

**No.L-7/68(84)/2006-CERC**

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Coram:**

- 1. Shri Ashok Basu, Chairperson**
- 2. Shri K.N. Sinha, Member**
- 3. Shri Bhanu Bhushan, Member**
- 4. Shri A.H. Jung, Member**

**Re : Revision of Indian Electricity Grid Code - Statement of Reasons**

**Introductory**

Under directions of the Commission, Power Grid Corporation of India Ltd. (PGCIL), in its capacity as the Central Transmission Utility (the CTU), had submitted a draft of Indian Electricity Grid Code (the IEGC) in April 1999. After detailed deliberations, the Commission had approved the IEGC and it was issued in January 2000. The IEGC was subsequently revised, the revised version having been approved by the Commission vide order dated 22.2.2002. The revised IEGC became effective from 1.4.2002 and still continues to be in force.

2. Meanwhile, the Electricity Act 2003, (the Act) came into force from 10.6.2003. One of the functions assigned to the Commission under sub-section (1) of Section 79 the Act of is to specify Grid Code having regard to Grid Standards. Thus, the IEGC is to be specified by the Commission by taking into account the Grid Standards specified by the Central Electricity Authority (CEA). The Grid Standards for maintenance and operation of the transmission lines are yet to be specified by CEA. Considering the importance of the IEGC in inter-state transmission of electricity, and that the matter did not brook any delay, the Commission decided to specify the IEGC pending

finalization of the Grid Standards by CEA. The IEGC may need to be reviewed as and when the Grid Standards are specified by CEA.

3. The draft of the IEGC with the following salient features was published by the Commission on 15.6.2005, namely:

- (a) Addition of a new chapter on inter-regional energy exchanges, with a view to provide for enhanced the grid security measures and energy balancing among the five electrical regions in the country;
- (b) Time-table for implementation of Free Governor Mode of Operation (FGMO) of the generating units;
- (c) Levy of reactive energy charges on power flow on all inter-state transmission lines; and
- (d) State Load Despatch Centres (SLDCs) were proposed to be assigned more responsibilities, which includes supervising the operation of all entities within a State and act as a nodal agency for coordination with RLDC.

4. The comments on the draft IEGC have been received from the utilities/organizations listed in Appendix `A' to this statement.

5. The suggestions made by the stakeholders have been considered. The IEGC has been finalized and is already posted on the Commission's web-site in December 2005. The IEGC is to be implemented with effect from 1.4.2006. We discuss the suggestions made and the Commission's decisions thereon in the succeeding paras.

## **Chapter-1 : GENERAL**

6. In the draft IEGC it was proposed that Damodar Valley Corporation (DVC) would be treated like the State Transmission Utility/Electricity Board as DVC is an integrated utility with its own generation, transmission and distribution network within its command area. Jharkhand SERC has suggested a modification of the provision, stating that no such status is conferred on DVC under the Act. It is clarified that DVC has been compared with STU/SEB for very limited purpose and to the extent that its peripheral scheduling is done by RLDC like a SEB/STU and not for any other purpose.

7. It was proposed that for the purpose of the IEGC, the generating stations belonging to Bhakhra Beas Management Board (BBMB) and Sardar Sarovar Narmada Nigam Ltd. (SSNNL) would be treated as intra-state generating stations, but their transmission system was to be considered as inter-state transmission system. It has been pointed out by some of the beneficiaries that BBMB and SSNNL generating stations could not be treated as intra-state generating stations as they supply power to more than one State. The proposal has been retained since BBMB is jointly owned and operated by the partner States and no sale of electricity to any outside entity takes place. Therefore, it is treated as intra-state generating station for the purpose of the IEGC.

8. In para 1.5 of the draft IEGC the procedure for dealing with instances of persistent non-compliance of the provisions of the IEGC was incorporated. It was proposed that in the first instance, the instances of persistent non-compliance should be reported to Member-Secretary, Regional Power Committee (RPC). PGCIL has suggested that instances of persistent non-compliance should be reported to the

“Dispute Resolution Forum” comprising member of RPC, RLDC and NLDC to be constituted by RPC instead of RPC. The suggestion made requires detailed deliberations. For the present, we have retained the proposal made in the draft IEGC, which is also in conformity with the arrangement in the IEGC revised during 2002.

9. In para 1.6 of the draft IEGC, the time-table on implementation of FGMO was proposed. All thermal generating units of installed capacity 200 MW and above and reservoir based hydro units of installed capacity 50 MW and above in Southern, Eastern, Northern and Western Regions were proposed to be brought under FGMO with effect from 1.10.2005, all thermal and reservoir based hydro generating units of installed capacity 10 MW and above in North Eastern Region with effect from 1.10.2005. All other thermal and hydro generating units were proposed for FGMO implementation with effect from 1.4.2006.

10. It has been opined by the stakeholders that no prospective cut-off dates for implementation of FGMO need be mentioned as cut-off dates were already specified in the existing IEGC and petitions filed to seek exemption from FGMO operation. PGCIL has suggested self-certification by all the generating stations on monthly basis to RLDCs and SLDCs. SREB has commented that fresh dates for implementation of FGMO may give an impression of relaxation of the stipulations already made in this regard. NTPC has stated that FGMO should be implemented after 3 months from the date of issuance of modified scheme for all coal based generating units of capacity of 200 MW and above and for all other coal based generating units it should commence after one year from the date of issuance of modified scheme.

11. An expert team has been constituted in CEA to study and recommend suitable measures to obviate the difficulties being faced by the utilities in operating FGMO. Suitable control models have been developed. The team is visiting the power stations in the country and testing different control models for FGMO implementation. Therefore, the time-table for implementation of FGMO in the country will be announced separately on finalization of studies.

12. On para 1.7 of the draft IEGC, regarding pricing of reactive energy, NHPC has suggested that instead of giving escalation in % terms, the escalation might be given in paise/KVARh to avoid any discrepancy in rounding off. This suggestion has been accepted and modification in terms of escalation of VAR charges by 0.25 paise/KVARh has been made in the IEGC.

13. Para 1.9 of the draft IEGC contained glossary and definitions of the terms used in the main body. The utilities have suggested changes in some of the definitions. It is not possible to deal with each of these suggestions in this statement. However, on examination, suitable modifications have been made in the IEGC, wherever considered necessary so as to make the intent clear and explicit.

## **Chapter-2 : ROLE OF VARIOUS ORGANISATIONS AND THEIR LINKAGES**

14. Chapter 2 of the draft IEGC defined the role and responsibilities of different agencies involved in the electricity sector. PGCIL has suggested that roles and responsibilities of NLDC, RLDC, SLDC, CTU, RPC, CEA, Transmission Licensees and Traders as given in the Act and other notifications could be retained. The roles of

all the aforesaid agencies except transmission licensees and traders have been incorporated in the IEGC for the purpose of grid operation only.

15. Para 2.3.2 defined the functions of the RPCs. Most of the stakeholders have suggested that the functions of RPCs should be in line with Ministry of Power resolution dated 25.5.2005. The suggestions have been accepted and suitable modifications have been made in the IEGC.

16. Para 2.3.3 of the draft IEGC provided that Regional Energy Accounts (REA) and weekly statements of UI charges and VAR charges would continue to be prepared by the concerned REB/RPC Secretariat, for the present.

17. Many of the stakeholders opined that work of Regional Energy Accounting (REA) should remain with RPCs. CEA has stated that clause (c) of sub-section (3) of Section 28 of the Act cannot be construed so as to include preparation of Regional Energy Account (REA) by RLDC. The basic contention of CEA is that RLDCs should continue with collection of SEM data, its processing and compilation to arrive at active power, reactive power as per the Act. However, preparation of REA based on inputs to be made available by RLDCs and final checking should remain with RPCs as at present.

18. This issue has been examined in great detail. Sub-section (55) of Section 2 of the Act, envisages establishment of Regional Power Committees through the resolution of the Central Government. Ministry of Power vide its resolution dated 25.5.2005 has constituted RPCs, thereby replacing the Regional Electricity Boards.

The Ministry's resolution does not assign the work of preparation of REA to the RPCs though it assigns some other functions to them. The Ministry has issued amendments to the original resolution dated 25.5.2005 through a further resolution dated 29.11.2005, which is also silent on the question preparation of REA by the RPCs.

19. Keeping in view of the fact that Ministry of Power has chosen not to allocate "REA work" to RPCs, the Commission has modified the relevant provision of the draft IEGC to align it with the Act, and accordingly, the responsibility of preparation of Regional Energy Accounts, hitherto with the REB Secretariats will stand transferred to the RLDCs with effect from 1.4.2006. Suitable modifications in the relevant paras have been carried out. Also, para 2.3.3 of the draft IEGC has been replaced with following new provision:

*"Decision of RPC arrived at by consensus regarding operation of the regional grid and scheduling and despatch of electricity will be followed by RLDC subject to direction of Central Commission, if any."*

20. Paras 2.5 and 2.6 of the draft deal with the functions of CEA and SLDCs. Jharkhand SERC has opined that functions of CEA and SLDCs should be modified so as to be at par with those defined under the Act. In this regard it is stated that the IEGC has listed out those functions which are relevant to the grid operation. Therefore, amendments to these paras are not considered necessary.

21. PGCIL has suggested addition of a new para 2.6.4 after para 2.6.3 of the draft, as under:

*“(1) In order to ensure clear chain of accountability, the following is proposed:  
(1) The RLDC shall interact and coordinate only with the SLDCs (and the STUs if necessary) on all matters concerning a State, and with no other intra-State entity.*

*(2) The SLDCs shall be responsible for all related coordination with the intra-State entities, and interacting on their behalf with the RLDC.*

*(3) Each State as a whole shall be treated as an entity in the regional grid, and as one entity for the purpose of allocations / shares in Inter-State Generating Station (ISGS), for daily scheduling and despatch, for accounting of unscheduled interchange (UI) and reactive energy.*

*(4) The bifurcation of the State’s total entitlement in ISGS availability for the day, advising the intra-State entities about their respective entitlements, and collecting their requisitions, compiling them into State’s total requisition from ISGS, etc shall be carried out by the SLDC.*

*(5) The STU/SLDC shall be responsible for installation of special energy meters on the interconnecting points of all intra-State entities who need to have such meters, for organizing the periodic collection of meter readings for preparation of intra-State energy accounts and issuing the UI statements of all concerned entities (at least once a week).”*

22. The above suggestions of PGCIL considered relevant to the IEGC are covered in Chapter 6 under the title “Scheduling and Despatch Code”. The other suggestions are of more relevance to the State Electricity Grid Codes, for which the background note appended to the IEGC provides the necessary guidance.

### **Chapter – 3: PLANNING CODE FOR INTER-STATE TRANSMISSION**

23. Para 3.4 of the draft deals with the planning policy. Jharkhand SERC has suggested to add “electricity plan of the States prepared by STUs” at para 3.4 (b) (v). The perspective transmission plan published by CEA covers both, the inter-state as well as intra-state transmission system. The suggestion of Jharkhand SERC already stands taken care of in para 3.4 (b) (i). The addition suggested by Jharkhand SERC is, therefore, not relevant.



24. In para 3.4(a) under the heading “*Planning Policy*” of the draft IEGC it was provided that the perspective transmission plans prepared by CEA should be continuously updated. WBSEB has suggested to provide that CEA would formulate perspective transmission plans after active interaction with respective SEB/STU. As has been mentioned in para 3.4(c), the transmission plans are finalised in the Regional Standing Committees of CEA in consultation with the beneficiaries, and involves active interaction with respective SEB/STU during formulation of perspective transmission plan. Accordingly, no modification on the lines suggested by WBSEB is called for.

25. The suggestion made by PGCIL for the representation of RLDCs in the Regional Standing Committees has been considered and a suitable modification has been made in para 3.4(c) and incorporated in IEGC because as a real time operator, RLDC needs to be involved in finalization of transmission plans.

26. PGCIL has suggested adding the following New Clause between 3.4(j) and 3.4(k).

*“A generating company or a person setting up a captive generating plant and establishing operating and maintaining a dedicated transmission line inter-connecting to ISTS shall have to apply for long term open access as per the terms and conditions notified by CERC.”*

27. The treatment of open access is already dealt with in para 3.4(d) & (e) to some extent. Since the terms and conditions on open access notified by the Commission are binding and have to be followed, the suggestion of PGCIL has not been included in the IEGC.

28. Jharkhand SERC has suggested addition of the following in para 3.5.

*(a) system should provide for optimum utilization of assets/facilities*

*(b) transmission losses should be within prescribed limits*

29. The suggestion of Jharkhand SERC are linked to transmission planning. The transmission planning criterion is based on guidelines given by CEA. Therefore, these points have not been considered.

30. WBSEB has suggested that transient stability constraints like outage of largest generating unit, a single line to ground fault on 400 kV line, and a permanent three phase fault might be included in para 3.5(a) which details the general policy for the planning criterion. Similarly, PGCIL has suggested adding the following at the end of the Para 3.5(a).

*"Many 400 kV and 220 kV lines will have series compensation in future. It is therefore necessary that the planning criteria must include outage of a 220 kV D/C series compensated or a 400 kV S/C series compensated line. This might either be included in the planning criteria of CEA or specified by the Commission in this clause."*

31. The Commission feels that each and every constraint cannot be included in the IEGC.

32. CEA suggested to add a new section on "Planning Process and Development" between sections 3.4 and 3.5. The write up furnished by CEA in support of its suggestion was examined and the modifications wherever considered necessary have been carried out. A separate section has not been introduced because generally the

views of CEA's are reflected in existing para 3.5 and their incorporation in the IEGC could be a mere repetition.

33. PGCIL suggested addition of the following:

*“System Protection Schemes (SPS) must be envisaged at the planning stage jointly by CEA, CTU and generating stations and the same to be implemented to take care of reliability of the system in the event of large contingencies such as outage of HVDC Bipole / outage of an entire power station causing bulk power loss. Wherever adequate transmission system is not planned / executed to take care of the contingencies due to tripping of HVDC Bipole, 765 kV lines etc, inter trip schemes for generating stations / reduction in generation may be planned for the security of the grid. All agencies should be responsible for security of the grid and availability of the system.”*

34. The issues like those raised by PGCIL can be discussed in the meetings of Regional Standing Committees where beneficiaries are also represented and therefore these are not incorporated in the IEGC.

35. NTPC has suggested adding “which would not include reactive power capability of the generators” at the end of para 3.5(e). The reactive power capability cannot be ignored. The Commission is of the opinion that no stipulation to that effect is necessary, and it is to be left to the generator to contribute in reactive power management based on technical capability of its machines.

#### **Chapter-4 : CONNECTION CONDITIONS**

36. This Chapter specifies the minimum technical and design criteria to be complied with by the CTU and any other agency connected or seeking connection to ISTS. CEA has stated that once the regulations on Grid Connectivity are notified,

Chapter 4 would become redundant. NTPC has suggested to add the following sentence at the end of-

*“In case of any difference with regard to Connectivity Standards and Grid Standards between this Code and those published by the Central Electricity Authority, the provisions of the latter shall prevail”.*

37. In the opening part of this statement it is already stated that once the Grid Standards are notified by CEA, the IEGC would be reviewed and modified if necessary. Therefore, for the present we have retained connection conditions in Chapter 4 of the IEGC.

38. PGCIL has suggested addition of “data communication including the RTU etc.” in para 4.5 (iii) of the draft “and telemetry” in para 4.5 (v). The suggestion of PGCIL has been accepted because after implementation of ULDC scheme, data communication including RTU, and telemetry play an important role. The IEGC has been finalized keeping in view these suggestions.

39. PGCIL has also suggested adding the following new clauses 4.6(d) & (e).

*“(d) Voltage waveform quality – The user(s) of ISTS shall ensure to limit the harmonic injection into ISTS network as specified in the (Grid Connectivity) Standards framed by the Authority.*

*(e) Flicker - The user(s) of ISTS shall ensure to limit the flicker severity as specified in the (Grid Connectivity) Standards framed by the Authority.”*

40. The Commission is of the view that too much refinement is not needed at this stage and incorporation of the suggestions can be considered at a later stage, if found necessary.

41. PGCIL has further suggested to modify para 4.6 of the draft as under:

*“Protection systems are required to be provided by all agencies and Constituents connected to the ISTS in coordination with CTU. In case of installation of any device which necessitates modification/ replacement of existing protection relays/ scheme in the network, such modification/ replacement shall be carried out by owner of respective part of network”*

42. PGCIL has recommended that the following could be added at the end of para 4.6:

*“The RPCs would also identify critical locations where bus bar protection needs to be provided, if not available.”*

43. The Commission has agreed with the above suggestions of PGCIL because a network user has to take care of any modification need arising on account of installation of any device in his command area. It is learnt that bus bar protection at many of the critical locations is not in existence so its identification is required. In the IEGC these suggestions of PGCIL have been taken care of.

44. PGCIL has suggested to modify para 4.10 with the following:

***“Data and Communication Facilities***

*Reliable and efficient speech and data communication systems shall be provided to facilitate necessary communication and data exchange, and supervision/control of the grid by the RLDC, under normal and abnormal conditions. All agencies shall provide Systems to telemeter power system parameter such as flow, voltage and status of switches/ transformer taps etc. in line with interface requirements and other guideline made available to RLDC / SLDC. The associated communication system to facilitate data flow up to RLDC/SLDC, as the case may be, shall also be established by the concerned agency as specified by CTU in connection agreement. All agencies in coordination with CTU shall provide the required facilities at their respective ends and RLDC / SLDC as specified in the connection agreement.”*

45. PGCIL has also suggested to add a new para 4.12 (a) (iii):

*“All agencies connected to or planning to connect to ISTS would ensure providing of RTU and other communication equipment, as specified by RLDC/SLDC, for sending real-time data to SLDC/RLDC at least before date of commercial operation of the generating stations or sub-station/line being connected to ISTS”.*

46. Both the suggestions of PGCIL as at paras 44 and 45 above have been accepted in view of importance of data communication and telemetry in the real time grid operations, and incorporated in the IEGC.

#### **Chapter-5 : OPERATING CODE FOR REGIONAL GRIDS**

47. TERI has suggested that grid frequency should be as close as possible to 50 Hz and not in the band of 49-50.5 Hz. NTPC has suggested modification of para 5.2 (l) as *“RLDC, with the help of all Regional constituents shall make all possible efforts to maintain the grid at rated system frequency of 50 Hz as per clause 4.6 (d).”*

48. The existing ABT mechanism is linked with frequency band of 49-50.5 Hz and, therefore, frequency band has been specified. Further, NTPC’s suggestion gives an indication that maintenance of normal frequency is the responsibility of RLDC. This is not so. It is the collective responsibility of all the regional constituents. Therefore, the suggestions for amendment have not been agreed to.

49. PGCIL has suggested that following additional clause may be incorporated at the end of para 5.2 (n):

*“All inter-tripping and runback mechanisms should be in service. In case the same has been kept out of service due to contingencies, RLDC may be immediately informed of the same and restored after the contingency is over.”*

50. The Commission has agreed to incorporate the suggestion as inter-tripping and run back arrangements are integral parts of system protection scheme.

51. PGCIL has further suggested to add the following at the end of para 5.3 (1) (c) concerning demand estimation:

*"& weather forecast data available to it from time to time".*

52. This suggestion of PGCIL has also been accepted because weather forecast plays an important role in demand estimation.

53. The following suggestion of PGCIL for incorporation in para 5.4 (2) (a) has not been accepted as the Commission feels that this matter should be left to be decided by the STU:

*"The requisite load-shedding shall be carried out in the concerned state to curtail drawal so that the frequency does not fall below 49.0 Hz. However, manual load shedding should not be carried out on the feeders on which UFRs are provided."*

54. NHPC has suggested to amend para 5.8 (b) as under:

*"Hydro generating stations may have mock trials by starting each unit separately one by one using DG power at least once in six months, during routine start up operation of the station".*

55. The suggestion of NHPC has already been taken care of in the existing para and hence no changes have been made.

56. Para 5.9.5 of the draft IEGC referred to the reportable events. Jharkhand ERC has suggested to add (a) Synchronization of new generating plant, (b) Non-

compliance of RPC decision, and (c) Reflection of regional disturbance causing instability in State Grid in this para. PSEB has suggested to add (a) Mal-operation of protection, and (b) Failure of any element in ISTS. WBSEB has suggested addition of (a) Exceptionally high/low system voltage or frequency, and (b) Serious equipment problem.

57. The additions suggested by the stakeholders are already covered in the relevant para in general terms and, therefore, no modification has been made.

#### **Chapter – 6 : SCHEDULING & DESPATCH CODE**

58. Para 6.4.8 of the draft IEGC proposed that when frequency was higher than 50.5 hz., the actual net injection should not exceed the scheduled despatch for that “hour”, NHPC has suggested that the word “hour” may be replaced with “15 minutes”. This suggestion has been considered and the word “hour” has been replaced with word “time”, to correctly reflect the intent.

59. On para 6.4.9 of the draft IEGC, PGCIL suggested that third sentence onwards may be modified as below:

*“In case the situation does not call for very urgent action, RLDC may analyze and take appropriate action by curtailing first the overdrawing entity causing constraint, followed by curtailment of the short term transaction followed by the long term transactions.”*

60. The suggestion of PGCIL has been considered to the extent that the last sentence has been modified by inserting “in the above sequence” after the word “first”.



61. Para 6.4.14 of the draft IEGC dealt with installation of special energy meters and other related issues. CEA has suggested that this para should be qualified by the expression that the provisions should be as per regulations on installation of meters prepared by CEA.

62. CEA's regulations are to cover both inter-state and intra-state meters and, therefore, these regulations are expected to be general in nature, while the Commission's stipulation on meters are very specific. Therefore, the stipulations in the IEGC on meters are not likely to conflict with CEA's regulations, which have to be specified separately. Therefore, the suggestion made by CEA has not been incorporated in the IEGC.

63. In response to para 6.4.13, Rajasthan ERC has suggested modification of the para by adding that if RLDC is not satisfied with the back up data RLDC may disallow over/under declaration of plant capability and modify the schedules retrospectively. This suggestion of Rajasthan ERC is already covered under para 6.4.16.

64. PGCIL has suggested the following additional provisions under para 6.4.14 of the draft IEGC:

- (a) Constituents to provide full cooperation to CTU for installation, testing and commissioning of Special Energy Meter in their premises.*
- (b) SLDCs would act as the co-coordinating agency for substation/power station under their control in all matters related to SEM data (forming part of regional UI account) downloading and its transmittal to the RLDC on weekly basis, ensuring resolution of problems related to CT/CVT inputs to the meter and correction of time drift.*
- (c) SLDCs to ensure SEM data availability to RLDCs by Tuesday for the previous week.*

*(d) In case of persistent non-receipt of SEM data by RLDC, matter shall be taken up with the concerned SLDC.*

*(e) Cost of special energy meters, DCDs, meter testing equipments and other accessories shall be shared by the regional constituents.*

65. The issue regarding co-operation by the constituents for installation of SEMs in their premises is already covered. The second point raises the issue in connection with intra-state ABT mechanism which is beyond the scope of this Commission's powers. The other points are to be taken care of by the CTU. As such, no specific provision was needed in the IEGC at this stage.

66. Para 6.5 of the draft lays down the scheduling and dispatch procedure and in that context the term "Inter-State Generating Stations (ISGS)" has been used. NREB has sought clarification on the term ISGS. It has been illustrated that Delhi, Punjab, Uttar Pradesh and U.P in Northern Region have got some power stations in which Haryana and H.P also have shares. Malana HEP, an IPP in H.P, supplies power to Haryana in addition to the home state H.P. itself. It has been pointed out that these generating stations qualify to be treated as ISGS and, therefore, be scheduled by RLDC. The point made has been considered. An additional para 6.4.17 has been incorporated in the IEGC to take care of the type of cases referred to by NREB.

67. In the context of para 6.5.2 of the draft IEGC, TNEB has suggested to add a new clause to the effect that RLDC should be responsible for calculating the estimated transmission losses and for the periodic review thereof. This aspect is already covered in para 3 of Annexure-I and as such no further provision was required to be made.

68. In response to para 6.5.7 of the draft IEGC, PGCIL has suggested the following for consideration:

*“The ramping rate should generally be in percentage of station capacity, in accordance with Para 6.2 (h) of IEGC. Further, in decentralized scheduling and dispatch mechanism, RLDCs may not be in a position to ensure the desired ratio of minimum and maximum injection schedule of ISGS, hence technical minimum shall be agreed by beneficiary with ISGS. The station ramping rate depends upon the no. of units, capacity of units, type of fuel etc and may change on daily basis depending upon the no. of unit in service. Hence, ramping rate may be as per declaration of ISGS, based on which RLDCs will finalize the ramping rate for ISGS & constituents for the day. The ramping rate has to be given daily by ISGS to RLDC and by SGS, IPP etc. to SLDC. Similarly, the ramp-up / ramp-down rates for the bilateral exchanges are also to be provided to RLDCs.”*

69. The Commission’s stipulation in para 6.5.7 of the draft IEGC is general and is for the purpose of grid code whereas PGCIL’s above suggestion is specific. So no modification has been done based on the suggestion made.

70 Para 6.5.17 of the draft IEGC proposed that in order to discourage frivolous revisions, RLDC could in its sole discretion, refuse to accept schedule/capability changes of less than 50 MW (10 MW in NER). NHPC has suggested a modification that instead of laying the limit in terms of MW of electricity, the changes could be in percentage terms. It suggested replacement of the provision by “To discourage .... Capability changes of *less than 5% of the previous DC incase of pondage or storage type ROR schemes and changes of less than 1% of previous DC in case of purely ROR schemes of Hydro*”. The above suggestion of NHPC has been examined and found to be acceptable. Accordingly a modification has been done in the IEGC.

71. On para 6.5.6 of the draft IEGC, NREB has suggested that dispatch schedules and net drawal schedule in MW be specified with resolution of at least 0.01 MW. This

aspect has been considered by the Commission. A new para 6.5.21 has been added to address the suggestion of NREB.

72. While commenting upon the provisions made in para 6.6.6 of the draft IEGC, NREB has requested to evolve methodology for transmission of VAr generation at the cost of active power under low voltage conditions by an ISGS. NREB has sought to substantiate its suggestion by example of Uri HEP of NHPC in the State of J&K. The view canvassed by NREB is already taken care of in para 12 of the background note, which is again reproduced hereinbelow:

*“The intra-State scheme for pricing of reactive energy exchanges between the intra-State entities has to be very carefully deliberated upon by the concerned SERC/STU, and duly covered in the State Electricity Grid Code. The requirements of local reactive support may differ from State to State and the approach may differ from that in this IEGC. For example, the inter-State generating stations (ISGS) have to generate/absorb reactive power as per instructions of RLDC, “without sacrificing on the active generation required at that time”, and “no payment shall be made to the generating companies for such VAr generation/absorption”. This is because (1) the ISGS are mostly located away from load-centres, (2) they generally have a lower variable cost, and (3) they are paid a capacity charge covering the cost of entire installation, including their reactive power capability. The situation of intra-State stations may differ in these respects, and a different approach to their reactive energy output may be necessary.”*

## **Chapter-7 : INTER REGIONAL EXCHANGES**

73. PGCIL has suggested to replace “Kolar” in the last line of para 7.4.3. of the draft IEGC with “Talcher”. PGCIL’s suggestion has been considered and suitable corrections have been made in para 7.4.3, as also other paras, namely, paras 7.4.5, 7.4.7 and 7.5.2.

74. WREB, on para 7.4.8 has suggested to include CEA along with ERLDC, SRLDC, NTPC and PGCIL for jointly working out and implementing the required inter-tripping / run back arrangements between Talcher – II STPS and Talcher-Kolar HVDC link. This suggestion has been accepted and para 7.4.8 has been suitably modified.

75. Para 7.6.1 of the draft IEGC lists the interfaces for scheduling and UI accounts at regional boundaries. One of the interface points between WR & SR has been shown as 400 kV West bus of Chandrapur HVDC. PGCIL has suggested to replace West bus with South bus, since 400 kV Chandrapur-Ramagundam line is connected to the South bus of Chandrapur HVDC. So interface point should be South bus as already approved by SR/WR Boards and presently in vogue. EREB has suggested that status quo for ER-NER scheduling and metering be maintained. Para 7.6.2 lays down the process for payments for inter-regional UI exchanges. NREB, SREB, WREB have suggested that existing practice should continue, otherwise dependence on data from ER/WR may delay in issuing weekly accounts.

76. The above suggestions have been examined. The provisions made in the draft IEGC are in line with the details being specified separately in due course, and as such do not require any changes.

#### **Annexure – I : COMPLEMENTARY COMMERCIAL MECHANISMS**

77. NTPC has suggested modification of clause so as to incorporate that the beneficiaries shall pay to the respective ISGS capacity charges corresponding to plant availability and energy charges for the scheduled dispatch (and Incentives, if any, for generation above target PLF).

78. The clarifications on these points already exist in the relevant notifications and orders of the Commission. So the Commission feels that it is not necessary to reproduce them in the IEGC.

79. Para 8, which makes provisions for utilization of money remaining in the Regional Energy Account on training of SLDC employees, NREB and EREB have suggested that the money should be utilized for shunt capacitors to overcome low voltage problem persisting in the grid.

80. The intent of the VAR charges scheme is to induce the beneficiaries to install capacitors. The money remaining in the Regional Energy Account should, therefore, not be used for capacitor installation, but for other beneficial purposes, as proposed in the draft IEGC. The provision has accordingly been retained in the IEGC.

81. The Commission has added one para, para 11 to smoothen the accounting procedure. Certain other changes incidental to transfer of work of REA from RPC to RLDC have also been made in the IEGC.

## **Annexure – II : REGULATORY REQUIREMENTS OF SPECIAL ENERGY METERS**

82. NTPC has suggested the following:

- (a) **Requirement of meters:** It has been proposed that the second sentence in Clause (1) of the Annexure may be replaced with “Each interconnection shall have one (1) Main meter and one (1) Check meter connected to same CT and PT circuits and also that in the third

sentence the word “*Standby/Check*” shall be replaced by “Standby meters”.

- (b) **Energy Computation in Case of Meter failure:** A new clause providing that in case of problem in Main meter reading, corresponding Check meter reading for the duration of failure shall be considered for energy computation. In case of failure of any pair of Main & Check meters, energy would be computed based on the readings of standby meters for the duration of failure, has been suggested to be introduced.
- (c) **Time synchronization of Special Energy Meters :** The suggestion has been made for addition of the sentence “The meters shall be time synchronized once every six months or when drifts reported are of more than one minute”, at the end of clause 9.
- (d) **Maintenance of Special Energy Meters :** Similarly, in the opinion of NTPC it needs to be added at the end of clause 10 that the CTU shall be responsible for the maintenance / replacement of defective meters.
- (e) **Checking/ Calibration of Special Energy Meters :** The suggestion made by NTPC is to the effect that RLDC should check the computed energy from Main and Check meters (time block wise) on a regular basis. In case, the difference is observed to be more than 0.4%, RLDC should ask the CTU to investigate and check each meter against 0.2

class standards and replace the faulty meter, and for insertion of a suitable clause to replace clause 12.

83. The above suggestions of NTPC have been examined. It is found that most of the suggestions are already taken care of in the Annexure attached to the draft IEGC. Also, only the minimum regulatory requirements have been specified in the Annexure, and detailed specifications and procedures are to be finalized by the CTU.

### **Conclusion**

84. The necessary steps should be taken by all concerned for implementation of the revised IEGC from 1.4.2006, as already decided.

**Sd/-  
(A.H. JUNG)  
MEMBER**

**Sd/-  
(BHANU BHUSHAN)  
MEMBER**

**Sd/-  
(K.N. SINHA)  
MEMBER**

**Sd/-  
(ASHOK BASU)  
CHAIRPERSON**

**New Delhi dated the 17<sup>th</sup> February 2006**



**Appendix `A`  
(Refers to para 4 of the Statement of Reasons)**

- i) Power Grid Corporation of India Ltd. (PGCIL)
- ii) National Thermal Power Corporation Ltd. (NTPC)
- iii) National Hydroelectric Power Corporation Ltd. (NHPC)
- iv) Neyveli Lignite Corporation Ltd. (NLC)
- v) Northern Regional Electricity Board (NREB)
- vi) Eastern Regional Electricity Board (EREB)
- vii) Western Regional Electricity Board (WREB)
- viii) PTC India Ltd. (PTC)
- ix) Tamil Nadu Electricity Board (TNEB)
- x) Punjab State Electricity Board (PSEB)
- xi) Energy Department, Government of Jharkhand
- xii) Jharkhand Electricity Regulatory Commission, (Jharkhand ERC)
- xiii) Tata Power Trading Company Ltd. (TPTCL)
- xiv) Tata Energy Research Institute (TERI)
- xv) Lanco Electric Utility Ltd. (Lanco)
- xvi) Central Electricity Authority (CEA)
- xvii) West Bengal State Electricity Board (WBSEB)
- xviii) Centre for Competition Investment and Regulation (CUTS)
- xix) Rajasthan Electricity Regulatory Commission (Rajasthan ERC)
- xx) Rajasthan Rajya Vidyut Prasaran Nigam Ltd. (RRVPL)
- xxi) Maharashtra State Distribution Company Ltd, (MSDCL)
- xxii) Southern Regional Electricity Board (SREB)