

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 157/MP/2013

Subject : Petition under Regulation 22 (3) of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 for revision of Declared Capacity for a day (in MW) for the generating stations of the THDC India Limited.

Date of hearing : 9.9.2014

Coram : Shri Gireesh B. Pradhan, Chairperson
Shri A.K. Singhal, Member
Shri A.S. Bakshi, Member

Petitioner : THDC India Limited

Respondent : Northern Regional Load Despatch Centre

Parties present : Ms. Anushre Bandhari, Advocate, THDC Limited
Shri Santosh Majid Siddiqi, THDC Limited
Shri J.K. Hatwal, THDC Limited
Shri Padamjit Singh, PSPCL
Ms. Supriya Singh, NRLDC
Shri D.K. Jain, NRLDC
Shri Rajeev Porwal, NRLDC
Shri Rajiv Porwal, NRLDC
Ms. Aprajita Kapoor, NRLDC

Record of Proceedings

Learned counsel for the petitioner and representatives of PSPCL and NRLDC submitted that copy of the report filed by CEA has not been served on them and requested to provide copy of the report to file their comments.

2. The Commission directed the staff of the Commission to give copy of the report of CEA to the petitioner and respondents who may file their comments thereon by 19.9.2014.

3. The Commission directed that due date of filing the comments on CEA`s report should be strictly complied with.

4. The petition shall be listed for hearing on 30.9.2014.

5. The Commission directed CEA to depute an officer well acquainted with the facts of the case on the next date of hearing to assist the Commission.

By order of the Commission

**Sd/-
(T. Rout)
Chief (Law)**



भारत सरकार
विद्युत मंत्रालय
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
ग्रिड प्रबन्धन प्रभाग

Grid Management Division
(टेलीफोन / Telefax : 011-2610 9750)
(ईमेल / E-mail : cegmcea@yahoo.com)
सेवा भवन, आर.के. पुरम-1, नई दिल्ली - 110 066
वेबसाइट/Website : www.cea.nic.in



ISO 9001:2008

सं. 8/X/CERC/GM-2014/1504

दिनांक : 28 अगस्त, 2014

सेवा में,

सचिव,
के.वि.वि. आयोग,
नई दिल्ली।

Secretary,
C.E.R.C.,
New Delhi.

विषय: Record of Proceedings (RoP) held on 15.04.2014 in CERC in Petition No. 157/MP/2013 filed by THDC

महोदय,

This is with reference to Record of Proceedings (RoP) held on 15.04.2014 in CERC in Petition No. 157/MP/2013 filed by THDC. In this RoP, CERC has directed CEA to submit following:

- Technical report with regard to operation of hydro generating stations most optimally and the manner in which storage type and ROR hydro generating stations should be scheduled in day to day operation; and
- As to how the provisions of 2009 Tariff regulations meet the objective of optimal operation of hydro plants.

Our opinion on the above points is as under:

A. Operation & Scheduling of Hydro Power Plants

1. Reservoir based and pondage based Run-of-River (RoR) Hydro Generating stations are normally expected to be utilised as peaking stations. On the other hand, purely RoR hydro stations having no pondage have to be operated based on water inflows. For optimal operation of a hydro-electric

operated based on water inflows. For optimal operation of a hydro-electric plant, it is essential that entire water available is utilised for power generation and no water gets spilled.

2. The generation of a storage / pondage based hydro-electric power station depends on several factors including water-inflows, release of water for irrigation and drinking purposes, peak requirement of beneficiaries, etc. Scheduling of such stations is done based on declared capacity, energy proposed to be generated and requisition from beneficiaries. Based on this information/data, when inflows are less which is normally the case in winter, these stations are used as peaking stations and accordingly, generation schedule is given by RLDC during morning/evening peak hours only. The inflows at times may be too small to facilitate operation of all the generating units at the power station during peak hours. However, during high inflow periods like monsoon season, all hydro stations are scheduled for operation to their capacity almost round the clock depending upon the adequacy of inflows with a view to utilise entire water available and avoid any spillage.
3. As long as a hydro station is able to keep adequate number of machines available for utilisation of entire water available, it should be considered available to that extent. Its optimal operation needs to be ensured by the concerned RLDC through appropriate scheduling in consultation with the beneficiaries of the station. Under clause 6.5.12 of IEGC, the RLDC is duty bound to ensure preparation of schedule and dispatch of RoR (with pondage) and Reservoir based plants so that the available hydro energy is optimally utilised except in case of special system requirements or any constraints.
4. During lean hydro period, generally, no generation is scheduled for storage / pondage based hydro stations during off-peak hours. However, during such off-peak hours on the operating day, the generator may be called upon by the beneficiaries / RLDC to run its machine(s) in case of some emergent situations like major outage of generating stations, reactive power support, etc. Under IEGC provisions, the generator would get 4 time blocks i.e. an

hour, for bringing its machine(s) on bars. However, in case of requirement of black start following a black out, the station may be called upon to run the machine immediately in the shortest possible time frame.

5. Thus, under normal conditions, when a hydro station is not scheduled to generate during off-peak period, there is a possibility that the station may undertake minor maintenance work on its unit(s) subject to the condition that the same would be made available within the period stipulated in the IEGC when required by the RLDC or the beneficiary(ies).
6. It is mentioned in Regulation 22(3) of the Tariff Regulations, 2009 that the Declared Capability (DC) is Ex-bus MW, which the station can deliver for at least three hours. Thus, the generator has to show the availability for at least three hours to qualify for a given DC. Accordingly, for recovery of capacity charge by the hydro station, there is no bar on unit outage except that the station should be capable of making the declared capacity available for at least three hours specified by the RLDC.
7. In the present grid conditions e.g. skewed hydro-thermal mix, less availability of gas, absence of spinning reserve, increasing penetration of renewables, etc., the grid operator is expected to ensure optimum utilization of hydro stations especially reservoir based stations. The judicious use of hydro would facilitate better utilization of renewables and fossil fuels, and would be beneficial for the country in the long run. To promote hydro-electric capacity addition and improve hydro-thermal mix in the country, hydro generators need to be adequately compensated and allowed a liberal treatment. In our opinion, the DC as declared by the generator should be certified by the RLDC for recovery of Capacity Charges if the generator has been capable of generating to the extent of DC for specified 3 hours in a day [as stipulated in Regulation 22(3) of the Tariff Regulations, 2009] irrespective of the fact whether machines were taken under shutdown during zero schedule period.
8. Operationally, RLDC may impose restrictions while allowing shut down for maintenance depending on grid conditions. The RLDC has the option to

check whether the generator is able to bring machine on bars within stipulated period of time, specified in the Regulation . If generator is not able to bring back the machines during this time, a penalty may be imposed in accordance with the regulatory provisions.

9. RoR plants - with or without pondage - need to be exempted from provision of Regulation 7 (11) of Deviation Settlement Mechanism (DSM) Regulations, which requires each entity including a generating station to reverse the sign of its deviation from the schedule after every 12 time-blocks, as this provision may lead to spillage of water.
10. In our view, short duration maintenance of units during zero schedule period would result in improved reliability of the units during the intended period of generation. However, all the units at the station should not be taken out at the same time, so that in case of an emergency requirement including black start requirement, it is possible for the station to bring at least one unit on bars without any delay. However, this type of maintenance should be done under intimation to the RLDC.

In view of the above, for optimal operation of hydro-electric power stations, the following is suggested:

- a) **The judicious use of hydro-electric power stations is essential for better utilization of renewables and fossil fuels, and would be beneficial for the country in the long run.**
- b) **Hydro generators should be adequately compensated and allowed a liberal treatment to promote hydro-electric capacity addition in the country, thereby leading to much needed improved hydro-thermal mix in the country.**
- c) **For optimal operation of a hydro-electric plant, it is essential that entire water available is utilised for power generation and no water gets spilled.**
- d) **RoR plants - with or without pondage - need to be exempted from provision of Regulation 7 (11) of Deviation Settlement Mechanism (DSM) Regulations, which requires each entity including a generating station to**

reverse the sign of its deviation from the schedule after every 12 time-blocks, as this provision may lead to spillage of water.

- e) As long as a hydro station is able to keep adequate number of machines available for utilisation of entire water available, it should be considered available to that extent.
 - f) The DC as declared by the generator should be certified by the RLDC for recovery of Capacity Charges if the generator has been capable of generating to the extent of DC for specified 3 hours in a day [as stipulated in Regulation 22(3) of the Tariff Regulations, 2009] irrespective of the fact whether machines were taken under shutdown during zero schedule period.
 - g) There should be no bar on Hydro stations to carry out short duration maintenance of units during zero schedule period. However, such maintenance should be done under intimation to the RLDC. Further, all the units at the station should not be taken under maintenance at the same time.
- B. How the provisions of Tariff Regulations, 2009 meet the objective of optimal operation of hydro plants**

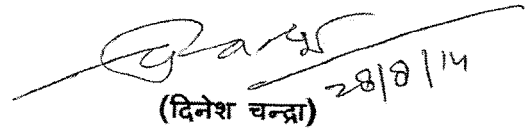
Regarding the provisions of Tariff Regulation, 2009 which facilitate optimal operation of hydro plants, it is to state that for optimal operation of hydro power plants, it is necessary for the hydro station to ensure that its machines are available to utilise the entire water available and there is no spillage. As per Regulation 22 of Tariff Regulations, 2009, Annual Fixed Charges (AFC) of a hydro station are to be recovered in two parts i.e. 50% through Capacity Charge and 50% through Energy Charge. With this provision in place, if the water is spilled by a hydro station due to outage of its machine(s), the station will not only lose a portion of its capacity charge due to reduced Plant Availability Factor but also lose a portion of its energy charge equivalent to spilled water. This may work out to be substantial commercial loss to the

station. This provision, therefore, encourages the hydro stations to keep the necessary machines available to utilise the entire water available in any season of the year, thereby ensuring optimal operation.

However, the above provision of recovery of AFC through Capacity Charge and Energy Charge in 50:50 ratio, leads to high energy charge rate of a few hydro stations - particularly new hydro stations - thereby, pushing them down even below some thermal power stations in the merit order list. In that case, such hydro stations may not get priority in despatch from the beneficiaries, especially under low demand conditions, which may cause spillage of water, and therefore, sub-optimal operation of such plants.

In order to ensure optimal operation of all the hydro power plants, it is essential that at least R-o-R hydro stations with pondage and pure R-o-R hydro stations, where spillage is more likely to occur, remain at the top of the merit order list. One option could be to change the ratio of bifurcation of AFC between Capacity and Energy Charge to, say 60:40, which could be reviewed subsequently with increase in variable cost of thermal power stations.

भवदीय,


28/8/14

(दिनेश चन्द्रा)

मुख्य अभियन्ता प्रभारी (.ग्रिड प्रब)