

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 157/MP/2013

Coram

Shri Gireesh B Pradhan, Chairperson

Shri A.K. Singhal, Member

Shri A.S. Bakshi, Member

Date of Hearing: 30.09.2014

Date of Order: 10.07.2015

In the matter of

Petition under Regulation 22(3) of CERC (Terms & Conditions of Tariff) Regulations, 2009 for revision of Declared Capacity for a day (in MW) for the generating stations of the Petitioner-**THDC India Limited**

And in the matter of

THDC India Ltd
Pragatipura, Bypass Road,
Rishikesh- 249201 (Uttarakhand)

.....**Petitioner**

Vs

1. Northern Regional Load Despatch Centre
Power System Operation Corporation (POSOCO)
Qutab Institutional Area
Katwaria Sarai, New Delhi – 110016

2. Punjab State Power Corporation Limited
Shakti Sadan, The Mall, PSPCL
Patiala-147001

.....**Respondents**

Parties Present

Shri M.G.Ramachandran, Advocate, THDC
Ms. Anushre Bardhan, Advocate, THDC
Ms. Poorva Saigal, Advocate, THDC
Shri Santosh Majid Siddiqi, THDC
Shri J.K. Hatwal, THDC
Shri Padamjit Singh, PSPCL
Ms. Supriya Singh, NRLDC
Shri D.K. Jain, NRLDC
Shri A.Mani, NRLDC
Shri Rajiv Porwal, NRLDC



ORDER

The core issue raised in the present petition is regarding the interpretation of Clause (3) of Regulation 22 of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 (the 2009 Tariff Regulations). The petitioner has made the following prayers:

“a) Clarify the legal position concerning the interpretation of Regulation 22(3) and Regulation 3(13) and (14) of the Tariff Regulations, 2009 and direct that so long the petitioner or any hydro generator is fulfilling the requirements of Regulation 22(3), there shall be no deduction or adjustment for the machines being taken for shut down/planned maintenance during the remaining period of the day; and

b) Pass any such further order or orders as deemed fit in the facts and circumstance of the case.”

2. The petitioner has established reservoir-based hydro stations, namely Tehri Hydro Electric Project Stage-I (4 x 250 MW) (Tehri HEP) and Koteshwar Hydro Electric Project (4 x 100 MW) (Koteshwar HEP) in the State of Uttarakhand. These hydro stations have been commercially operative since 9.7.2009 and 1.4.2012 respectively.

3. The petitioner has stated that the Declared Capacity (DC) of its hydro stations given by it used to be accepted by Northern Regional Load Despatch Centre (NRLDC) for the purpose of clause (3) of Regulation 22, that is, for computing Plant Availability Factor (PAF) achieved during the month (PAFM). However, it has been stated, in June 2012, NRLDC suddenly changed the methodology. The petitioner has alleged that since June 2012 NRLDC has been averaging DC for the day when the machines are taken for shut down or planned maintenance during a part of the day, even though they were available for 3 hours during the day. According to the petitioner, the revised methodology is contrary to the express provisions of clause (3) of Regulation 22.

4. The petitioner has stated that it pointed out the anomaly to NRLDC under its letters dated 14.6.2012, 30.6.2012 and 6.7.2012 and sought rectification, but without success. Thereafter, the petitioner raised the issue at the Northern Region Power Committee (NRPC) forums. The issue was first raised at 23rd meeting of TCC held on 12.7.2012. At the said meeting the petitioner and NRLDC were advised to mutually resolve the issue. Thereafter, the issue was raised at 22nd Commercial Sub-Committee meeting of NRPC held on 13.10.2012. At the said meeting, the representative of NRLDC explained that in accordance with clauses (13) and (14) of Regulation 3, the petitioner is to declare DC for all 24 hours of the day (00 hrs to 24 hrs). It was further explained by the representative of NRLDC that on certain occasions the machines were shown by the petitioner to be undergoing shutdown or maintenance during a part of the day. NRLDC further explained that such machines could not be considered to be capable of generating or delivering electricity for the entire day since they were unable to generate in the event of any unforeseen contingency in the grid and as such the periods of shutdown or planned outage could not be considered for computing PAFM. Thus, NRLDC explained that DC was being worked out by averaging the availability of the machines during the day. The issue was again raised at 24th meeting of TCC held on 29.11.2012 when it was decided that the issue be resolved at the separate meeting at NRPC Secretariat. As the issue has remained unresolved, the present petition has been filed.

5. According to the petitioner, in terms of clause (3) of Regulation 22, DC (ex-bus) for the day is the energy which the hydro station can deliver for minimum of 3 hours of the day. The petitioner has submitted that so long as it declared DC for not less than 3 hours in a day the condition laid down under clause (3) of Regulation 22 was duly complied with and thus there could be no justification for averaging to arrive at DC for the day. In the

context of the definitions of 'day' and 'declared capacity' given in clauses (13) and (14) of Regulation 3, the petitioner has stated that these definitions apply "unless context otherwise requires" as specified in the opening part of Regulation 3 and that in the context of clause (3) of Regulation 22 the definition of 'declared capacity' given under clause (14) of Regulation 3 does not apply. The petitioner has pointed out that the statutory framework applicable prior to coming into force of the 2009 Tariff Regulations contained a similar provision for computation of DC, but averaging was not resorted to for considering DC of the generating units so long as they were able to generate for 3 hours during the day.

6. The petitioner has submitted that the 2009 Tariff Regulations do not put any embargo on the petitioner to undertake maintenance work during zero schedule period, that is, the time when the machines are not scheduled for generation and it is rather a prudent practice to attend to the machines during such time and keep the machines intact and ready for the time when the generation is required. The interpretation sought to be placed by NRLDC amounts to interfering with the prudent utility practices, the petitioner has alleged.

7. NRLDC has filed a reply under its affidavit dated 26.3.2014. NRLDC has reiterated the position explained at 22nd Commercial Sub-Committee meeting of NRPC held on 13.10.2012. According to NRLDC, availability of machines is a necessary condition for DC computation or else the machines under shutdown/maintenance would not be able to generate to meet the requirement of users or for revival of the system under any unforeseen and sudden contingencies in the grid such as transmission constraints, frequency instability etc. NRLDC has stated that the practice is uniformly followed and all generating stations in Northern Region are treated similarly. NRLDC has submitted that

vide its letter dated 22.6.2012 the petitioner was informed of its views. NRLDC has clarified that availability is averaged only when all the units are simultaneously under shutdown and not in cases when some of the units or a single unit is under shutdown, since in latter cases the generating station can generate power, though to a limited extent, to meet the users emergent demand or the demands of the grid in the event of any unforeseen contingency.

8. By relying upon para 33.1.2 of the Statement of Reasons (SOR) issued by the Commission in support of the 2009 Tariff Regulations, NRLDC has urged that the peaking capacity is based on the presumption that one unit of the hydro station would be under annual maintenance during months of May, July, February and March. Therefore, NRLDC has argued that the target Normative Annual Plant Availability Factor (NAPAF) specified by the Commission takes into account the planned shutdown on account of maintenance and silt factors etc. Based on the observations in the Statement of Reasons, NRLDC has disputed the correctness of the petitioner's plea that there can be no restriction to undertake maintenance works during the hours when the machines are to remain idle and yet can claim full capacity charges based on DC given for 3 hours of the day. NRLDC has emphasized that machine availability round-the-clock is important for reservoir-based hydro stations as they can help the grid to maintain power supply during hours of need. NRLDC has brought out that despite revision of methodology for calculating DC during last 3 years Tehri HEP achieved higher PAF than NAPAF of 77% and has furnished the following details of the actual PAF:

Year	PAF Achieved (%)
2011-12	85.671
2012-13	91.310
2013-14 (upto February, 2014)	92.409

9. At the hearing on 15.4.2014 the Commission directed NRLDC to file the methodology adopted for scheduling of hydro stations and a detailed note on methodology of scheduling and computation of availability. The Commission also directed CEA to furnish a technical report with regard to optimal operation of hydro stations, the manner in which storage type and run-of-river (ROR) hydro stations should be scheduled in day-to-day operation, and information as to how the provisions of the 2009 Tariff Regulations meet the objective of optimal operation of hydro stations.

10. NRLDC under its affidavit dated 9.5.2014 has furnished the following information:

- (a) the provisions of Grid Code applicable to scheduling of hydro stations,
- (b) timelines for exchange of information for day ahead scheduling,
- (c) formats for declaration by hydro station,
- (d) methodology for finalization of schedules adopted by NRLDC, and
- (e) methodology for computation of DC for hydro generating stations.

11. NRLDC has again explained that for computation of DC of the hydro stations with pondage and reservoir-based hydro stations, maximum MW declared during 3 peaking hours is taken, these three hours could be made up by one and half hour each during morning and evening peak hours, if so declared. It has stated that though normally the hydro station is scheduled during peak hours as per declaration, they can be scheduled high during off-peak hours as well. NRLDC has reiterated that for the purpose of considering DC of the day, scheduling is considered as per declaration of the hydro station, subject to the conditions that the units were available during peak hours and at least one unit is actually available (may not be on bar due to energy limitation) for generation throughout the day. NRLDC has explained the methodology through example of DC of Tehri HEP on 10.6.2012 and 18.12.2012. It has pointed out that on 10.6.2012 as

all units of Tehri HEP were not available for certain time blocks during the day and the hydro station was under complete outage, calculation of DC was made on an average basis.

12. CEA has conveyed its views vide letter dated 28. 8.2014. CEA has stated that reservoir and pondage based run-of-river (ROR) hydro stations are normally expected to be utilized as peaking stations. On the other hand, purely ROR hydro stations having no pondage or reservoir have to be operated based on water inflows since for optimal operation of a hydro station, it is essential that entire water available is utilized for power generation and no water gets spilled. CEA has recommended that 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.

13. On the specific issues arising in the present petition, CEA has stated that as long as adequate number of machines are available for utilization of available water, the hydro station should be considered available to that extent. However, CEA has opined, DC declared by the generator should be certified by the RLDC for recovery of the capacity charges if the generating station has been capable of generating to the extent of DC for specified 3 hours in a day, irrespective of the fact whether machines were taken under shutdown during zero schedule hours as there can be no bar on hydro stations to carry out short duration maintenance of units during these hours, under intimation to the RLDC.. However, CEA has also opined that all the units at the station should not be taken under maintenance at the same time, so that in case of an emergency including black start

requirement, it is possible for the hydro station to bring at least one unit on bars without delay.

14. On the question of facilitation of optimal operation of hydro stations, CEA has stated that it is necessary for the hydro stations to ensure that its machines are available to utilize the available water and there is no spillage. CEA has recommended changing the ratio of bifurcation of Annual Fixed Charges of a hydro station between capacity charge and energy charge to, say 60:40, against the ratio of 50:50 specified under Regulation 22 of Tariff Regulations, 2009. The recommendation has been made as in the opinion of CEA it would ensure optimal operation of all the hydro stations, in particular, ROR hydro stations, with pondage or without pondage, where spillage is more likely to occur, as they would remain at the top of the merit order list. CEA has brought out that with Regulation 22 in place, if the water is spilled by a hydro station due to outage of its machine(s), the hydro station not only loses a portion of its capacity charge due to reduced PAF but also loses a portion of its energy charge equivalent to spilled water. CEA has further recommended that ROR hydro stations, 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.

15. Punjab State Power Company Ltd (PSPCL), which though not formally impleaded as a party was permitted to file its submissions on the issue raised in the petition and accordingly PSPCL has filed its affidavit, dated 26.9.2014. According to PSPCL, "Availability" for the purpose of calculating PAF (Plant Availability Factor) means that the unit capacity should be available to the beneficiaries to meet their requirement or of

RLDC. It has submitted that when a unit or station is taken out on maintenance or is under shutdown, it is not available to the beneficiaries. In such an event, the generating station cannot claim full capacity charge, PSPCL has urged. PSPCL has argued that the implementation of clause (3) of Regulation 22 in the manner demanded by the petitioner invalidates the very concept of “Availability” since it leads to a situation whereby a unit or station though not available recovers the capacity charge. PSPCL has explained that acceptance of the petitioner’s argument results in an anomalous situation as in an extreme situation by remaining under shutdown for 21 hours during the day; the generating station recovers full capacity charge by declaring DC for just 3 hours.

16. Adopting the argument made by NRLDC, PSPCL has stated that if during the period of shutdown the unit/generating station is required to be run as per requirement of the beneficiaries or RLDC but is not run because of it being under maintenance, it operates to the disadvantage of the beneficiaries as the petitioner gets twofold gain at the cost of the beneficiaries; it not only gets higher capacity charge but also earns incentive by the inflated “Availability”. PSPCL has furnished the following details of PAFM of the hydro stations of the petitioner achieved during 2013-14:

Month 2013-14	Tehri HEP PAF (%)	Koteshwar HEP PAF (%)
April	43.32	75.68
May	44.30	66.07
June	66.94	81.20
July	92.04	95.04
August	107.21	94.52
September	107.29	74.60
October	107.29	54.58
November	107.29	25.93
December	107.03	47.24
January	101.54	70.71
February	94.21	75.76
March	67.46	87.27
Average	87.16	70.3
NAPAF (%)	77	67

17. According to PSPCL, the storage type hydro stations represent an energy source that can be pressed into service at short notice to inject extra power into the grid when there is a contingency of low frequency caused by outage of thermal station or grid separation etc. By its very nature a hydro station has the biggest advantage that standby units can be brought on bar, in any contingency, within a short time without waiting for the 4 time blocks. Therefore considering that a grid contingency can arise any time, a hydro station is supposed to be in a position to respond to any unforeseen and sudden contingency and under black start condition.

18. At the hearing on 30.9.2014, the Commission directed NRLDC to submit specific instances where Tehri HEP and other pondage/storage based hydro stations were called upon to provide system support during off-peak hours. NRLDC vide its reply dated 20.10.2014 has furnished the following instances during 2013-14, (December 2013, January 2014 and February 2014), when in the contingency situations, Tehri HEP and other hydro power stations of Northern Region were called upon to provide system support during off-peak periods:

Tehri HEP	Nathpa Jhakri HEP	Chamera HEP Stage I
17.12.2013	09.12.2013	03.02.2014
24.12.2013	12.12.2013	04.02.2014
05.01.2014	21.12.2013	07.02.2014
13.01.2014	23.12.2013	08.02.2014
14.01.2014	07.01.2014	12.03.2014
16.01.2014	18.01.2014	14.03.2014
17.01.2014	13.02.2014	19.03.2014
18.01.2014	15.02.2014	20.03.2014
21.01.2014	18.02.2014	21.03.2014
22.01.2014	04.03.2014	29.03.2014
07.02.2014	11.03.2014	-
16.02.2014	21.03.2014	-

19. We have heard the learned counsel for the petitioner and representatives of NRLDC and PSPCL. We have also gone through the pleadings of the parties and their written submissions. We have also considered the technical report of CEA.

20. We first consider the core issue of computation of PAFM of a hydro station for recovery of capacity charge.

21. According to the petitioner, it is not necessary for the hydro station to declare its capability to generate or deliver electricity for all 96 time blocks of the day. It has been argued on behalf of the petitioner that so long as the capability of the hydro station to generate power for three hours during the day is communicated to the nodal RLDC, PAFM and consequently the capacity charge has to be computed based on such declaration. On the other hand, the view of NRLDC is that the expression 'declared capacity' figuring in the explanation of DCi under clause (3) of Regulation 22 is to be read in the light of the term defined under clause (14) of Regulation 3 and they have urged that at least one unit of hydro station should be capable of generation for all the 96 time blocks of the day to meet any emergency situation and in addition the hydro station should also be capable of generation for at least three hours during the day. PSPCL has supported NRLDC on the substantive issue. The controversy involves interpretation of clause (3) of Regulation 22 of the 2009 Tariff Regulations read with clauses (13) and (14) of Regulation 3. For proper appreciation of the controversy, it is necessary to take notice of the relevant provisions of the 2009 Tariff Regulations.

22. The term 'declared capacity' or 'DC', defined under clause (14) of Regulation 3 is extracted below:

“(14) ‘declared capacity’ or ‘DC’ in relation to a generating station means, the capability to deliver ex-bus electricity in MW declared by such generating station in relation to any time-block of the day or whole of the day, duly taking into account the availability of fuel or water, and subject to further qualification in the relevant regulation.”

23. ‘Day’ has been defined under clause (13) of Regulation 3 to mean as 24 hours starting at 00:00 hrs. Thus, ‘Day’ starts at 00:00 hrs and ends at 24:00 hrs.

24. The term ‘declared capacity’ or ‘DC’ read with the definition of ‘day’ has the following ingredients, namely:

- (a) DC is the capability of the generating station to deliver electricity at the bus bar.
- (b) The capability is declared by the generating station itself.
- (c) The capability may be declared for the whole day or part of it, that is, any of the time blocks between 00 hrs to 24 hrs.

25. Clauses (2) and (3) of Regulation 22 lay down the methodology for computation of capacity charge and is reproduced hereunder:

“22. Computation and Payment of Capacity charge and Energy Charge for Hydro Generating Stations.

(1)

(2) *The capacity charge (inclusive of incentive) payable to a hydro generating station for a calendar month shall be*

$$AFC \times 0.5 \times NDM / NDY \times (PAFM / NAPAF) \text{ (in Rupees)}$$

Where,

AFC = Annual fixed cost specified for the year, in Rupees.

NAPAF = Normative plant availability factor in percentage

NDM = Number of days in the month

NDY = Number of days in the year

PAFM = Plant availability factor achieved during the month, in Percentage

(3) The PAFM shall be computed in accordance with the following formula:

$$PAFM = 10000 \times \frac{\sum_{i=1}^N DC_i}{\{N \times IC \times (100 - AUX)\}} \%$$

Where,

AUX = Normative auxiliary energy consumption in percentage

DC_i = **Declared capacity (in ex-bus MW) for the *i*th day of the month which the station can deliver for at least three (3) hours, as certified by the nodal load despatch centre after the day is over.**

IC = Installed capacity (in MW) of the complete generating station

N = Number of days in the month.”

26. A reading of clause (2) suggests that the monthly capacity charge which becomes due after expiry of the month depends, *inter alia*, upon PAF “achieved” during the month (PAFM). The word “achieved” suggests that PAF for the month or PAFM is calculated *post facto*. PAF is defined under clause (30) of Regulation 3 as the average of the daily declared capacities (DCs) for all the days of any period for which PAF is calculated. Therefore, PAFM is the average of daily DCs for a month. As already seen ‘declared capacity’ or ‘DC’ is the capability of the generating station to deliver ex-bus electricity in MW declared by it. From clause (2) it therefore follows that PAFM is the monthly average of daily DCs declared in MW, by the hydro station.

27. Clause (3) of Regulation 22 specifies that PAFM is directly proportional to DC_i. According to the explanation of DC_i given under clause (3), DC_i is the ‘declared capacity’ for any day (*i*th day, where *i* ranges from 1 to actual number of days in a month) of the month, which the hydro station “*can deliver*” for atleast three hours. Although the expression used is “can deliver” it in fact means the capacity “delivered” since the certificate of the capacity which the hydro station “can deliver” is issued by the nodal

RLDC “*after the day is over*”. Therefore, DCi for the purpose of computation of PAFM under clause (3) of Regulation 22 also refers to the capacity actually delivered as certified by the nodal RLDC.

28. Reading of clauses (2) and (3) of Regulation 22 leads to the conclusion that PAFM is the average daily capacity actually delivered during each day of the month and daily capacity actually delivered for atleast three hours shall be taken as DCi for calculating PAFM.

29. From the above, it can be seen that whatever may be the capability declared by the hydro station to deliver power during the day or part of the day, PAFM is to be worked out on the basis of capacity delivered for a minimum of 3 hours of the day. There is nothing either in clause (2) or clause (3) of Regulation 22 to suggest calculation of DCi on average basis if the station takes out all the machines after providing peaking support for three hours. Neither the 2009 Tariff Regulations nor the Grid Code governing scheduling procedures of hydro station specify that the hydro station is required to make provision for availability of at least one unit of the hydro station for 24 hours, apart from providing peaking capability of the hydro station for three hours, to meet the unforeseen contingencies. It also bears notice that the Normative Annual Plant Availability Factor of 77% in case Tehri HEP and 67% in case of Koteshwar HEP has been worked out based on yearly availability for 3 hours of the day.

30. In the light of above discussions and provisions of the 2009 Tariff Regulations, we hold that clause (3) of Regulation 22 of the 2009 Tariff Regulations does not support the view of the respondents that DCi for the purpose of PAFM should be calculated by averaging the declared capacity of the day, if the generator takes out all the units, even for

one time block, after providing peaking support for three hours. Accordingly, it is held that PAFM of the hydro stations is to be computed based on capacity delivered by them for at least three hours during the day as certified by NRLDC. There is no dispute that Tehri HEP and Koteshwar HEP delivered energy for 3 hours each day during the disputed period. In view of these findings, NRLDC is directed to re-calculate PAFM and consequently the capacity charges from June 2012 and onwards within 3 months from the date of this order by taking DCi as the capacity actually delivered for at least 3 hours of the day. The beneficiaries who will be billed the revised capacity charge shall settle the dues (after adjusting the capacity charge already paid) within next 3 months, following the month of communication of the revised capacity charges. No interest shall be payable in case the excess capacity charge is paid by the beneficiaries within the time allowed. However, in case payment is delayed, the beneficiaries shall pay interest at the rate of 15% per annum for the period of delay.

31. We have decided the core issue of computation of PAFM raised in the petition on strict interpretation of the plain language of the 2009 Tariff Regulations. However, at this stage we deem it necessary to bring out certain concerns arising out of the above interpretation.

32. The interpretation accepted by us in this order means that in extreme situation the hydro station recovers full capacity charge even when it remains under shutdown or planned maintenance for 21 hours in the day, as pointed out by NRLDC as well as PSPCL. Though it may rarely happen but the same cannot be altogether ruled out. This is not considered desirable. As pointed out by NRLDC and also endorsed by PSPCL, availability of units of hydro stations is of extreme importance for reliability of the grid.

NRLDC has furnished the instances where Tehri HEP and other hydro stations in Northern Region were called upon to provide system support during off-peak hours. Therefore availability of hydro station is of essence for sustained and secure operation of the grid. Non-availability of hydro stations can lead to serious problems for the grid operation, especially in case of an emergency. Merely because a hydro station is not called upon to generate during the night hours or is called upon to generate only during three hours in a day cannot mean that it should get recovery of full capacity charge for the three hours' peak generation and can remain under shutdown for the remaining hours of the day. CEA has also opined that all the units of the hydro station should not be taken under maintenance at the same time so that in case of an emergency including black start requirement, it is possible to bring at least one unit on bars without much delay, though, according to CEA, there should be no bar on hydro stations to carry out short duration maintenance of units during zero schedule hours.

33. We find force in the submission of PSPCL that computing PAFM based on 3 hours generation in a day without corresponding benefit for the remaining 21 hours, causes serious prejudice to the beneficiaries. The beneficiaries pay not only the capacity charge but the incentive also, irrespective of whether or not the hydro station is available for generation and results in extra earnings for hydro station.

34. The provisions similar to that in Regulation 22 of the 2009 Tariff Regulations are contained in the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014, applicable for the period 2014-19. We direct the Staff of the Commission to process amendment of the 2014 Tariff Regulations and the Grid Code, where necessary within 3 months from the date of this order, to rectify the anomalies

pointed out by NRLDC/PSPCL and briefly noticed above in strict operation of Regulations 22 of the 2009 Tariff Regulations.

35. With the above directions, the petition stands disposed of.

-Sd/-
(A. S. Bakshi)
Member

-Sd/-
(A.K. Singhal)
Member

-Sd/-
(Gireesh B Pradhan)
Chairperson