders in identified groups for automatic disconnection of load on rotational basis is enclosed. It is added that the GSES Scheme now proposed may to wired to open the existing breakers covered under any UFR and df/dt schemes.

2. The GSES scheme should only be limited to the load shedding.To reduce the generation through a remote command may interfere with the RGMO/FGMO mode of operation of machines.

3. The selection of feeders for under voltage load shedding should be limited to high MVAR drawing feeders. The existing load shedding schemes already in existence need to be reviewed in the above context.

4. The feeders already covered under each SPS Scheme should also be wired for Stage-I automatic load shedding under GSES.

5. Load shedding should only be carried out through the proposed GSES Scheme. The control of Generating Units should remain at plant level on manual mode or through FMGO mode.

6. As per the comments at Sr. No. 4.

7. The selection of feeders for angular displacement should be as per the requirement of the system instead of opening of groups on rotational basis.

8. The setting of UFR should be reviewed w.r.t. the existing operating range of system frequency. GSES logic should be applied to the existing UFR based feeder for stage-I load shedding and the existing UFR relays should remain to be wired for a back up stage-2 load shedding.

9. GSES Scheme logic should be applied to the existing df/dt based load shedding feeders and should be wired for stage-II load shedding.

10. Islanding scheme is being dealt separately.

Chief Engineer/SLDC,
PSTCL, Patiala.

19/2/13

LIST OF 220KV RADIAL FEEDERS UNDER PSTCL PATIALA FOR EMERGENCY LOAD SHEDDING

Sr. No.	Name of the Feeders		Load (MW)	Mobile No.	Micro wave
	220KV Feeders	**66KV Feeders (effected area)**		**96461-**	
1.	220KV Lehra Mohabbat-Himmatpura ckt.-1&2	66KV Patoheera Singh, Tullewal, Bilaspur, Dena Sahib, Bhadaur	80	17031	500420
2.	220KV Muktsar-Gubaya	66KV Dhandi Qdeem, Fazlika, Laduka, Bairoke Jhariwala, Jiwan Arian.	90	12244	503401
3.	220KV Pakhowal-Mehal Kalan	66KV Mehal Kalan(Kutba), Thikriwala, Thuliwal.	50	12211	-
4.	220KV Patti-Algaon	66KV Amarkot, Lakhna, Khem Karan.	40	12212	-
	Total		**260**		
	132KV Feeders				
1.	132KV Moga(220KV) - Badni Kalan	11KV 16no. feeders i.e Bhadri kalan, Buttar, Ralian 1&2, Badhni khurd , Maleana, MHP, Agami, Ralian 3&4 etc.	20	12258	500411
2.	132KV Moga(220KV) - Moga-II (Dhale Ke) – Dharmkot	66KV Amiwal, Dholewal, Fate Garh Punjtoor, Kot Isse Khan. 11KV 11no. feeders i.e Ratian (UPS), Landake City, Ratian (Rural), Suraj nagar (Factory area) & Local Load of Dharamkot S/S etc.	80	12258	500411
3.	132KV Moga (220KV) – Golian Kalan – Samad Bhai	66KV Bhagtabhai & 18no.11KV feeders Local Load of Samadh Bhai & Gholian.	24	12258	500411

4.	132KV Bhatinda – IGC – Maur	66kv Bardhman, Dhabwali, Kot shamir, 66KV Talwandi, Rama, Jagga Ram Tirth, Bangi & 11KV Local Load.	70	21965	500405
5.	132KV Malout-Abohar	66KV MES, Khui Khera, Kheowali Dhab & Local 11KV feeders 16 no.	60	12250	-
6.	132KV Muktsar-Jalalabad	66KV Bajeke, Nureke & 11KV Local 18 no.feeders.	25	12244	503401
7.	132KV Sadiq-Faridkot	Local area, 11KV 13no.feeders.	10	12257	-
8.	132KV Doraha-Bilaspur-Sihora	Local area 10no. 11KV feeders.	15	12195	-
9.	132KV Patti(220KV) - Bhikhiwind	66KV Sur Singh, Marhi-Mega & Local area 11KV feeders 11no.	45	12212	-
10.	132KV Verpal (220KV) – Hakima Gate - Skatri Bagh	Local area 11KV feeders 11no. of Hakema Gate & 11no. of Skatri Bagh	18	12206	501406
	Total		**367**		

	LIST OF 66 KV RURAL FEEDERS FOR EMERGENCY RELIEF.				Approx.	
SRNO.	Name of 220/132 kv stns.	PHONE NUMBERS	Name of 66kv stns.	NO. OF FEEDERS	RELIEF (IN MW)	GROUPS
1	220 KV SUNAM	96461 12176	Lehra, Mangwal, Ubhawal, Longowal, Sunam ckt 1&2, Local Grid	7	70	G1
2	132 KV MUKATSAR	96461 12245	Malout Road City, Sattanwala, Lubancwali, Lubana	4	8	
3	220 KV MOGA	96461 12258	Badnikalan, Dhamkot, Kotakroad	3	7	
4	132 KV SAMAD BHAI	96461 12263	Bhagta Bhai	1	9	
5	132 KV NAKODAR	96461 12165	Masunpur	1	1.2	
6	132 KV JADLA	96461 16848	Kathgarh	1	9	
7	132 KV KATHUNANGAL	96461 12222	Sarsika, Nawanpind	2	17	
8	132 KV SRI HARGOBINDPUR	96461 12228	Ghuman, Harjowal, Kadian, Rijan	4	5	
	TOTAL			23	126	
9	220 KV BARNALA	96461 12238	Karamgarh, Pakhoke	2	22	G2
10	220 KV RAJPURA	96461 12173	Saraibanjara, Mohikalan	2	26	
11	220 KV BOTIANWALA	96461 12253	Kamalgarh, Behatgujran, Thatha Sahib, Kasowana, Sabrawan	5	40	
12	220 KV FEROZEPUR	96461 12251	33kv Ghoker Haihar, 33kv Chugate Wala, 33kv Tibbi	3	36	
13	132 KV NAWANSHAHR	96461 12161	Gharshankar	1	1.5	
14	132 KV KAPURTHALA	96461 12156	33kv Kalasnghia, 33kv Ucha, 33kv Hothian, 33kv Tiba	4	8	
	TOTAL			17	134	
15	132 KV KHARAR	96461 12179	Wadali, Majra Mulanpur, Majri, Banur	4	22	G3
16	220 KV BUTARI	96461 12215	Saidpur, Nagoke, Khadur Sahib, Beas	4	25	
17	132 KV BHOGPUR	96461 12151	Begowal,Kala Bakra	2	27.6	
18	132 KV BHIKHIWIND	96461 12213	Sursingh, Marimegha	2	25.7	
19	132 KV ROPAR	96461 12180	Bur Majra, Kurali, Parsali	3	19.2	
20	132 KV TARN-TARAN	96461 12214	Chabal	1	18	
	TOTAL			16	138	
21	220 KV BAHADURGARH	96461 12172	Maghar Sahib, Rodjaghi	2	19	G4
22	220 KV WADALA GRANTHIAN	96461 12227	Udhonangal	1	30	
23	220 KV LALTON KALAN	96461 12186	Narangwal	1	15	
24	220 KV AMLOH	96461 12204	Agaul, Samaspur	2	23	
25	220 KV KOHARA	96461 12201	Kohara Chaura, Kohara Bhani Sahib	2	22	
26	132 KV DHARIWAL	96461 12233	Deriwal	1	10	
27	132 KV DORAHA	96461 12195	Korsen,	1	6.5	
	TOTAL			10	126	

NOTE:

1 The total 66KV Rural feeders which are not covered under any other load shedding scheme have been grouped in 4 groups to approximate 125 MW relief per group.

2 As per Minutes of Meeting dated 07/08/2012, the average load of 5074 MW & 43000 Mus of annual consumption have been taken into account.

455
14/2/13

दिल्ली ट्रांस्को लिमिटेड
DELHI TRANSCO LTD.
(रजिस्टर्ड कार्यालय : शक्ति सदन का. इंदरजीत गुप्ता मार्ग, नई दिल्ली -११०००२)
(Regd. Office: Shakti Sadan, Com. Inderjeet Gupta Marg, New Delhi-110002)
Office of General Manager (O&M)-I
220 KV Grid S/Stn. Bldg. Park Street, New Delhi-110001
Tele. No. 011-23366462, Fax No. 011-23366160

No. L.DTL/F22/206/2012-13/Oprs (O&M)I/ 219 Dated 11st February' 2013

Member Secretary,
Northern Regional Power Committee,
18-A, Shaheed Jeet Singh Marg,
Katwaria Sarai,
New Delhi: 110016.

Sub: Compliance of directions of Hon'ble CERC – meeting to finalise the views of NRPC on (i) Grid Security Expert System (GSES)" and to (ii) discuss Automatic Demand Management Scheme – regarding.

This is with reference to the discussions held in the meeting on 7th February'2012 at NRPC Secretariat. The following three scenarios, as part of the automatic defense plans for secure portion of the grid are collectively being addressed by DTL by installing and commissioning the under frequency and df/dt numerical relays at 30 grid substations.

1. Flat frequency under frequency relays (UFRs)
2. Rate of change of frequency or df/dt relays
3. Islanding schemes

The islanding scheme approved by Ministry of Power, Govt. of India is being implemented by Power Grid Corporation of India and will be in place by 3rd week of March'2013. Considering that PGCIL will be implementing the Grid Security Expert System for different states, it is requested that PGCIL, who is also commissioning the UFR, df/dt and Islanding scheme for the state of Delhi may ensure that these schemes should dovetailed with the Grid Security Expert System in the future.

As regards, the other scenarios under the automatic defense plans, the views of SLDC, Delhi and distribution companies were already discussed during the meeting.

(Prem Prakash) 11/02/2013
General Manager (O&M)-I

MK Padhi
14/2
SE(O)

एन एच पी सी लिमिटेड
(भारत सरकार का उद्यम)
NHPC Limited
(A Govt. of India Enterprise)

O&M DIVISION
NHPC OFFICE COMPLEX
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HARYANA- 121003
Ph. 91-129-2250427
FAX:91-129-2272413/1419

NH/O&M/COM/15/97 **06/02/2013**

The S. E. (Operation),
Northern Region Power Committee (NRPC),
18-A, Shaheed Jeet Singh Marg,
Katwaria Sarai,
New Delhi-110016

Sub: Grid Security Expert System (GSES): Effects of provision proposed for Automatic Generation reduction at Generating Stations.

Ref: Your letter no NRPC/OPR/113/05/2013 dated 01.02.2013.

Sir,

This has reference to your above referred letter, wherein it was requested to provide comments on GSES for the meeting to be held on 07th February '2013.

Accordingly, after going through the draft schemes following are the comments of NHPC:

1. It has been noticed that majority of grid disturbances are due to overdrawal of load and not due to over injection. There is a shortfall of energy and under the present scenario, backing down of generation of any power station is improper. Further with integration of national grid, shortfall in any region can be met from the other region.

2. The generation from power stations is already covered under FGMO/ RGMO as stipulated in IEGC. The schedules are being given by RLDC's and machines are being operated accordingly. Controlling of generation either by SLDC or RLDC is highly unsafe and complicated issue when being done through Remote system.

3. The proposed "Digital Tele Protection Coupler" (DTPC) shall be implemented by the help of optical fibers and hence consequent cyber security/sabotage aspects cannot be completely ruled out.

4. In case of ROR schemes , reduction of power shall always cause spillage of water and loss of zero cost energy. Further backing down of generation may force the machines into unwanted zone of operation which will cause excessive vibration and subsequent damage to the machine. In case of Hydro machines, control of generation from each unit may only be done by the operator of the Power Station. By any other system, units can only be tripped as an Emergency Shut Down.

5. It is impractical to control all the generators by SLDC/RLDC from a single remote point. It may make the power generation environment more complicated. A better management of power, strictly as per requirement of grid and creating an alarm in case of violation, may be considered instead of going for directly controlling power generation.

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(भारत सरकार का उद्यम)
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(A Govt. of India Enterprise)

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6 NHPC is of the view that in the first stage, the load shedding control scheme by disconnecting the feeders may be adopted as a pilot project by SLDC's/RLDC's and further action be taken accordingly based on the feedback of pilot project.

This is for kind consideration and further action at your end.

Thanking you,

Yours faithfully,

6/2/13

(S P Singh)
Chief Engineer (O&M)-I

HIMACHAL PRADESH LOAD DESPATCH SOCIETY

NO.HPLDS/ Misc /2013-435 Dated: 12.2.2013

To

The Superintending Engineer(Operation)
NRPC, 18-A Shaheed Jeet Singh Marg,
Katwaria Sarai, New Delhi – 110016.

Subject: Comments on proposed Grid Security Expert system (GSES)

The Para wise comments are as under :-

1. Logic: Two groups A&B have been proposed. Since other S/Stations are of lower capacity. To have higher capacity, adjoining S/Station may be grouped and made additional node pts.
2. Over-injection/under-drawl : No comments.
3. Under-Voltage: As far as under voltage logic is concerned, this office confirms the proposed action, but it is submitted that under-voltage problem is quite rampant during paddy growing season i.e. the month of July & August which is largely due to reactive power compensation. This point may please be taken care of.
4. Line loading crossing set limits: Agreed.
5. Power flows exceeding total transfer capability (TTC): Agreed
6. ICT/Line loading crossing normal operating limits: Ok agreed.
7. Flow crossing TTC: Ok agreed
8. Sudden loss of Generation: Himachal Pradesh has only Hydro Power and their power can not be increased instantly.
9. Angular difference exceeding cut-off value: Agreed.
10. UFRs and Df/dt: Agreed to the proposal.

Thanking you

Yours faithfully,

Sd/-

Superintending Engineer (SLDC),
H.P. Load Despatch Society,
Totu, Shimla – 171011.

From :- Rajasathan, SLDC

To,

1. **The Superintending Engineer (Opr.), NRPC,New Delhi.**
2. **The G.M. (NRLDC), New Delhi.**

Sub :-Comments on automated defense plan (Grid Security Expert system) for secure operation of the grid prepared by NLDC.

1. **Overdrawl :-**As per GSES scheme the 60% of peak load has to be considered for load shedding to control the overdrawl when the system frequency is falling below 50.00 hz. It is presumed that 40% of peak load has been considered to cater the emergency & necessary load having concerned with hospitals, defense and other emergency requirements. In this context, it is to mention that clause 5.4.2 (d) of IEGC specifies the similar type of load shedding scheme to be made effective by State Electricity Boards/ distribution licensees through SLDC for maintaining the drawl within schedule automatically. Since both the schemes are identical in nature for managing the overdrawl from the schedule, therefore, both may be merged in one proposed scheme to avoid financial burden to the distribution licensees which is ultimately have to borne by the consumers.

2. **Over injection / underdrawl :-** It was apprised by POSOCO during the special meeting of NRPC on 7th Feb. 2013 at New Delhi that alert signal would be sent to the state generating stations for controlling the over injection / under drawl of the State and accordingly generator have to reduce their generation manually. Whereas scheme states for automatic reduction in generation which is contradictory to each other and needs to be clarified/ rectified.

3. **Flat frequency under frequency relays** :- The load to be shed through under frequency relays at different frequency settings as stated in the scheme indicates that the load which is considered for controlling the overdrawl at frequency 50 Hz and below has also been considered for UFRs which is contradict to the clause No. 5.4.2 (e) of the IEGC and during contingency proper load relief would not be made available through the defense mechanism of under frequency relay in case of overdrawing states.

4. **Islanding scheme :-** Though it has been stated in the GSES scheme that automatic islanding scheme at 47.9 Hz or below through UFRs to isolate power stations with matching load would be formulated at RPC forums but which load is to be considered for the islanding scheme under GSES scheme has not been specified, whether the load considered for load shedding for overdrawl would also be considered for the islanding schemes or otherwise.

5. High voltage contingency :- The GSES scheme is silent for high voltage grid contingency which should also be taken care of.

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To

The Member Secretary / NRPC
Northern Regional Power Committee
18-A, Shaheed Jeet Singh Marg, Katwaria Sarai,
New Delhi- 110016

Memo no.: Ch-15 /PC- 11/Vol-1 /SLDC/OP Dated: 20.02.13

Sub: Comments on Automatic Demand Management Scheme and Grid Security Expert System.

In this connection the comments of HVPNL are as under:-

Since all ten scenarios of Grid Security Expert System (Overdrawals, Over-injection/Under-drawal, Under voltage, Line loading crossing set limits, Power flows exceeding total transfer Capability, Loss of generation exceeding 1000 MW or loss of high capacity transmission corridor, Angular separation, Flat frequency under Frequency Relays, df/dt relays & islanding schemes) involve Automatic feeders disconnection, therefore there is no need of implementing automatic demand management scheme by the states where the scheme is yet to be implemented. The GSES is to be implemented by POSOCO in three years time and if states also proceed with separate automatic demand management scheme it may result in duplicity and financial loss.

The backing down in Generation would be implemented by sending a signal or alarm (indicative provision only) by GSES and there would be no automatic variation of Generation which will be done manually by Generating station on receiving the signal. The same can be intimated telephonically also and there is no need of GSES to give signal only to Generating Station.

In view of above the implementation of GSES and Automatic demand management scheme may be reviewed please.

The comments of Discoms/HPPC are also enclosed for further necessary action please.

DA: As above.

Superintending Engineer/SLDC/OP

CC:

(i) SPS to Managing Director, HVPNL for kind information of Managing Director, HVPNL Panchkula please.
(ii) PS to Director/Technical, HVPNL for information of Director/Technical, HVPNL, Panchkula.
(iii) PS to Director/Project, HVPNL for information of Director/Project, HVPNL, Panchkula.
(iv) The Chief Engineer/SO & Comml. HVPNL, Panchkula

UTTAR HARYANA BIJLI VITRAN NIGAM LIMITED
(A Govt. of Haryana Undertaking) Regd. Office C-16, Vidyut Sadan, Sector-6, Panchkula, Haryana, Office of GM/System Operation, UHBVN, Panchkula, Email – sesouhbvn@yahoo.com Ph. No. 0172-3019159, 3019165
Fax- 0172-3019169

14

To

Chief Engineer/ SO & Comml
HVPN, Panchkula

DIARY No. 126
PA/CE/SO & COMML
DATED 13/2/13

Memo No. Ch-39/SE/So-25/CERC
Dated: 12/2/13

Subject: **CERC order dated 17.8.12 on petition no. 125/MP/2012 along with nos. 25/2012, 35/2012, 38/2012 & 45/2012 in the matter of effecting load management by Northern Region constituents and curbing in terms of the Indian Electricity Grid Code and Unscheduled Charges Regulations.**

AND

Resolutions adopted in Ministry of power meeting dated 06.08.2012 to discuss Grid disturbance on 30.7.2012 and 31.7.2012.

This is with reference to your office memo no. Ch-41/PC-11A/SLDC/OP dated 15.11.2012 on the above cited subject.

The comments of this office are as under:

SE/Comml
SE/SLDC

LOAD FORECASTING:

Demand forecasting and power planning is being done for long term, medium term and short term (day ahead basis) in consultation with HVPN.

AUTOMATIC LOAD MANAGEMENT SCHEME:

Presently, DISCOMs are manually shedding the load as per the system requirement & as per the ISGS/ IEGC guidelines and efforts are being made to minimize the response time. However, Automatic Load Shedding is implementable at 66KV and above level by providing PLC as indicated in Grid Security Expert System of Automated Defence Plan for secure operation of the Grids as circulated by POSOCO (copy placed as Flag-B) at SLDC level.

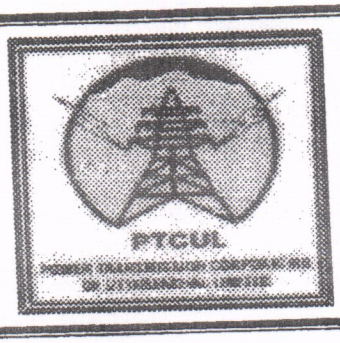
The DISCOMs will however extend all possible help for framing the rotational load shedding groups.

This issues with the approval of CMD, UHBVN & DHBVN

General Manager/ SO
for Chief Engineer
HPPC, Panchkula

CC:- CE/HPPC, Panchkula

अधीक्षण अभियन्ता
नियंत्रण,
ऋषिकेश
-249202
:- 2451775
:- 2451160



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Sc2 /SLDC(R)/Grid Discipline

Dated: 28.09.2012

Managing Director,
UPCL,
Urja Bhawan, Dehradun.

Sub. : **Draft of the Automatic Demand Management Scheme for Uttarakhand State.**

Regarding subject as above, as per CERC guidelines for implementation of Automatic Load Management Scheme Uttarakhand SLDC has framed a draft of implementation Automatic Load Management Scheme as per the enclosure.

You will appreciate that the complete Automatic Load Management may be achieved only after installation of SCADA system at all 33 KV Substations along-with developing logic & software for Automatic Load Management and monitoring the drawl as per schedule of Uttarakhand. UPCL shall take up this work at war footing level and implement the same expeditiously, and give a time bound programme to SLDC & UERC.

Till the time complete SCADA base Automatic Load Management is achieved the present Manual Disconnection Scheme can be made faster and smoother with the help of computer generated mobile base group messages. The complete scheme for making faster manual load management to avoid violation of the regulation is hereby being enclosed.

You are requested to kindly direct the concerned officers/officials to furnish the information as required and comply with the directions of SLDC detailed in the draft. The non compliance of the directions will be presumed as violation of Sec. 33(1) & 33(2) of Electricity Act, 2003 regulations and SLDC will be forced to approach to Hon'ble UERC for taking action as per Electricity Act, 2003 Sec. 33(5).

Encls. : As above

(Rajiv Gupta)
Superintending Engineer

Letter no. Sc2 **/SLDC(R)/Grid Discipline of dated**

1. Hon'ble Secretary, UERC, Dehradun.
2. PS to MD, PTCUL, Dehradun for kind information of MD, PTCUL.
3. Director (Operation), PTCUL/UPCL, Dehradun.
4. Executive Director (Com), UPCL, Urja Bhawan, Dehradun.

(Rajiv Gupta)
Superintending Engineer

AUTOMATIC LOAD MANAGEMENT/DEMAND DISCONNECTION SCHEME FOR UTTARAKHAND STATE

INFORMATION AND DATA REQIRED FROM UPCL :-

1. Estimated category wise load of Uttarakhand State e.g. rural, small town, big town, furnaces, continuous & non continuous industries etc.
2. List of 33 KV secondary substations which can be disconnected immediately without affecting any critical/emergency load e.g. water works, military services, railways & continuous industries etc along with the name of primary substation from where it is being catered.
3. The maximum & average load of the 33 KV secondary substations as per point no.-2
4. Making a group of 33 KV substation by dividing them in 4 or more different groups along-with their priority during load disconnection. In such a way that each group shall give a minimum relief of 50 MW.
5. List of 33 KV feeders emanating from primary substations which can be made to open without affecting critical/emergency services and which shall be made to opened when sufficient relief is not obtained by opening load of group of 33 KV secondary substations as per the list in the point no.-4. These 33 KV feeders shall not coincide with the list of 33 KV substations as per point no.-2.

DRAFT OF THE IMPLEMENTATION OF THE AUTOMATIC LOAD DISCONNECTION SCHEME :-

(a) After getting information sought as above SLDC will rearrange 4 or more groups of 33 KV Substations as per the list of the point no.-2, so that each group shall give a relief of 50 MW in one time without affecting loading pattern of primary substations.

(b) SLDC will fix the priorities and the number of hours of opening the load in consultation with UPCL.

(c) UPCL shall constitute their control & monitoring officers/officials group which will work in co-ordination with SLDC and will

monitor drawl & schedule of Uttarakhand State in real time round the clock.

(d) Whenever there is a significant gap between demand & schedule (more than 12% of schedule in block of 15 mints) SLDC will flash message to control & monitoring group as constituted by UPCL to reduce the load by opening groups of 33 KV secondary substations. This load disconnection can also be implemented by UPCL on their own decision without waiting for our instructions under intimation to SLDC while monitoring demand schedule gap.

(e) This load disconnection shall be implemented by UPCL by giving messages to concerned EE/SDO/JE & SSO incharge of the secondary substations as per the framed group.

(f) The procedure of flashing messages to concerned EE/SDO/JE & SSO incharge of the UPCL shall be simultaneous computer generated to reduce the load relief time.

(g) SLDC will watch that even after 5-10 minutes of instructions given to reduced load, if the desired relief is not obtained then SLDC will pass message to primary substations for opening the feeders as per the list of point no.-4.

(h) After exercising the load disconnection scheme as designed above, if the sufficient relief is not obtained and frequency goes below 49.5 hz., then SLDC will implement its own contingency plan for getting relief by opening 132 KV substations as per plan.

(i) UPCL shall ensure that overdrawal does not exceed beyond prescribed limit as per regulation.

The above proposal is submitted to Hon'ble UERC as per the discussions held during the meeting dated 11.09.12 afternoon.

(Rajiv Gupta)
Superintending Engineer

वर ट्रांसमिशन कारपोरेशन ऑफ उत्तराखण्ड लि०

अधीक्षण अभियन्ता
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461 /SLDC(R)/Grid Discipline Dated: 30.08.2012

Managing Director,
UPCL,
Urja Bhawan, Dehradun.

Sub. : **Regarding preparation of Automatic Demand Disconnection Scheme.**

Regarding subject as above, kindly find enclosed herewith extracts of the copy of order dated 17.08.12 against Petition No. - 125/MP/2012 issued by Hon'ble CERC. In the order of Hon'ble CERC regarding violations of various messages as per Grid Code has been taken very seriously and Officers Incharge of SLDC & STU has been held responsible for overdrawing during low Grid frequencies in real time. Hon'ble Commission has also ordered for imposition of penalty against Sec-142 of the Act as per Grid Code. Besides this Commission has also ordered SLDC to prepare Automatic Demand Disconnection Schemes through the distribution companies as per regulation 5.4.2(d).

This is to apprise your good self that SLDC Uttarakhand has been asking with UPCL vide our different letter nos. 703/SLDC(R)/CERC dated 17.12.11, 537/SLDC(R)/CERC dated 29.12.11, 148/SLDC(R)/Grid Operation dated 12.04.12, 166/SLDC(R)/Grid Operation dated 19.04.12, 195/SLDC(R)/Grid Operation dated 01.05.12, 200/SLDC(R)/NRLDC dated 08.5 12 & 201/ SLDC(R)/ Grid Operation dated 09.05.12 for providing necessary and relevant information regarding quantity & periodicity of load disconnection during low frequencies feeder-wise as well as category-wise but the same has not made available to us. We hereby are again asking for different informations listed as below, so that we can prepare & formulate the Automatic Demand Disconnection Scheme, which can be implemented by UPCL :-

1. Category-wise load e.g. Rural, Small Town, Big Town, Continuous/ Non continuous industries etc.
2. List of 33 KV secondary substations, which can be disconnected immediately without affecting any critical/emergency services load.
3. The maximum & average load of the 33 KV secondary substations as per point no.-2
4. Making a group of such 33 KV substations by dividing them in 4 different groups along-with their priority during load disconnection, so that each group shall give a minimum relief of 50 MW.
5. List of 33 KV feeders, which can be made to open without affecting critical /emergency services which can be made to open when sufficient relief is not sought by opening load as per the list in the point no.-4.

It is requested that all the above point-wise information shall be furnished to SLDC, so that Automatic Demand Disconnection Scheme can be prepared and got implemented in the real time with the help of SCADA infra-structure.

(Rajiv Gupta)
Superintending Engineer

Letter no. 461 **/SLDC(R)/Grid Discipline of dated**

1. Secretary, Hon'ble, UERC, Dehradun.
2. Director (Operation), PTCUL/UPCL, Dehradun
3. Executive Director (Com), UPCL, Urja Bhawan, Dehradun.

(Rajiv Gupta)
Superintending Engineer

पावर ट्रांसमिशन कारपोरेशन ऑफ उत्तराखण्ड लि0

कार्यालय अधीक्षण अभियन्ता
प्रणाली नियंत्रण,
132 के0वी उपकेन्द्र,मुख्यालय भवन मा
देहरादून–248001
मो0 :– 9837893749

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132 KV S/s H/Q Building Majra,
Dehradun-248001
Email : sldc@ptcul.org

Letter No. 84 /SLDC(D)/NRPC ~~Dated: /02/2013~~ Dated : 05/02/2013

E-mail: nrebops@yahoo.com

Sub:-Compliance to directions of Hon'ble CERCE – meeting to finalise the view of NRPC on (i) Grid Security Expert System (GSES) and to (ii) discuss Automatic Demand Management Scheme .

Ref:- NRPC/OPR/113/05/2013 Dated 01.02.2013

Member Secretary
NRPC
18-A, Shaheed Jeet Singh Marg
Katwaria Sarai, New Delhi

Dear Sir

Regarding Subject as above, as per CERC guidelines for implementation of automatic Load Management Scheme, Uttrakhand SLDC has frame a draft of implementation of automatic Load Management Scheme (Enclosed)also, for effective implementation of the scheme certain requisite informations have been sought from DISCOM (UPCL) (Copy of letter no. 461/SLDC(R)/Grid discipline dated 30.08.12 and letter no. 502/SLDC(R)/Grid discipline dated 28.09.2012 enclosed). The reply of the same is still awaited.

On the matter of GSES, Uttrakhand state is of the view that a Nodal agency may be formed to monitor the Grid Security and all members(SLDC,s/STU,s) will report to same and will provide requisite information as desired by Nodal Agency.

Submitted for your kind consideration.

Encls:- As above.

(Anil Kumar)
Superintending Engineer (SO)

No. /SLDC(D)/PTCUL/ **Dated:-**

Copy forwarded to the following

1. MD, UPCL, Dehradun for the kind information.
2. Director (Operation), PTCUL, H/Q Building Majra, Dehradun.
3. Director (Operation), UPCL, UrjaBhawn Complex, Dehradun with the request to take cognizance of the letters cited above and submit the response of the letters so that NRPC may be apprised further.

(Anil Kumar)
Superintending Engineer (SO)