No. : WRPC/Prot./1st GSES / 2013 /  

Sub :- Minutes of 1st Meeting of Group to Implement GSES & ADMS, held on 22nd April 2013 at WRLDC, Mumbai.

Sir,

This letter is to inform you about the minutes of the 1st Meeting of Group to Implement GSES (Grid Security Expert System) & ADMS (Automatic Demand Management Scheme) held on 22nd April 2013 at WRLDC, Mumbai. Minutes are also available at WRP Committee website www.wrpc.gov.in for your information and necessary action.

Minutes are also available at WRP Committee website www.wrpc.gov.in for your information and necessary action.

Yours faithfully,

(M.M.Dhakate)

(As above)
Ist GSES Meeting MAIL LIST

1) Chief Engineer (LD), MSETCL, Kalwa. Fax-27601769/65
2) Chief Engr. (Trans O&M), MSETCL, Bandra. Fax No. 022 26598587.
3) S.E. (T&C), MSETCL, Aurangabad Fax-0240-2234220 /2346290
4) S.E (T&C), MSETCL, Pune. Fax-9520-2617532/2612342
5) S.E. (T&C), MSETCL, Nagpur. Fax-95712-223420
6) S.E(T&C), MSETCL, Pune. Fax-9520-2617532/2612342
7) S.E.(T&C), MSETCL, Vashi Fax--022-27662055
8) S.E.(Gen.Tstg), MSPGCL,Eklahre, Nasik Fax-95253-2810496/2810499
9) S.E. (Task Force), MSPGCL, Nagpur Fax- 0712-2591717.
10) S.E.(TCC), MSETCL, Karad. Fax.No. 02164 255118
11) Chief Engineer (Gen), GSECL, H.O. Baroda. Fax-0265-5512129/2344537
12) Addl. C.E.(Testing), GETCO, Baroda. Fax-0265-2535128
13) Chief Engineer(LD), MPPTCL, Jabalpur. Fax-0761- 2664343 /2282632.
14) E.D. (T&C),MPPTCL, Jabalpur. fax-0761-2661696
15) Addl.C.E., MPPGCL, Jabalpur Fax- 0761-2660063/2665805
16) Chief Engineer (LD), CSPTCL, Bhiilai. Fax-0788-2282632/0788-383633
17) C.E. (T&C), CSEB, Raipur.Fax-0771-4066988/07759-262227
18) EE (T) , CSPGCL.- Fax.No. 07789-226227
19) S.E.(T&C), CSPTCL, Bhiilai. Fax.No. 0788 2281
20) S.E.(T&C), CSPTCL, Raipur. Fax No.0771-4066988.
21) E.E.(T&C), CSPTCL, Bhiilai. Fax No. -0788 2281
22) EE, Division VIII(MRT),Elect. Dept; Goa Fax 0832-2735124.
23) Supdt.Engr., Electricity Dept., DNH, Silvasa. Fax : 0260-2642338
24) Executive Engr., Electricity Dept. DD. Fax : 0260-2250889
25) D.G.M.(O.S. ),N.T.P.C., Mumbai, Fax- 28216692
26) D.G.M.(EM), KSTPS, NTPC, Korba Fax 07759-233088/ 232440
27) DGM (EMD), VSTPS, NTPC, Vindhyachal Fax-07805-247713
28) DGM (EM-I), NTPC, SIPAT Fax-07752-246506/246691.
29) AGM(O&M), KGPP, Adityanagar, Surat Fax 0261-2861428/2861433
30) Sr.Supdt. (EM), Gandhar, NTPC Fax-02642-87402 / 87450
31) DGM (O.S.), WRLDC, Mumbai Fax-28235434
32) DGM, WRTS-I, POWERGRID, Nagpur.Fax-95712-641366/641496
33) Addl General Manager, WRTS-II, POWERGRID, Baroda Fax-0265-2480952
34) SME (E), TAPS-3&4,Tarapur Fax 02252-282001/282073
35) Maintenance Superintendent, TAPS –1 & 2,Tarapur.Fax- 02252-282121
36) SME(E), NPCIL, Kakrapara Fax 02626-234266
37) GM(Maint.). TORRENT Power., AhmedabadFax.079-27506679
38) AGM (ET&A),TPC, Trombay. Fax –022-66687088
39) Dy.Gen. Manager, Dahanu TPS Fax- 952528-222576
40) Vice President, Reliance Energy, Mumbai Fax-30094488
41) GM (Electrical), JPL, Raigarh. Fax.No.7767-281995,281993.
42) AGM(OS), NSPCL, New Delhi . Fax.No.011 26717363/26717366
43) Vice President, APL, Ahmedabad
44) GM, RGIPPL, Anjanwel, Guhlagar, Ratnagiri, Fax.No. 02359 241071
45) GM, JSW Energy Ltd., Jindal Mansion, Mumbai- Fax.No.022 23526400
46) GM, CGPL, Mundra. Fax.No. 02838 661188
47) Director (G M Division), CEA, New Delhi. Fax.No.011-26109750
MINUTES OF 1ST MEETING OF GROUP TO IMPLEMENT GSES ADMS SCHEME

A meeting to discuss the Grid Security Expert System (GSES) scheme and Automatic Demand Management Scheme (ADMS) was held on 22.04.2013 at WRLDC, Mumbai.

The list of participants is enclosed at Annex-1.

Shri U. G. Zalte, Director(Operation), MSETCL chaired the session.

Shri S. D.Taksande, Member Secretary, I/C WRPC welcomed the participants to the meeting. He informed that a meeting was taken by Secretary (Power), MOP on 6th August 2012 after the grid disturbances in NEW Grid in July 2012 and a 12 point resolution was adopted in that meeting. In compliance to point 11 of the resolution namely ‘POSOCO would evolve a contingency load shedding protocol, especially when non frequency related load shedding is required’, NLDC had prepared the GSES proposal.

Further PGCIL had filed a petition with the Hon’ble CERC (Petition 265/MP/2012) seeking the Commission’s approval for implementation of GSES by PGCIL in all the five regions. As per the ROP dated 10th January 2013 under Items 3 & 4 the Hon’ble Commission had directed that the RPCs of all the five regions would also take up the issue of implementation of GSES and ADMS as an agenda item of the RPC meeting within one month from the date of issue of the ROP and file their replies.

Accordingly the issue was taken up in the 22nd meeting of WRPC held in Gandhinagar, held on 26.02.2013 and WRPC had decided that the implementation of GSES and ADMS scheme was agreeable in principle. The relevant extract of MOM of the 22nd WRPC meeting is enclosed at Annex 2. It was decided therein that a Group comprising of representatives of concerned utilities at appropriate levels shall be formed and the group shall deliberate the various aspects of the scheme and place its recommendations to the WRPC for its vetting and approval. A group comprising of representatives from various utilities has been formed and accordingly this meeting has been called.

Member Secretary, I/C WRPC informed that the first NPC meeting was held on 15.04.2013 at New Delhi wherein inter-alia issues pertaining to implementation of Protection Audit and GSES scheme were discussed. He further highlighted the important provisions of CBR of NPC:

a) Decisions taken in NPC shall be considered concurred by respective RPC for implementation
b) Agenda for NPC meeting shall generally be put up after discussions in RPC
c) NPC would take decisions based on majority/general consensus of the strength present

He further informed that the recommendations of this meeting shall be conveyed to NPC. Accordingly in this meeting, representatives from SLDC, DISCOMs, WRLDC, Testing Engineers from STUs and NLDC were invited to discuss the GSES and ADMS with reference the scheme and the decisions of the WRPC meeting. He then requested Shri U. G. Zalte, Director(Operation), MSETCL, to chair the meeting and guide the discussions.
Shri U. G. Zalte, Director(O), MSETCL informed that the implementation of GSES and ADMS scheme in each State was agreed in principle. However the details are required to be deliberated and finalized. While finalizing each state has to consider its own state Regulatory directives, other constraints and yet not sacrifice the power system security aspects.

Thereafter the members deliberated on various aspects of GSES and ADMS and following is the gist of the discussions/decisions of the meeting:

1) Views on Raising additional stage of AUFLS and making the starting stage at 49.0 Hz or 49.2 Hz: The GSES document mentions the four stages i.e. 49 Hz, 48.8 Hz, 48.6 Hz and 48.4 Hz. MS I/c, WRPC informed that in the NPC meeting the first stage was proposed at 49.2 Hz, instead of 49 Hz.

   a) Gujarat recommended to raising the setting of first stage to 49.2 Hz, in view of revised IEGC frequency band of 49.7 to 50.2Hz and availability of large size generators which where no there when 48.8 Hz band was decided. However other constituents opined that first stage of AUFLS may start at 49.0 Hz to allow for manual intervention when frequency fall is not a result of any disturbance. Subsequent raising of set point of first stage may be thought of later after observing the performance.

   b) As a group, the four stages envisaged in the GSES document of NLDC i.e. 49 Hz, 48.8 Hz, 48.6 Hz and 48.4 Hz was agreeable, keeping adequate room for distress load shedding etc.

   c) Regarding quantum of additional relief to be provided at 49.0 Hz, it was thought that each of the lower stages anticipates 1 Hz relief. But the first stage may give relief of 0.5 Hz as it operates at 49 Hz and raise frequency to 49.5 Hz. Thus the additional stage(i.e. 49Hz) requires half the quantum of the load envisaged in the first stage of the Zalte Committee recommendation (load relief in other stages i.e. 48.8,48.6 & 48.2Hz recommended by Zalte Committee need not be changed and the load relief under 48.2Hz stage of Zalte Committee recomendation shall be brought under 48.4Hz stage ) as under:

      | Constituent | At 49.0 Hz (MW) | At 48.8 Hz (MW) | At 48.6 Hz (MW) | At 48.4 Hz (MW) | Total (MW) |
      |-------------|----------------|----------------|----------------|----------------|------------|
      | Gujarat     | 190            | 380            | 384            | 389            | 1343       |
      | MP          | 112            | 224            | 226            | 229            | 791        |
      | Chattisgarh | 48             | 96             | 97             | 98             | 340        |
      | Maharashtra | 286            | 572            | 579            | 585            | 2023       |
      | Goa         | 7              | 14             | 15             | 15             | 51         |
      | DD          | 5              | 9              | 9              | 9              | 32         |
      | DNH         | 10             | 20             | 20             | 20             | 70         |
      | WR(Total)   | 658            | 1315           | 1330           | 1345           | 4648       |

   d) It may be noted that the WR is giving 1.73 times the requirement to account for voltage fluctuations, frequency dependence of loads and seasonal variation in a feeder in line with the recommendations of the Zalte Committee report. It is desired that other regions may also account for such load dependency factors while deciding quantum of load under UFR scheme.
e) MS I/C, WRPC informed that during the 1st NPC meeting held at New Delhi NLDC clarified that 60% load envisaged in GSES scheme covers all the 10 contingency scenarios of which ADMS and UFR are integral part. The four stages of UFR which have 15%, 15%,30% & 30% respectively of load envisaged (60% of total demand). NRPC & WRPC observed that loads considered under AUFLS scheme are on higher side and identification of feeders for various contingencies under GSES would not be feasible. Therefore quantum under AULFS shall be 10%, 10%, 15% & 15% respectively in the four stages.

The group discussed this aspect in detail and suggested that a overall load relief in all the stages under AUFLS shall be in the range of 30%. Since the power number is around 3.5% of the load catered, a 40000MW system would have a power Number of approximately 1400MW and therefore the load relief of even 20% under the AUFLS considering the load diversity factor (for identified 30% ) is adequate to raise the frequency above 50Hz. Further for small States like Goa, DD and DNH it would be difficult to identify and implement 60% of the peak demand under this scheme and also for States like Chhattisgarh since it would translate in involving essential & Naxalite prone area loads under AUFLS where law and order problem could arise.

f) Regarding $df/dt$ as per existing scheme, WR sheds 6472 MW under $df/dt$ for three stages and the same are sufficient.

g) With this the WR plans to shed 11120 MW under AUFLS and $df/dt$. This is of the order of 28% of the demand catered by WR.

2) Agreeable points of GSES: Out of the system security concerns raised by GSES document, points (viii) and (ix) pertaining to AUFLS and $df/dt$ were recommended as above. Regarding point (x) Islanding, the group pointed out that islanding schemes at Mumbai, Uran, Ahmedabad , Watwa are existing in WR. Islanding loads cannot come under the general category and each island has to be planned accordingly. No more island scheme is under consideration in WR. Further a Task Force under Shri V. Ramakrishna Ex. Member (PS) CEA is discussing these aspects.

3) Other points of GSES: W.r.t. points pertaining to tripping of EHV loads for overdrawl, over injection/ Under Drawl, Under Voltage, line loading, power exceeding TTC, loss of generation in excess of 1000 MW and Angular separation. NLDC representative clarified that the above tripping of loads is different from ADMS which is a load management scheme. The members felt that the security threats apprehended by NLDC have to be explained in greater detail. Members informed that manual action, planned and distress load shedding by States is already under process. Further the contingency scenarios at points (i) to (vii) of the GSES document are of localized in nature and therefore the load mapping for these scenarios be done by WRLDC in consultation with State SLDCs, STUs and DISCOMs. The load mapping for contingency scenario at point (viii) shall be formulated by the study group of WR in consultation with the State SLDCs.

Further ADMS is getting envisaged to automate these tasks. There has to be clarity when the defence mechanism should operate and when manual/ automatic ADMS shall operate. Also the Hon’ble Commission CERC had queried CTU to differentiate between ADMS and GSES. After a clarification on the above is submitted by CTU, the above points may be taken up for discussion in the next meeting.
4) Implementation of ADMS: The relevant clause in IEGC is 5.4.2 (a) and (b). IEGC specifies to stop the overdrawl at 49.5 Hz and control of drawl when frequency touches 49.7 Hz. In this regard at present the guidelines are already being followed by SLDCs manually by way of planned, distress and emergency load shedding such that the operating frequency does not fall below 49.5 Hz under any case. However to implement the same automatically following difficulties were envisaged:

   a) Very Large Geographical area to be catered:
   b) Small load for each Distribution feeder
   c) Various priorities by different State Regulators for shedding load
   d) If EHV feeders are tripped as given in GSES document, then complete power supply to district would be cut off.
   e) Communication issues needs to be resolved as reliable communication is available in cities but not in remote areas.
   f) The overall scheme would become commercially very expensive.
   g) There is a need for clarity up to what percent of loads are under ADMS and how many would remain under manual/emergency actions.

The members discussed the above issues and it was decided that DISCOMs may begin the exercise of load mapping may for their respective States keeping in view their Regulator’s directives so that the IEGC clauses 5.4.2 (a) and (b) above are complied with and charting the communication requirements assuming that suitable source of funding may be made available. DISCOMs were requested to complete the exercise of load mapping within two months and the matter can then be discussed in the next meeting. MS I/C, WRPC requested DISCOM/SLDC to avoid overlapping of feeders identified for different purposes of GSES scheme while carrying out load mapping.

5) It was decided that the above recommendations would be informed to the WRPC in its next meeting.

6) It was decided that decision as regards to four stages of AULFS starting from 49.0 Hz, Df/dt scheme, quantum of loads considered under both plain & dt/dt under frequency scheme and identification of system security scenarios of GSES vis-à-vis load management scenarios would be forwarded to NPC for their consideration.

The meeting ended with thanks to the Chair and Group Members.
LIST OF PARTICIPANTS

Ist Meeting of Group to Implement GSES & ADMS, held on 22nd April 2013 at WRLDC (Mumbai).

**GETCO (Gujarat Energy Transmission Corporation Limited)**

1. Shri B.B. Mehta Chief Engineer, SLDC, GETCO
2. Shri U.G. Zalte Dir( Opn.), MSETCL, Bandra
3. Shri Sanjay T. Shinde CE, SLDC, Kalwa,
4. Shri Sanjay S. Kulkarni CE(STU), MSETCL, Bandra
5. Shri K.Sethumadhava Rao EE(STU), MSETCL, Bandra
6. Shri. S.S. Paratkar SE, MSEDCL, Kalwa
7. Shri S.S. Bongane EE(LM), MSEDCL, Kalwa

**MSETCL (Maharashtra State Electricity Transmission Company Limited)**

8. Shri P.A.R. Bende CE (SLDC), MPPTCL, Jabalpur.
10. Shri S.K. Bhagwatkar SE (DCC), MPPKVCL, Jabalpur.
11. Shri K.C. Mishra DGM(Opn.), MPPKVCL, Bhopal.
12. Shri Antim Jain EE (WLDC), MPPKVCL, Indore

**MSEDCL (Maharashtra State Distribution Company Limited)**

13. Shri K.S. Manothiya Chief Engineer (SLDC), Raipur
14. Shri M. Z. Rehman Superintending Engineer (T&C), Bilhai

**MPPTCL & MP DISCOM**

15. Shri Vivekanand Pandey Superintending Engineer (O &M), Raipur

**CSPTCL (Chattisgarh State Power Transmission Co. Ltd.)**

16. Shri S.K. Sharma AGM (Comml.), CC, New Delhi
17. Mrs. Shilpa Agarwal Mgr.(Comml), CC, New Delhi

**CSPDCL (Chattisgarh State Power Distribution Co. Ltd.)**

18. Shri Sunil Kumar Chief Mgr.(LD &C), PGCIL, Gurgaon
19. Shri Manoj Kumar Tripathi Chief Mgr.,(LD & C), PGCIL, Gurgaon

**PGCIL (Power Grid Corporation of India Limited)**

20. Shri J.J. Gandhi Dy CAO(R&C), Paschim Gujarat Vij Company Ltd.
21. Shri V.H. Thakar Dy Enggr (ALDC), Uttar Gujarat Vij Company Ltd.
22. Shri K.M. Dave CE, Madhya Gujarat Vij Company Ltd.
23. Shri K.N. Parikh SE, Madhya Gujarat Vij Company Ltd.

**Gujrat Vij Co. Ltd.**

25. Shri P. Pentayya GM, WRLDC, POSOCO, Mumbai
26. Shri V.K. Shrivismstava AGM, WRLDC, POSOCO, Mumbai
27. Shri S.R. Narasimhan DGM, SLDC, POSOCO, New Delhi

**RLDC, POSOCO**

28. Shri S.D. Taksande Member Secretary I/C
29. Shri Satyanarayan S. Superintending Engineer (O&S)
51. Shri M.M. Dhakate Superintending Engineer (Prot.)
30. Shri D. P. Singh Executive Engineer (Prot.)
31. Shri L.K.S Rathore Executive Engineer (Opn.)
32. Shri P. D. Lone Executive Engineer (Comml)
ITEM NO 4: IMPLEMENTATION OF DEMAND MANAGEMENT (IEGC 5.4), GRID SECURITY EXPERT SYSTEM AND DEMAND ESTIMATION:

Member Secretary I/c, WRPC informed that a petition was filed by PGCIL with the Hon'ble Commission CERC (Petition 265/MP/2012) seeking Commission’s approval for implementation of Grid Security Expert System by PGCIL in all the five regions. As stated in Items no 3 & 4 of the ROP dated 10\textsuperscript{th} January 2013 that the RPCs of all five regions would also take up the issue of “Implementation of Automatic Demand Management Scheme at SLDC/DISCOM level” (ADMS) and “Implementation of Grid Security Expert Systems” (GSES) as an agenda item within one month from the date of issue of this ROP and file their decisions within one week thereafter, after serving copies thereof on all the constituents of the respective RPC.

He informed that both the issues were discussed in the Protection Committee and Operation Co-ordination Committee levels. He also informed that the matter was under discussion in other RPCs as well. The brief description of the above and relevant IEGC clauses and other information is given in Annex 4.1.

The outcome of discussions was informed to the TCC. The TCC after discussion recommended the following:

1) The implementation of GSES and ADMS were agreeable in principle.
2) As the Automatic Demand Management Scheme is a subset/part of GSES and therefore it was recommended that the same will be implemented along with GSES.
3) Settings of frequency based defense mechanisms and quantum of load shedding etc., needs to be co-ordinated with other regions of the NEW Grid.
4) Manual load shedding, Automatic load shedding by demand management and load shedding under AUFLS and df/dt of GSES requires to be coordinated to avoid overlap and have clear distinction between manual actions and automatic control actions.
5) Logic, technology, communication facilities, funding and controlling agencies needs to be addressed.
6) Possibility of including WAMS data in the above schemes requires to be explored.

The TCC recommended that to discuss the above issue a group comprising of representatives of concerned utilities at appropriate levels shall require to be formed and the group may place its recommendations to the WRPC for its vetting and approval.

WRPC accepted the recommendations of TCC and Chairperson requested Member Secretary I/c to communicate to the Hon’ble Commission CERC the decision of WRPC and put up recommendations of group thus formulated to next WRPC meeting.