CENTRAL ELECTRICITY AUTHORITY
Grid Management Division

AGENDA FOR THE SECOND MEETING OF NATIONAL POWER COMMITTEE

Time & Date for the meeting: **1130 Hrs. on 16th July 2013 (Tuesday).**

Venue for the meeting: **2nd Floor, Conference Room, CEA, Sewa Bhawan, R.K. Puram, Sector-I, New Delhi.**

A. CONFIRMATION OF SUMMARY RECORD

Summary record of discussions of the 1st meeting of NPC held on 15th April 2013 at CEA, New Delhi was circulated vide CEA letter No. 8/X/MMS/GM-13 dated 07-05-2013 . No comments have been received on the summary record.

Members may, therefore, like to confirm the summary record of discussions.

B. FOLLOW-UP ACTION ON DECISIONS TAKEN EARLIER

B.1 IMPLEMENTATION OF MEASURES TO PREVENT GRID DISTURBANCE

B.1.1 Third Party Protection Audit

In accordance with the decision taken at the last meeting, all the States except J&K submitted the DPRs for R&U of protection system at their all substations of 220 kV & above (132 kV & above in case of NER States) as on 20th June 2013. Protection audit in M.P. (Western Region) was also completed within April 2013 as decided.

NRPC is requested to follow up with J&K respectively for immediate submission of DPR under reference.

B.1.2 Reactive Power Planning

It was decided at the last meeting that all STUs would submit to CEA the schemes required for Reactive Power management in their respective states in consultation with their respective RPCs by 30th June 2013. No such scheme was received by NPC secretariat from any State till preparation of this agenda.

RPCs are requested to intimate the progress in the matter.

B.1.3 **Ensuring proper functioning of Under Frequency Relays (UFRs) and df/dt relays**

As per decision taken at the previous meeting, RPCs had to ensure healthiness of UFRs and df/dt relays through regular inspection in a year of about one-third number of total relays installed in their respective region. RPCs had also to furnish the status of healthiness of UFRs and df/dt relays installed in the region to CEA on quarterly basis.

RPCs are requested to intimate the progress of inspection of UFRs and df/dt relays in their respective regions. They are also requested to send the status of healthiness of these relays for the quarter ending June 2013 to CEA by 15th July 2013.

B.1.4 **Islanding schemes**

It was decided at the last meeting that all RPCs would ensure completion of the process of designing / finalisation of the islanding schemes by the STUs of their region and submit the status & time-line of finalisation of scheme and implementation thereof by 30th April 2013. In case, no further islanding scheme was found feasible in a state, the same should be confirmed. A copy each of the reports of specific islanding schemes finalised / implemented would also be forwarded by the RPCs to CEA.

In Northern Region states Delhi, U.P., & Punjab have finalised their islanding schemes but status of implementation is to be furnished. Rajasthan and Haryana have yet to finalise their islanding schemes.

In Western Region, the islanding scheme is operational in Maharashtra and Gujarat.

In Southern Region, the islanding schemes have been finalised and are scheduled to be commissioned by August 2013.

In Eastern Region, West Bengal is yet to finalise the schemes (CESC Scheme already operational) while Jharkhand has yet to furnish the implementation schedule. In Bihar, the studies in progress.

In North-Eastern Region, Islanding schemes are under study.

Members may like to intimate the status.

B .2 : **Reporting the Status of implementation of the recommendations of the Enquiry committee:** All RPCs would update and forward the status of implementation of recommendations of the Enquiry Committee on Grid Disturbances of 30th & 31st July 2012 to CEA in the prescribed format on fortnightly basis regularly i.e. the status as on last day of a month to be forwarded by the 3rd day of the following month, and that as on 15th of the month to be forwarded by 17th of the month.

Fortnightly updates are being received only from SRPC. Other RPCs are also requested to send the same on regular basis.

B .3 **Review of Zone -3 Philosophy:** PGCIL informed that they had already reviewed and implemented revised Zone-3 settings for inter-state lines wherever required in the country in coordination with STUs and Generators. However, for the intra-state transmission lines, various data including existing Zone-III settings, had not been received by them, because of which they were unable to take similar action on such lines. All RPCs were requested to advise their STUs to furnish all such data to Director (Operation), PGCIL within three weeks for further necessary action by them.

RPCs and PGCIL are requested to intimate the progress.

B .4 **Ring fencing of Load Despatch Centres:** RPCs were requested to advise their states to furnish the status of separation of load despatching activity from other activities financially & administratively with a view to making their Load Despatch Centres independent & impartial. This information would be forwarded by RPCs to CEA before the next NPC meeting.

WRPC has informed that though there is some movement in this direction by some of the utilities as training programmes along with incentives are being arranged for State Load Despatchers. However, manpower shortage is coming in the way of promoting this policy. SRPC has informed that some of the states in the region are already carrying out separate SLDC accounting and the matter of ring-fencing of SLDCs is under discussion at state government level. Status in the matter from other RPCs is still awaited.

RPCs are requested to advise the states to augment the manpower to facilitate ring-fencing of SLDCs on priority and monitor the progress on regular basis.

NPC may like to discuss.

B.5 **Implementation of CEA Regulations:** RPCs were requested to examine the possible methods to check violations and ensure implementation of CEA regulations and forward their inputs to CEA before the next meeting of NPC for consideration.

No inputs have yet been received by CEA from RPCs. It is requested to expedite the same.

C. AGENDA ITEMS RECEIVED FROM RPCs

C1. Flat under frequency relay's based automatic load shedding scheme. In view of the improved operational grid frequency the stages of the UFR need to be raised. At the previous meeting of NPC, it was decided that the first stage of automatic load shedding through Under-Frequency Relays (UFRs) would be done at 49.2 Hz (against 48.8 Hz in NEW grid and 49.0 Hz in SR grid) at present in all the regions. Further, total number of stages for automatic shedding of load through UFRs - whether existing three or proposed four with a gap of 0.2 Hz between two consecutive stages - and the quantum of load to be shed at each level would be discussed by the RPCs internally with their constituents and revert back to NPC at the next meeting.

C1.1. Number of Stages for Automatic Under Frequency Relays based Load Shedding Scheme (AUFLS): SRPC based on the discussions with its constituents has communicated that they would like to have 3 stages of load shedding at 49.2, 49.0 & 48.8 Hz. WRPC has communicated 4 stages starting with 49.2 Hz. Regarding quantum of load to be shed at these stages, WRPC has suggested to determine first the total load to be shed in the NEW Grid, which could then be allocated to the four regions for implementation.

Other RPCs may also intimate their opinion in the matter to enable NPC decide the suitable number of stages for load shedding.

C.1.2. Methodology for quantum of load for AUFLS in different regions based on WRPC's Zhalte Committee Report: In the past the AUFLS schemes of WR were devised based on the region wise typical power number (MW/Hz) observed and co-related to the percentage of demand and was of the order of 3-3.5% of the demand catered. While this rule still gives similar results, a systematic way to anticipate the load relief as suggested in the report, is given below:-

i) The power number of NEW grid is approximately 3000MW

ii) It is proposed that with each full stage operation of AUFLS, the loads should be disconnected such that the frequency goes up by one Hz.

iii) Correction factor for Frequency Dependence (FD) of Loads: Loads are frequency dependent. The damping is assumed to be of the order of 1.5% (as experienced in past). That is a 1% change in frequency gives 1.5% reduction in Load MW (FD 1.5%) . So by the time the first stage operates, the frequency would be 49.2 Hz and loads would be lesser than their nominal value and so requires appropriate correction as explained below.

(FD = 1.5%)

Frequency (A)	Deviation from 50 Hz (B)	% Change in freq (C) = (B/50)*100	% Change in MW (D) =FD*C	Freq Factor correction (E) =100/(100-D)
49.2	0.8	1.6	2.4	1.025
49.0	1.0	2	3	1.031
48.8	1.2	2.4	3.6	1.037
48.6	1.4	2.8	4.2	1.044

iv) It is intended to give a load relief of 3000 MW for the frequency to improve by one Hz in the NEW Grid, but by the time the frequency touches 49.2 Hz, loads have reduced and by giving 3000*1.025 MW (corresponding to old frequency) we get the effect of 3000 MW.

v) Correction for Voltage Dependence of loads: Loads are voltage dependent too. In normal situation this may not be dominant but for larger disturbances this could also play a role in not giving enough load relief. While exact voltage dependencies are generally unknown, it is assumed that 50% loads are sensitive to voltage and 50% sensitive to (voltage)2 as a reasonably worst load. That is L new = L old (0.5* V + 0.5*V*V) = L old *0.85 assuming voltage falls to say 0.9 pu with system assumed to be integrated.

Thus the above loads are further corrected by a voltage factor of 1/0.85.

vi) Seasonal /Daily Load variation factor: Further the 'load' on feeder of 100 MW may give 'average load relief' of the order of 60-70MW due to daily and seasonal variations. To correct for the combined effects, a correction of (100/70) is added.

vii) Combining all the above factors, the net AUFLS plan for NEW Grid to raise the frequency by 1 Hz for each AUFLS stage operation is as given in table below :

Assumed power number (P) (MW/Hz)	Frequency (A)	Freq Factor correction (E) =100/(100-D) (ref prev. table)	Voltage Factor Correction (F) =(1/0.855)	Daily Load Fluctuation Factor (G) = (1/0.7)	Overall Correction factor (H) = E*F*G	NEW Required Load relief (I) = P*H (MW)
3000	49.2	1.025	1.17	1.43	1.71	5143
3000	49.0	1.031	1.17	1.43	1.72	5175
3000	48.8	1.037	1.17	1.43	1.74	5207
3000	48.6	1.044	1.17	1.43	1.75	5239

viii) The NEW Grid comprises of NR, ER, NER and WR regions. The above responsibility is to be shared by all in the ratio of their demands. As per recent data for NEW Grid demand of 93,000 MW, the ratio of demands of WR is 40%, NR is 42%, ER is 16% and NER is 2% approximately. So pro-rata distribution gives a revised AUFLS scheme as below:

Assumed power number (P) **(MW/Hz)**	Frequency (A)	WR	NR	ER	NER	NEW Required Load relief (I): refer table above **(MW)**
3000	49.2	2057	2160	823	103	5143
3000	49.0	2070	2173	828	103	5175
3000	48.8	2083	2187	833	104	5207
3000	48.6	2096	2201	838	105	5239

Southern Region's quantum of load shedding under AUFLS would also be worked out based on the above principle.

However, it is proposed that the frequency response characteristics of the grid (MW/Hz) be reviewed every year, which will also lead to change in the quantum of load to be shed in different regions.

NPC may like to discuss/approve the above.

C2. Methodology to bring agenda item in NPC by RPCs – providing adequate time to RPCs. (Agenda from SRPC) : Chairperson, SRPC has stated that since only the Chairperson RPC, Chairperson TCC & Member Secretary of the concerned region attends the NPC meeting, it is felt that adequate time be given to the other RPC members to consider the agenda items of the NPC. This is critical since as per clause 3 of the MoP order, decisions taken in the NPC shall be considered concurred by the respective RPCs for implementation.

It is proposed that in case some RPCs feel the necessity for discussing certain issues with their constituents before giving the opinion thereon, they could be allowed by NPC to do so. Such members could convene the regular / special meeting of TCC or RPC to discuss those issues and form their opinion before the next NPC meeting.

NPC may like to discuss.

C3. Inclusion of NTPC & Powergrid in NPC forum – (Agenda from SRPC) : Chairperson, SRPC has informed that CEA had been requested to consider inclusion of NTPC and POWERGRID in the NPC forum as recommended in the 20th SRPC meeting held on 28th September, 2012. In 22nd SRPC meeting held on 18th May, 2013, it has again recommended to include NTPC and POWERGRID in the NPC forum.

In this regard, it is to mention that CPSUs have representation in respective RPCs and efforts need to be made to resolve their issues first at the RPC level. If the issue remains unresolved in more than one RPC, then it may be referred to NPC for discussion at its meeting, wherein the CPSU like NTPC, POWERGRID, NHPC etc. can be invited as a special invitee, if required.

NPC may like to discuss.

C4. Holding of Protection Sub – Committee meetings at least twice a month. (Agenda from SRPC) Chairperson, SRPC has stated previously, before the directions of CEA, the Protection Sub-Committee meetings were held on a quarterly basis but after directions issued by CEA, they were being held on a monthly basis. As per new directions issued by CEA, these meetings should be held twice a month. Holding these meetings twice a month is a cumbersome task due to acute staff shortage in the utilities and limitation involved in the travel of the concerned officers. He has, therefore, requested that the meetings may be continued to be held on a monthly basis.

NPC may like to discuss.

C5. Shutdown of ISGS unit under RSD (Reserve Shutdown) during low regional demand - (Agenda from WRPC). Chairman, TCC, WRPC & Managing Director (GETCO) has stated that during rainy season, there is drop in demand even upto 30%, especially during the night. In such a scenario, it becomes extremely difficult for SLDC to curb under drawl. In order to avoid this scenario, SLDC generally submits their requests to RLDC for zero/less quantum of Central sector generation well in advance. However, RLDC schedules generation required for technical minimum capacity of Central Sector machines, thereby forcing SLDC to accept this and shutdown other cheaper sources of power. It has been suggested by him that one of the ISGS units may be stopped and other units may run on full load.

Similar situation of load reductions may occur after rains during harvesting periods in agrarian states like UP Rajasthan, Punjab etc.

NPC may discuss.

C6. Enhancing UI limits on State Periphery – (Agenda from WRPC). Presently, the over drawl / under drawl of electricity shall not be allowed beyond 12% of its scheduled drawl or 150 MW, whichever is less whenever the frequency is below 49.8 Hz and above 50.20 Hz.

However, with the coming up of bigger units of sizes (>=500MW capacity) and sudden reduction in generation may lead to over drawl of more than 150 MW. Further, with more players in short term open access and change in their injection / drawl schedule also directly affects drawl schedule at the inter state boundary. Many states have their demand of the order of 10000 MW or more and at least 3 to 5% variation in demand/generation may cause variation of 300 to 500 MW.

Chairman, TCC, WRPC & Managing Director (GETCO) has proposed to enhance the overdrawl limits by atleast 5% of the demand.

NPC may like to discuss.

C7. Utilization of Power System Development Fund (PSDF) – (Agenda from WRPC). Chairman, TCC, WRPC & Managing Director (GETCO) has stated that around Rs.1000 crore has been deposited in PSDF by WRLDC and they are not being utilised. Implementation of schemes like Grid Security Expert System (GSES), Automated Demand Management Scheme (ADMS), R&M scheme etc. can be effectively done through funding from PSDF**.** The proposal for using these funds and procedure for using this fund can be finalised**.**

NPC may like to discuss.

C8. Fund Requirement: Members may like to finalize the methodology for meeting the requirement of fund for establishment expenditure of NPC.

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