

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Petition No.369/MP/2018**

**Coram:**

**Shri P. K. Pujari, Chairperson  
Shri I.S. Jha, Member  
Shri Arun Goyal, Member**

**Date of Order: 19.3.2021**

**In the matter of**

Application under Regulation-31(6) of CERC (Terms and Conditions of Tariff) Regulations, 2014 for recoupment of under-recovered energy charges due to shortfall in energy generation for reasons beyond the control of the Generating Station during the FY 2016-17 in respect of Bairasiul Generating Station.

**And**

**In the matter of**

NHPC Limited  
(A Govt of India Enterprise)  
NHPC Office Complex,  
Sector – 33,  
Faridabad –121 003

**...Petitioner**

**Vs**

1. The Chairman & Managing Director  
Punjab State Power State Corporation Limited,  
The Mall, Near Kali Badi Mandir  
Patiala - 147 001 (Punjab)

2. The Chairman,  
Haryana Power Utilities (UHBVNL & DHBVNL),  
Shakti Bhawan , Sector-6, Panchkula-134109 (Haryana)

3. The Chief Executive Officer,  
BSES Rajdhani Power Ltd., BSES Bhawan,  
Nehru Place, New Delhi-110019

4. The Chief Executive Officer,  
BSES Yamuna Power Ltd.,  
Shakti Kiran Building,  
Karkardooma, Delhi-II 0 072.



5. The Chief Operating Officer,  
Tata Power Delhi Distribution Ltd.  
33 kV Sub-Station Building,  
Hudson Lane, Kingsway Camp,  
New Delhi-110 009.

6. The Chairman,  
Himachal Pradesh State Electricity  
Board,  
Vidyut Bhawan, Kumar House,  
Shimla 171004 (Himachal Pradesh).

...Respondents

**Parties present:**

Shri Rajiv S. Dwivedi, Advocate, NHPC  
Shri M. G. Gokhale, NHPC  
Ms. Swapna Sheshadri, Advocate, PSPCL  
Shri Amal Nair, Advocate, PSPCL  
Shri Ankit Bansal, PSPCL  
Shri R. B. Sharma, Advocate, BRPL  
Shri Himanshu Chauhan, BRPL  
Ms. Meghan Bajpeyi, BRPL  
Shri Mohit Mudgal, Advocate, BYPL

**ORDER**

The Petitioner, NHPC Ltd. (in short, NHPC) has filed this petition seeking the following relief(s):

*“a) Hon’ble Commission may kindly allow recovery of energy charges amounting to ₹8.12 crore against the shortfall in generation of 79.31 MU beyond the control of Petitioner as per regulation 31(6)(b) of CERC Tariff Regulations, 2014.*

*b) To allow issuance of supplementary bills for recovery of shortfall in energy charges amounting to ₹8.12 crore as per regulation 31(6)(b) of CERC Tariff Regulations, 2014.*

*c) To allow issuance of supplementary bills after truing up of tariff for period 2016-17.*

*d) Pass such other and further order / orders as are deemed fit and proper in the facts and circumstances of the case.”*

2. The Bairasiul Generating Station (hereinafter called 'the Generating Station') (3x60 MW = 180 MW) located in the State of Himachal Pradesh, is under commercial



operation w.e.f. 01.04.1982 and the Generating Station has completed its useful life on 31.03.2017.

3. The power generated from the Generating Station is being supplied to six bulk power-customers/ beneficiaries/ successor utilities in Northern Region. The approved annual Design Energy (DE) of the Generating Station is 779.28 MU and keeping in view the provision of 1% auxiliary losses and 12% free power to home state, the saleable energy is 678.91 MU.

4. Since the Generating Station is under commercial operation since 01.04.1982, it has completed more than 10 years of operation. The present application is for recovery of shortfall in energy charges due to shortfall in generation as per Regulation 31(6)(b) of the CERC (Terms and Conditions of Tariff) Regulations, 2014 (hereinafter referred to as “the 2014 Tariff Regulations”), which is reproduced below:

*“31(6) In case the actual total energy generated by a hydro Generating Station during an year is less than the Design Energy for reasons beyond the control of the Generating Station, the following treatment shall be applied on a rolling basis on an application filed by the generating company:*

*(b) In case the energy shortfall occurs after ten years from the date of commercial operation of a Generating Station, the following shall apply.*

*Explanation: Suppose the specified annual Design Energy for the station is DE MWh, and the actual energy generated during the concerned (first) and the following (second) financial years is A1 and A2 MWh respectively, A1 being less than DE. Then, the Design Energy to be considered in the formula in clause (5) of these regulations for calculating the ECR for the third financial year shall be moderated as  $(A1 + A2 - DE)$  MWh, subject to a maximum of DE MWh and a minimum of A1 MWh.”*

### **Submissions of the Petitioner**

5. The Petitioner in this petition has submitted as under:

(a) The present petition has been filed in order to suitably modify the Energy Charge Rate (ECR) in terms of Regulation 31(6)(b) of the 2014 Tariff Regulations for recovery of under-recovered energy charges of FY 2016-17 in



FY 2018-19 due to shortfall in generation. The break-up of actual generation vis-à-vis Design Energy is tabulated below:

|                                     |           |                  |
|-------------------------------------|-----------|------------------|
| Actual Generation during FY 2016-17 | A1        | 669.20 MU        |
| Actual Generation during FY 2017-18 | A2        | 641.69 MU        |
| <b>Design Energy</b>                | <b>DE</b> | <b>779.28 MU</b> |

(b) From the above table,  $(A1+A2-DE) = 531.61$  MU which is less than the Design Energy of the Generating Station i.e., 779.28 MU. Hence, as per Regulation 31(6)(b) of the 2014 Tariff Regulations, the Energy Charge Rate (ECR) for FY 2018-19 needs to be modified so as to ensure recovery of under recovered energy charges of FY 2016-17.

(c) Month-wise break-up of actual generation, vis-a-vis Design Energy during FY 2016-17 is tabulated below:

| S. No.       | Month  | Design Energy (MU) | Actual Generation at GT (MU) | Shortfall/ Excess (MU) |
|--------------|--------|--------------------|------------------------------|------------------------|
| 1            | 2      | 3                  | 4                            | 5=4-3                  |
| 1            | Apr-16 | 97.85              | 82.56                        | -15.29                 |
| 2            | May-16 | 106.00             | 79.39                        | -26.61                 |
| 3            | Jun-16 | 92.80              | 68.98                        | -23.82                 |
| 4            | Jul-16 | 109.24             | 73.93                        | -35.31                 |
| 5            | Aug-16 | 115.08             | 97.10                        | -17.98                 |
| 6            | Sep-16 | 59.86              | 59.80                        | -0.06                  |
| 7            | Oct-16 | 35.39              | 30.33                        | -5.06                  |
| 8            | Nov-16 | 25.22              | 18.15                        | -7.07                  |
| 9            | Dec-16 | 22.21              | 14.79                        | -7.42                  |
| 10           | Jan-17 | 23.81              | 23.15                        | -0.66                  |
| 11           | Feb-17 | 29.43              | 53.29                        | 23.86                  |
| 12           | Mar-17 | 62.39              | 67.74                        | 5.35                   |
| <b>Total</b> |        | <b>779.28</b>      | <b>669.20</b>                | <b>-110.08</b>         |

(d) Thus, there is shortfall of 110.08 MU (779.28 MU – 669.20 MU), in generation during FY 2016-17. The reasons for shortfall are as under:



| <b>A. Shortfall due to reasons beyond the control of Petitioner</b>   |                    |
|---|--------------------|
| Energy shortfall due to less inflow from design inflow on some days   | -120.81 MU         |
| Energy generated due to excess inflow from design inflow on some days   | 54.75 MU           |
| Energy loss due to silt flushing  | -13.25 MU          |
| <b>Total (A)</b>  | <b>-79.31 MU</b>   |
| <b>B. Shortfall due to reasons within the control of Petitioner</b>   |                    |
| In order to meet grid requirements, sometimes powerhouse is operated at higher load resulting into depletion of reservoir and at suitable time, reservoir is to be filled again causing loss of generation. In this process, the figure of gain/loss of energy is as under: |                    |
| Energy generated by depleting reservoir level on some days  | 12.05 MU           |
| Less generation for increasing reservoir level on some days   | -22.15 MU          |
| Unit Outage   | -0.95 MU           |
| Other constraint (Partial load/ramping up/down during peaking/ high inflow/ Tail Race Tunnel level etc.   | -19.73 MU          |
| <b>Total (B)</b>  | <b>-30.77 MU</b>   |
| <b>Net Generation Loss (A+B)</b>  | <b>- 110.08 MU</b> |

(e) In terms of above table, out of total shortfall of 110.08 MU, shortfall of 79.31 MU was beyond the control of the Petitioner and shortfall of 30.77 MU is attributable to the Petitioner. Hence, recovery on account of generation shortfall of 79.31 MU needs to be allowed during FY 2018-19 as per Regulation 31(6)(b) of the 2014 Tariff Regulations.

(f) Present claim is based on tariff allowed by the Commission for FY 2016-17, vide order dated 17.06.2015 in petition no. 235/GT/2014, which is produced as below:

| <b>Design Energy (MU)</b> | <b>Aux. Consumption (MU)</b> | <b>Free Energy (MU)</b> | <b>Saleable Energy (MU)</b> | <b>Annual Fixed Charges (crore)</b> | <b>Allowed Energy Charges (crore)</b> | <b>ECR (₹/Unit)</b> |
|---------------------------|------------------------------|-------------------------|-----------------------------|-------------------------------------|---------------------------------------|---------------------|
| <b>1</b>                  | <b>2</b>                     | <b>3</b>                | <b>4=1-(2+3)</b>            | <b>5</b>                            | <b>6=50% of 5</b>                     | <b>7</b>            |
| 779.28                    | 7.79                         | 92.58                   | 678.91                      | 133.55                              | 66.77                                 | 0.984               |

(g) Actual generation and actual recovered energy charges are as under:



| Schedule*<br>Energy (Ex-<br>Bus) (MU) | Free*<br>Energy<br>(MU) | Net<br>Energy<br>Billed<br>(MU) | ECR<br>(₹/Unit) | Allowed<br>Energy<br>Charges<br>(crore) | Energy<br>Charges<br>actually<br>recovered<br>(crore) | Under<br>recovery of<br>Energy<br>Charges<br>(crore) |
|---------------------------------------|-------------------------|---------------------------------|-----------------|---|---|--|
| 1                                     | 2                       | 3=1-2                           | 4               | 5                                       | 6=3x4   | 7=5-6  |
| 640.96                                | 76.91                   | 564.05                          | 0.984           | 66.77                                   | 55.50   | 11.27  |

\* Schedule Energy & Free Energy are based on Regional Energy Account issued by NRPC

(h) In FY 2016-17, the Petitioner has recovered energy charges amounting to ₹55.50 crore corresponding to saleable scheduled energy of 564.05 MU, against energy charges of ₹66.77 crore (50% of AFC) as allowed by the Commission in tariff order dated 17.06.2015 in petition no. 235/GT/2014. Hence, there is under-recovery of energy charges amounting to ₹11.27 crore.

(i) Out of total generation shortfall of 110.08 MU, shortfall of 79.31 MU is beyond the control of the Petitioner and corresponding shortfall of energy charge amounting to ₹8.12 crore (out of shortfall of ₹11.27 crore) may be allowed to recover in FY 2018-19 . Details are as under:

|   |         |                    |
|---|---------|--------------------|
| Total Shortfall in generation during FY 2016-17               | A       | 110.08 MU          |
| Total under recovery of energy charges during FY 2016-17      | B       | ₹11.27 crore       |
| Shortfall in generation due to reasons beyond control         | C       | 79.31 MU           |
| Shortfall in energy charges to be recovered during FY 2018-19 | D=C*B/A | <b>₹8.12 crore</b> |

(j) Under prevailing mechanism of Regulation 31(6)(b) of the 2014 Tariff Regulations, recovery on account of generation shortfall in FY 2016-17 is to be recovered during FY 2018-19 by way of modified ECR based on modified Design Energy for FY 2018-19.

(k) The present claim is based on tariff order of the Commission dated 17.06.2015 in Petition No.235/GT/2014 for FY 2016-17. However, subsequent to issuance of trued-up tariff for the FY 2016-17, the Petitioner may be allowed to raise supplementary bill on the basis of revised energy charges.



(l) CEA/CWC were requested to certify the actual inflow data in other similar petitions but they have shown inability to certify. Copy of letter is attached in instant petition.

6. The matter was heard on 02.05.2019. The Commission after hearing the parties, directed the Petitioner to submit the following additional information:

- “a. Rainfall data reported by IMD for the district in which plant is located and other adjoining districts to correlate low inflows; and*
- b. Planned/ forced machine outage data certified by CEA/NRLDC and its correlation with generation data viz a viz available average inflows during the period of such outages.”*

7. The Petitioner vide affidavit dated 10.6.2019 has submitted the following information, as directed:

- “a. IMD Rainfall data*
- b. Planned/forced machine outage data certified by CEA/NRLDC*
- c. Correlation of outage data with energy generation data vis-à-vis available average inflows”*

8. The Petitioner vide affidavit dated 7.10.2019 in compliance to the direction of the Commission vide ROP of the hearing dated 30.9.2019 has also amended the petition and has submitted as under:

- “3. That the amendments made in the main petition are detailed as under:-*
  - a. That the entire original petition is hereby renumbered. In place of Roman I, II,..numerical 1, 2, ..are mentioned. The inner paragraph of the main paragraph are also now numbered as a, b, etc. Prayers are renumbered as a, b, c etc.*
  - b. That Para XI of the original Petition is being replaced hereby by following paragraph:-*
    - “11. Under prevailing mechanism of regulation 31(6)(b), recovery on account of generation shortfall in FY 2016-17 is to be recovered during FY 2018-19 by way of modified ECR based on modified Design Energy (for FY 2018-19). Hon’ble Commission is requested to allow the recovery on account of generation shortfall by way of modified ECR based on modified Design Energy as per regulation 31(6)(b).”*
  - c. Prayer 1 of the original Petition is being replaced by the following prayer “a”:-*
    - “a. Hon’ble Commission may kindly allow recovery of energy charges amounting to ₹8.12 crore against the shortfall in generation of 79.31 MU beyond the control of Petitioner as per regulation 31(6)(b) of CERC Tariff Regulations, 2014”*
  - d. Prayer 2 of the original Petition is being replaced by the following prayer “b”:-*
    - “b. To allow issuance of supplementary bills for recovery of shortfall in energy charges amounting to ₹8.12 crore as per regulation 31(6)(b) of CERC Tariff Regulations, 2014.”*



9. The matter was heard again on 18.06.2020. The Commission after hearing the parties, directed the Petitioner to submit the following information:

- a. *Design Energy calculation (in MS Excel) as approved by CEA;*
- b. *Analysis of Annexure-II of the Petition on daily basis in MS Excel;*
- c. *Methodology for calculating daily maximum possible generation ,claimed in the Petition (in MS Excel);*
- d. *Daily generation report for the days for which energy shortfall has been claimed due to planned/forced outages, , high trash, plant shutdown due to strike and transmission constraints, etc.*
- e. *Day-wise details of scheduled energy, actual energy injected in the grid and energy accounted for in DSM along with the revenue earned from DSM for such energy; and*
- f. *As per the daily generation analysis submitted by the Petitioner, during high inflow periods, overload capacity of 10% has not been used to its fullest i.e. unit loading is always less than 110% for some Generating Stations inspite of water availability. Explain the reasons station-wise in this regard; and*
- g. *Any other relevant information/document to justify the claims in the Petition.”*

10. In compliance with the above directions, the Petitioner has submitted the additional information vide affidavit dated 16.7.2020.

### **Reply of BRPL, Respondent No.3**

11. BRPL vide its affidavits dated 30.4.2019 and 16.6.2020, has submitted as under:

- (a) The Petitioner has stated that the shortfall of 79.31 MU during the FY 2016-17 was beyond the control of the Petitioner and this alleged shortfall in monetary terms is ₹ 8.12 crores and it is claiming the recovery under Regulation 31(6)(b) of the 2014 Tariff Regulations 2014. However, the provisions of Regulation 31(6) of the 2014 Tariff Regulations do not provide for recoupment of under-recovered energy charges due to shortfall in energy generation for reasons beyond the control of Generating Station. The Petitioner has also not identified any other regulatory provision under which such a claim can be sought from the beneficiaries. The perusal of the above regulation would show that the above regulation provides for the treatment in case actual total energy generated by a hydro generating station during a year is less than the Design Energy.





(b) Similarly, the other consequential prayer related to revision of energy bills for the period 2016-17 and allowing issuance of the energy bill are also unfounded and without any basis.

(c) Perusal of the letter from the Central Water Commission would show that it is not be possible to certify the inflow series. Thus, the daily inflow series data submitted by the Petitioner has not been certified by the Central Water Commission.

(d) Annexure-II of the petition relates to the analysis on daily basis for the FY 2016-17 in respect of the Generating Station, but the data has not been vetted by any independent authority. This data would show that there was shortfall in all the months of FY 2016-17 except in the months of February 2017 and March 2017 which is of the order of 79.31 MU and there are no detailed explanation whether this shortfall is owing to planned or forced shutdown of the machinery and consequent reduced schedule or the same is attributable to low generation, as the Petitioner did not allow extra generation by depleting reservoir level which is expected to fill during the monsoon season. The main shortfall indicated by the Petitioner is during the months of April 2016 to August 2016 which is of the order of 119.01 MU. Perusal of Annexure-II related to the analysis on daily basis would show that during April 2016 to August 2016, the Petitioner could not even generate power commensurate with the actual inflows on daily basis and gave one excuse or the other for the low generation. Even during the months of July 2016 and August 2016 when there was huge spillage, the Petitioner could not take advantage of the situation and these resulted into energy shortfall of the order of 53.29 MU. All these figures very clearly indicate that the Petitioner was unable to optimize the reservoir capacity, keeping in view the monsoon forecast in the catchment areas of the Generating Station. There is a practice of undertaking maintenance work before the monsoon on all the units of the Generating Station so that they are ready for maximum generation during the monsoon season. Nothing has been explained on these issues in this petition and even the maximum reservoir level and minimum draw down level along with the daily reservoir levels have not been furnished. All this



would clearly show that the shortfall in energy generation was for reasons attributable to the Petitioner.

(e) Besides certification of the inflow series, the Petitioner is also required to produce certification from NRPC and NRLDC that the shortfall as claimed is not due to factors which are within the control of the Petitioner. However, neither NRPC nor NRLDC have even been included as Respondents in the petition.

(f) The Generating Station had generated an excess of 22 MU beyond scheduled energy (which includes free energy). The Petitioner would have sold this energy in the market resulting in revenue of approximately Rs 6 crore to the Generating Station, as shown in the computation below:

|   |                       |        |
|---|-----------------------|--------|
| MU Generated as per Petition                        | A                     | 669.2  |
| Normative Auxiliary Consumption                     | B                     | 1.00%  |
| MU Generated Net of Auxiliary Consumption           | $C = A * (100\% - B)$ | 662.51 |
| MU Scheduled by Station                             | D                     | 640.96 |
| Un-Scheduled (MU) by Station                        | $E = C - D$           | 22     |
| IEX prices of Northern Region for FY 15-16          | F                     | 2.58   |
| Amount Recovered for Un-scheduled energy (Rs crore) | $G = E * F / 10$      | 6      |

Therefore, the Petitioner has already recovered the amount which it is claiming as a loss due to shortfall of energy generation.

(g) The declaration of schedule for the next day is entirely within the domain of the Inter-state Generating Station (ISGS). As per Regulation 6.4(16) of the Grid Code, ISGSs are required to make advance declaration of ex-power plant MW and MWH capabilities for the next day i.e. 00.00 hrs to 24.00 hrs in 96 blocks each of 15 minutes duration. It is also incumbent on ISGSs to declare the plant capabilities faithfully, i.e. according to their best assessment as per Regulation 6.4(18) of the Grid Code. It is not permitted for ISGS to over/ under declare its plant capability faithfully and thus make money either as undue capacity charge or the charge for deviations.



(h) The Petitioner has deliberately declared low schedule to the tune of 28.22 (669.20-640.98) MU and accordingly has earned huge benefits in the form of UI charges on account of this unscheduled generation. UI charges vary from ₹ 1.99 per unit to ₹ 8.24 per unit for frequency deviation range from 50 Hz to 49.70 Hz respectively as per provisions of the CERC (Deviation Settlement Mechanism and related matters) Regulations, 2014 (hereinafter referred to as “the 2014 DSM Regulations”). This huge benefit may be viewed with reference to the Energy Charge Rate of ₹ 0.984 per unit in case of the Generating Station. It is, thus, evident that the Petitioner is earning benefits by declaring low schedule consistently. Details are provided in following table:

(Generation in MU)

| S. No. | Months         | Scheduled Ex-bus Generation | Actual Ex-bus Generation | % Deviation |
|--------|----------------|-----------------------------|--------------------------|-------------|
| 1.     | April-2016     | 78.77                       | 82.56                    | 4.81        |
| 2.     | May-2016       | 76.81                       | 79.39                    | 3.36        |
| 3.     | June-2016      | 65.95                       | 68.98                    | 4.59        |
| 4.     | July-2016      | 71.72                       | 73.93                    | 3.08        |
| 5.     | August-2016    | 94.62                       | 97.10                    | 2.62        |
| 6.     | September-2016 | 57.55                       | 59.80                    | 3.91        |
| 7.     | October-2016   | 28.48                       | 30.33                    | 6.50        |
| 8.     | November-2016  | 17.02                       | 18.15                    | 6.64        |
| 9.     | December-2016  | 13.68                       | 14.79                    | 8.11        |
| 10.    | January-2017   | 21.23                       | 23.15                    | 9.04        |
| 11.    | February-2017  | 50.88                       | 53.29                    | 4.74        |
| 12.    | March-2017     | 64.27                       | 67.74                    | 5.40        |
|        | Total          | 640.98                      | 669.20                   | 4.41        |

(i) The Petitioner is liable for ‘Gaming’ under Regulation 2(1)(i) of the 2014 DSM Regulations. It is also submitted that the beneficiaries could have availed power at ECR and not under the charges for deviations for unscheduled injection of 28.22 MU and accordingly the Petitioner got undue benefit at the cost its beneficiaries, rendering itself liable for action under Regulation 6 of the 2014 DSM Regulations.

(j) Power to remove difficulty can be exercised to the extent it is necessary for applying or giving effect to the legislation and in doing so, the authority exercising the power to remove difficulty may slightly tinker with the legislation to round off angularities, or smoothen joints or remove minor obscurities to make it workable, without doing violence to the basic structure and primary



features of the regulations. Further, under the guise of removing difficulties, the scheme and essential provisions of the legislations cannot be changed. Accordingly, the request of the Petitioner seeking relaxation under Regulations 54 and 55 of the 2014 Tariff Regulations, should be limited to parameters laid down by the Hon'ble Supreme Court.

### **Rejoinder of the Petitioner to the reply of BRPL**

12. In response to the reply of Respondent, BRPL, the Petitioner vide its affidavits dated 10.6.2019 and 4.7.2020 has filed its rejoinder and submitted as under:

(a) The recovery of 50% of AFC is entirely dependent upon generation up to Design Energy and in case of shortfall in generation, generating company is bound to lose revenue. In case of the Generating Station, in FY 2016-17, the total shortfall in generation was of 110.08 MU and loss of energy charges was of Rs 11.27 crore. In order to safeguard the interest of generating company, the Commission has allowed recovery of shortfall under Regulation 31(6) of the 2014 Tariff Regulations.

(b) The Respondent BRPL has commented on operational conditions of the project causing loss in Design Energy. The necessary clarification is as under:

- i. There is excess generation in the months of February 2016 and March 2016 due to excess inflow from Design Energy.
- ii. The reasons for shortfall in generation in the month of April 2016 to August 2016 has already been explained in instant petition.
- iii. In case, given discharge is beyond reservoir capacity, the spillage of water is bound to be and a generating company has no control over it.

(c) As per allocation letter issued by the Ministry of Power, full power is allotted to different beneficiaries of the Generating Station except 12% free power to the home state. In view of above, the Generating Station has no free power to be sold under market/ exchange for recovery of additional revenue.



The indicated generation (ex-bus) of 22 MU is unscheduled energy generated as per grid requirement under provisions of the 2014 DSM Regulations.

(d) Northern Regional power Committee (NRPC) and Northern Regional Load Despatch Centre (NRLDC) are the nodal agencies for regulation of power in the region. They are not supposed to certify the data related to loss of generation. As the above agencies have no share allocation from the Generating Station and as per definition in the 2014 Tariff Regulations, they are not beneficiaries of the Generating Station and hence, not made Respondent in the subject petition.

(e) Spillage of water and shortfall in generation may occur in any financial year when the discharge is not in line with hydrology considered in Design Energy.

(f) In case of heavy rain in a short span of time, the spillage of water cannot be stopped due to limited capacity of reservoir, whereas deficient discharge in other times will cause loss of design generation.

(g) Respondent BRPL has tried to link the provisions of Regulations 6.4(16) and 6.4(18) of the Grid Code and provisions of Regulation 31(6) of the 2014 Tariff Regulations. The present petition of the Petitioner is under Regulation 31(6) of the 2014 Tariff Regulations. Whenever the actual total energy generated during a year is less than the Design Energy for reasons beyond the control of the Generating Station, the Petitioner is entitled for the claim of shortfall in energy beyond its control.

(h) Respondent BRPL has compared the month-wise scheduled ex-bus generation of the Generating Station with actual ex-bus generation and has calculated deviation as percentage of scheduled ex-bus generation. It can be observed from the table produced by BRPL that the total percentage deviation in FY 2016-17 in the Generating Station is 4.41% (28.22 MU).

(i) Respective RLDCs keep a close eye on the scheduling and if any ISGS is suspected of gaming, RLDC and the Commission can initiate action on the



said ISGS as per provisions of Regulation 6.4(18) the Grid Code and Regulation 6(3) of the 2014 DSM Regulations.

(j) In the table reproduced by BRPL, it has calculated the month-wise percentage deviation as percentage of scheduled generation without taking into consideration the operational aspects of a hydro generating station. The months in which the percentage of deviation is in the range of 8.11%-9.04% are months of lean season in which the scheduled generation is very low and any small deviation from scheduled generation will result in high percentage of deviation. Further, during lean period, a hydro generator only operates its machine during peaking hours to support the grid and, therefore, the energy generated during the start of machine will ultimately result in deviation. This can be illustrated by a simple example:

*“Suppose during the month of November, the peaking hours is from 6 PM to 9 PM, due to less inflow in the lean season the generating station will operate its machines during the peaking hours only. Therefore, the schedule as declared by the generating station shall be from 6 PM to 9 PM, however to avoid any last minute delay the generating station normally synchronizes its machines with grid say upto one time block prior to the start of schedule. Therefore, any energy generated during the start of machine in the lean period will ultimately land up in deviation which is because of the inherent nature of hydro generating station and cannot be avoided.”*

(k) In view of regulatory provisions laid down in the Grid Code to keep gaming in check, the percentage deviation of 4.41% of scheduled generation and 4.22% of actual generation by no means can be called ‘Gaming’ as permitted limit is 12% of scheduled injection i.e., maximum upto 48 MW in case of plants with installed capacity upto 400 MW or 150 MW whichever is lower. Therefore, alleged charge of gaming by BRPL is baseless and is not backed by any evidence.

(l) Respondent, BRPL has contested that the provision of ECR is against the Section 61(d) of the Electricity Act, 2003 which provides for safeguarding of consumer’s interest, as they have to pay extra charges for the supply from hydro generating station. ECR calculated for recovery of energy charges is merely for recovery of 50% of AFC of the Generating Station and no extra charge is being paid by the consumer to the Generating Station.



(m) The instant petition is filed under Regulation 31(6) of the 2014 Tariff Regulations for recoupment of under-recovered energy charges due to shortfall in energy generation for reasons beyond the control of the Generating Station during the FY 2016-17 in respect of the Generating Station and no relief has been sought under Regulation 54 'Power to Relax' and Regulation 55 'Power to Remove Difficulty'. Therefore, the submission of BRPL is not relevant.

### **Reply of PSPCL, Respondent No.1**

13. The Respondent vide its affidavit dated 8.4.2019, has submitted as under:

(a) The Petitioner has claimed for recovery on account of shortfall in generation of 79.31 MU while stating that the same is on account of reasons which were beyond the control of the Petitioner. However, the Petitioner has not provided any details of the reasons which were beyond the control of the Petitioner.

(b) The actual inflow cannot always be the same as the design inflow. On some days, the actual inflow will be less while on some other days, it will be more than the design inflow. The Petitioner cannot possibly ask for recovery of energy charges on account of loss of generation every time the actual inflow is less than the designed inflow. As a hydro power generator, the Petitioner ought to be aware that the quantum of inflow is not constant. This is not an unforeseen event at all or an event beyond the control of the Petitioner. The Petitioner being in the business of generation of hydro power ought to have been aware of this. Therefore, the Petitioner has no basis for claiming relief by citing the loss of generation on account of less inflow.

(c) The Petitioner has stated that the energy loss due to silt flushing is an uncontrollable event and the loss of energy due to this is recoverable from the beneficiaries. As a hydro power generator, the Petitioner ought to have planned for such a situation. Silt flushing is a foreseeable event which keeps on happening with hydro power projects. Therefore, the same cannot be considered as being beyond the control of the Petitioner. The Petitioner being a



hydro power generator, should know how to make arrangements in such circumstances. The Petitioner ought not to be given any relief on account of silt flushing.

(d) Treatment under Regulation 31(6) of the 2014 Tariff Regulations can be applied only when the total energy generated is less than the Design Energy due to reasons beyond the control of the hydro generating station. The reasons furnished by the Petitioner cannot be said to be 'beyond the control of the Petitioner. The Petitioner could have made arrangements to deal with the aspect of silt flushing.

### **Rejoinder of the Petitioner to the reply of PSPCL**

14. In response to the Respondent PSPCL, the Petitioner vide its affidavit dated 3.6.2019 has filed its rejoinder and submitted as under:

(a) The reasons for shortfall in generation of 79.31 MU, which were beyond the control of the Petitioner has already been provided in this petition.

(b) The generation is affected by seasonal variations. However, if overall annual discharge is less than the expected discharge, the loss of generation is bound to be there. The Petitioner has lost 120.81 MU in some months due to less inflow, whereas 54.75 MU extra energy is generated in some other months due to higher inflow and overall loss of generation claimed in the petition on account of less inflow is 66.06 MU.

(c) Silt flushing is a seasonal requirement in hydro generating stations during monsoon season. Requirement of silt flushing depends on silt content in the water and it cannot be ascertained. Regarding less generation as compared to Design Energy, it is submitted that Design Energy is determined on the basis of discharge in 90% dependable year with 95% machine availability. The Design Energy is not linked directly with design of project structure for spillage or de-silting arrangement.





(d) The Generating Station is under commercial operations since 1982. Hence, the operation period is more than 10 years and recovery of shortfall in generation is as per Regulation 31(6)(b) of the 2014 Tariff Regulations. As per Regulation 31(6)(b) of the 2014 Tariff Regulations, the recovery on account of shortfall in FY 2016-17 is to be made by reducing the Design Energy of the Generating Station during third year i.e. FY 2018-19.

### **Analysis and Decision**

15. The Petitioner has submitted the actual average inflows measured at dam site for each day of FY 2016-17 based on which the shortfall has been claimed. Further, based on the following formulae along with certain adjustments, the Petitioner has submitted that it has calculated the daily maximum possible generation for 365 days based on actual inflows:

Maximum Possible Generation during a day (MU) =  
(Average inflow for ith day) X (Maximum generation corresponding to installed capacity) / (Rated inflow for installed capacity)

Where,

the capacity of the Generating Station is 180 MW and the corresponding rated inflow is 88 cumecs; and the sum of daily maximum possible generations for 365 days as submitted by the Petitioner is 709.20 MU.

16. To cross check the correctness of maximum possible generation of 709.20 MU, we have used the following formula (used by CEA while fixing the Design Energy of the station) for arriving at the power potential of actual inflows restricted to 180 MW and then at the daily Maximum possible energy generation in MU:

Maximum Possible Generation during a day (MU) =  $(240 \times 0.89 \times 9.8 / 1000) \times (24 / 1000) \times \text{Actual Inflow of the day available for generation}$

Where,



240 is the rated head of the plant (in meters) which is considered as per the Petitioner's submission in Petition No. 143/GT/2020, whereas factor 0.89 represents overall plant efficiency of 89% which is derived from 97.6% generator efficiency & 91.3% turbine efficiency, as submitted by the Petitioner in Petition No. 76/MP/2015 (R&M of the instant Generating Station) and  $9.8 \text{ m/s}^2$  is acceleration due to gravity.

17. Based on the above methodology, maximum possible energy generation for the year 2016-17 works out to 716.26 MU without considering overload capacity utilized by the Petitioner on certain days. Further, it is observed that on certain days (84 days), the actual generation is more than the theoretical power potential of inflows by 5.48 MU because of two reasons: i) high head availability in comparison to rated head during lean period as the tail race level is at its minimum and (ii) due to utilization of overload capacity to the extent declared by the petitioner during peak season. As such, for these days (84 days), maximum possible generation has been replaced with actual generation to arrive at the annual maximum possible generation. Accordingly, maximum possible generation based on the above works out to 721.74 MU ( $716.26+5.48$ ) against the maximum possible generation of 709.20 MU as calculated by the Petitioner. The difference of 12.54 MU represents 1.61% of the design energy i.e., 779.28 MU. As such, this difference is being considered as a loss attributable to the Petitioner and is adjusted from allowed shortfall in energy charges at paragraph 46 below. However, considering the fact that the Petitioner has mapped the energy shortfall with respect to maximum energy generation of 709.20 MU, the same is being considered for further deliberations.



18. Design Energy of the Generating Station is 779.28 MU. During the FY 2016-17, the Petitioner has claimed a shortfall of 79.31 MU out of total shortfall of 110.08 MU in generation, as the actual generation was 669.20 MU.

19. The Petitioner has divided the energy shortfall into two parts:

a) Shortfall of 30.77 MU which was for reasons which were under the control of the Petitioner. The break-up of the same is as under:

i) Energy generated by depleting reservoir level on some days: 12.05 MU

ii) Less generation for increasing reservoir level on some days: (-) 22.15 MU

iii) Unit Outage: (-) 0.95 MU

iv) Other constraints (partial load/ ramping up, down during peaking): (-) 19.73 MU

*\* Note sum of i) and ii) above i.e. (-) 10.1 MU is net shortfall in generation by managing reservoir level and sum of iii) and iv) i.e. (-) 20.68 MU is the loss for which the Petitioner is accountable.*

b) Shortfall of 79.31 MU which was for the reasons not under the control of the Petitioner. The breakup of the same is as under:

i) Energy shortfall due to less inflow: (-)120.81 MU

ii) Energy gain due to excess inflow: 54.75 MU

iii) Energy shortfall due to silt flushing: (-) 13.25 MU

*\* Note: the sum of i) and ii) i.e. (-) 66.06 MU represents the short fall due to low inflows in comparison to the design inflows associated with design year.*

20. The Respondent, BRPL has submitted that the Petitioner has not been able to utilise the full potential of the inflows, especially during April 2016 to August 2016 as there was lot of spillage as observed from the 365 days data as submitted by the Petitioner. In our view, this proposition is not correct since the capacity of the reservoir is limited and as per technical parameters, whenever the inflows are more than the design discharge, spillage is bound to occur. The full potential of the



incoming flows subject to limitation of the reservoir capacity, need to be utilized by the Generating Station without spillage. From the scrutiny of the 365 days' data as submitted by the Petitioner, we observe that on most of the days, spillage has occurred only when the inflows are more than the design discharge. It is also observed that during instances of spillage, when their generation is affected by other constraints also, the Petitioner has booked the loss in generation due to these outages under its control and has not claimed the energy generation for these outages. Therefore, we do not agree to the contention of the Respondent BRPL that the Petitioner has not been able to utilize the full potential of the inflows and that the Petitioner has allowed water to spill over.

21. Some of the Respondents have submitted that the data submitted by the Petitioner has not been verified by any independent agency. Therefore, we have carried out further analysis in the following paragraphs to ascertain reasonability of the claim of the Petitioner which also includes whether the Petitioner has been able to utilize the full potential of actual inflows.

22. With regard to the claim of the Petitioner that energy shortfall to the extent claimed for the year 2016-17 was due to uncontrollable factors, the Commission is of the view that low generation in comparison to Design Energy in a hydro Generating Station can be attributable to the following reasons:

- (i) Low inflows in comparison to the design inflows associated with design year.
- (ii) Prolonged planned/ forced outage of machines.
- (iii) Inefficient operation of the plant (which may include low overall efficiency of turbine and generator, high auxiliary power consumption, high losses in water conductor system etc.).



(iv) Non-utilization of maximum power potential of actual inflows due to excessive spillage.

We analyse each of the above reasons in respect of the present claim of the Petitioner in the following paragraphs.

(i) Low inflows in comparison to the design inflows associated with design year

23. The Commission vide ROP (Record of Proceedings) of hearing dated 02.05.2019, directed the Petitioner to submit IMD (India Meteorological Department) rainfall data to correlate low inflows. The Petitioner was directed to get the inflow data verified from CEA/ CWC. With regard to the certification of the inflow data by CEA/ CWC, the Petitioner has enclosed a letter from CWC dated 23.01.2017 where CWC had categorically mentioned its inability to certify the inflow data in respect of the Generating Station of the Petitioner. As such, in absence of certified data by CEA/CWC, we have relied upon the analysis of IMD data and data related to outages (planned or forced) to assess whether low inflows was one of the major reasons for low generation in comparison to Design Energy.

24. The rainfall data issued by the IMD in respect of Chamba district for the years 2016 and 2017 is given below:

(Rainfall in mm)

| Year | Jan   | Feb  | Mar   | Apr   | May  | Jun   | Jul   | Aug   | Sep  | Oct | Nov | Dec |
|------|-------|------|-------|-------|------|-------|-------|-------|------|-----|-----|-----|
| 2016 | 22.7  | 58.9 | 223.7 | 55.6  | 88.8 | 83.6  | 209.5 | 274.7 | 34.8 | 8.5 | 0   | 0.9 |
| 2017 | 187.9 | 88.3 | 76.1  | 105.2 | 75.7 | 130.7 | 277.9 | 196.8 | 90.2 | 0   | 2.3 | 69  |

**Note:** The district rainfall in millimetres (R/F) shown above are the arithmetic averages of rainfall of stations under the district.

**% Departure from Long Period Averages**

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct  | Nov  | Dec |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----|
| 2016 | -82 | -48 | 86  | 9   | 66  | -37 | -63 | -43 | -85 | -83  | -100 | -98 |
| 2017 | 49  | -22 | -37 | 106 | 42  | -1  | -51 | -59 | -60 | -100 | -89  | 23  |

**Note:** % Departures are the departures of rainfall from the long period averages of rainfall for the district.



25. As per India Meteorological Department (IMD), which is the central agency that records and archives rainfall data in India:

*When the rainfall for the monsoon season of June to September for the country as a whole is within 10% of its long period average, it is categorized as a "Normal" monsoon. It is categorized as "Excess" monsoon, if it is above 110 % of long period average and "Deficient", if it is below 90% of long period average. The performance of monsoon rainfall over smaller areas of the country is monitored by evaluating the departures from the normal for each meteorological sub-division and district. The rainfall is classified as excess, normal deficient or scanty as per the following criteria. Excess +20% of normal or more, 'Normal: + 19% to -19% of normal, Deficient -20% to -59% of normal, Scanty: -60 % of normal or less*

*The 'monthly normal' rainfall of a station was calculated using all the available data during the period 1941-1990. (In the Statistical Abstract, India 2004 this period was 1901-1970). (The monthly "normal rainfall" of the sub-division is the mean of monthly normal rainfall of the corresponding stations and "annual normal rainfall " is the sum of the monthly normal rainfall for all the 12 months.*

26. The above tabulated rainfall data as per IMD reports, indicates low rainfall in comparison to long period averages in Chamba district for 2016 and 2017. Accordingly, theoretical energy shortfall of 70.08 MU between the maximum possible generation (709.20 MU) and Design Energy (779.28 MU) represents the shortfall due to less inflows and the same was beyond the control of the Petitioner. However, it is observed from the daily generation analysis submitted by the Petitioner, vide affidavit dated 16.7.2020, that there are 33 instances where the shortfall of 4.02 MU has occurred due to less inflows, and the same is not claimed by the Petitioner in the instant petition. As such, out of theoretical energy shortfall of 70.08 MU, the Petitioner has claimed net shortfall of 66.06 MU due to less inflows under the head "reasons not under the control of the Petitioner" and thus, we hold the view that the same was beyond the control of the Petitioner.

*(ii) Prolonged forced/ planned outage of machines*

27. In order to rule out the prolonged planned/ forced outage of machines, their impact on energy generation and in order to understand whether outage of a machine in anyway affected the energy generation by non-utilization of available water flow, the



Commission vide ROP of the hearing dated 2.5.2019 directed the Petitioner to furnish the planned and forced outage data 2016-17 along with its correlation with energy generation. In response, the Petitioner vide affidavit dated 16.7.2020 has submitted that there have been 100 instances of forced and planned outages during 2016-2017. We note that out of these 100 outages, 24 incidences of forced outages were due to reasons such as abnormal sound in underwater parts, silt flushing, inspection of lines, stator inter turn fault, generator protection relay operated, formation of acetylene gas in GT, generator circuit breaker problem, protection relay operated, feeder tripping, over-frequency etc. as reported by the Petitioner. It is noticed that there are 51 instances pertaining to the months of November 2016, December 2016 and January-February 2017 during which the plant was under planned shutdown for carrying annual maintenance. It is further noticed that, there are 25 instances of planned outage other than annual maintenance for reasons such as, inspection of underwater parts, abnormal sound in underwater parts, calibration purposes, high silt/ silt flushing, distance protection relay operated and over-voltage relay operated, capital maintenance etc. In order to estimate energy shortfall due to forced outages and planned outages, calculations have been made. Based on these calculations, the results in respect to the 100 cases of forced/ planned outages, are summarized as under:



| Events (a)  | Design Energy (MU) (b) | Spillage (Cumecs) (c) | Maximum possible generation based on Installed Capacity of 180 MW, actual inflow available & overload margins wherever used without considering excess generation due to reservoir adjustment (MU) (d) | Actual Generation at GT (MU) (e) | Energy shortfall (MU) (f) = (e)-(b) | Claimed under the head:- Shortfall Beyond control of Generating Station (g) = (d)-(b)+ loss due to high silt | Claimed under the head:- Shortfall Within control of Generating Station (h)=(e)-(d)-loss due to high silt | Observation   |
|---|------------------------|-----------------------|--|----------------------------------|-------------------------------------|--|---|---|
| 51<br>(Planned outages during Annual Maintenance)     | 39.41                  | 2.96                  | 34.57  | 36.18                            | (-)3.23                             | (-)4.83  | 1.60  | (-)4.83 MU claimed by the Petitioner for reason of less inflow from design inflow and 1.60 MU excess in energy generation due to reasons like increasing/ decreasing of reservoir level, etc., accounted under the head 'within control of the Petitioner' and has not been claimed by the Petitioner.      |
| 25<br>(Planned outages other than Annual Maintenance) | 35.10                  | 39.69                 | 25.73  | 25.23                            | (-)9.84                             | (-)9.35  | 0.77  | (-)9.35 MU claimed by the Petitioner for reason of less inflow from design inflow and 0.77 MU excess in energy generation due to reasons like increasing/ decreasing of reservoir level, etc., Accounted under the head 'within control of the Petitioner' and has not been claimed by the Petitioner.      |
|   |                        |                       |  |                                  |                                     | (-)1.27  |   | Shortfall of (-) 1.27 MU due to high silt / silt flushing accounted under the head beyond the control of the Petitioner' and has been claimed by the Petitioner.  |
| 24<br>(Forced/ Machine outages)                       | 49.00                  | 725.86                | 61.12  | 48.54                            | (-)0.43                             | 12.15  | (-)0.59   | 12.15 MU of additional generation due to excess inflow from design inflow has been adjusted in the shortfall claimed and (-) 0.59 MU shortfall in energy generation due to various reasons such as unit outages, other constraint, increasing/ decreasing of reservoir level, etc. accounted under the head |





|                           |              |               |               |               |              |               |             |   |
|---------------------------|--------------|---------------|---------------|---------------|--------------|---------------|-------------|---|
|                           |              |               |               |               |              |               |             | 'within control of the Petitioner' and has not been claimed by the Petitioner.  |
|                           |              |               |               |               |              | (-)11.98      |             | Shortfall of (-) 11.98 MU due to high silt / silt flushing accounted under the head beyond the control of the Petitioner' and has been claimed by the Petitioner. |
| <b>Total Events : 100</b> | <b>123.5</b> | <b>768.51</b> | <b>121.42</b> | <b>109.95</b> | <b>-13.5</b> | <b>-15.28</b> | <b>1.78</b> |   |

28. From the above data, we note that out of 100 outages as reported by the Petitioner, during 51 instances when the plant was under planned shutdown for carrying Annual Maintenance of various units during lean inflow period, the maximum possible generation from available inflows was 34.57 MU as against Design Energy of 39.41 MU and the actual generation was 36.18 MU. The shortfall of 4.83 MU during these 51 instances was solely attributable to less inflows which was not under the control of the Petitioner and same is included in the shortfall of 120.81 MU claimed by the Petitioner due to less inflows as indicated at paragraph 5(d) above. It is noticed that the Petitioner was able to generate 36.18 MU against maximum possible potential of 34.57 MU, and has accounted excess generation 1.60 MU in energy generation due to reasons, increasing/ decreasing of reservoir level, etc. and the same has been accounted by the Petitioner under the head 'within control of the Generating Station'. As such, it is noticed that the planned outage of machines during the lean months had not affected the energy generation.

29. Further, it is noticed that there is one day out of above 51 events, when spillage has occurred. After scrutiny of the outage data submitted by the Petitioner, it is observed that on this day, the Petitioner has achieved the maximum possible generation and there is no shortfall on the day. As such, the Petitioner cannot be



faulted for the excessive spillage or non-utilization of full potential of actual inflows due to inefficient operation or due to planned outages.

30. For the 25 instances during which the plant was under planned shutdown due to various reasons such as inspection of underwater parts, abnormal sound in underwater parts, calibration purposes, high silt/ reservoir flushing, distance protection relay operated and over-voltage relay operated, capital maintenance etc., there was total energy generation shortfall of 9.84 MU. It is noticed in this net shortfall of 9.84 MU that there is shortfall of 9.35 MU during this period that is solely attributable to less inflows (which was not under the control of the Petitioner). The same is included in the shortfall of 120.81 MU claimed by the Petitioner due less inflows as indicated at paragraph 5(d) above. Additional net generation of 0.77 MU is due to various reasons such as unit outages, increasing/ decreasing of reservoir level etc. and the same has been accounted by the Petitioner under the head 'within control of the Generating Station'. Shortfall of 1.27 MU due to high silt/ reservoir flushing has been accounted for by the Petitioner under the head 'beyond the control of the Generating Station', which is included in total energy shortfall of 13.25 MU due to silt flushing.

31. Further, it is noticed that there was one day out of above 25 events, when spillage has occurred. After scrutiny of the outage data submitted by the Petitioner, it is observed that the spillage was due to combined effect of inflows being more than the design discharge and high silt/ reservoir flushing. It is observed that corresponding shortfall in energy generation due to such unit outages, when spillage has occurred during the event is not attributable to the Petitioner. As such, the Petitioner cannot be faulted with the excessive spillage or non-utilization of full potential of actual inflows due to inefficient operation or due to forced Outages.



32. For the 24 instances of forced/ machine outages, there was total energy generation shortfall of 0.43 MU. It is noticed that in this net shortfall of 0.43 MU, there is additional generation of 12.15 MU due to excess inflow from design inflow during this period, which has been adjusted in the shortfall of 120.81 MU claimed by the Petitioner due to low inflows in comparison to the design inflows. Also, there is 0.59 MU shortfall in energy generation due to various reasons such as unit outages, other constraint, increasing/ decreasing of reservoir level, etc. and the same has been accounted by the Petitioner under the head 'within control of the Generating Station' and has not been claimed as shortfall to be recovered. Further, the shortfall of 11.98 MU due to high silt/ silt flushing has been accounted for by the Petitioner under the head 'beyond the control of the Generating Station', which is included in total energy shortfall of 13.25 MU due to silt flushing.

33. It is noticed that there were 8 days out of above 24 events, when spillage has occurred. After scrutiny of the outage data submitted by the Petitioner, it is observed that these days when spillage has occurred are the days when the inflows were more than the design discharge of 80 cusecs. As such, the Petitioner cannot be faulted with the excessive spillage or non-utilization of full potential of actual inflows due to inefficient operation or due to forced outages except for the loss of 0.59 MU due to various reasons such as unit outages, other constraints, increasing/ decreasing of reservoir level, etc., for which the Petitioner has taken the responsibility by putting them under the list of reason for shortfall 'within control of the Generating Station'.

34. As regards shortfall due to high silt/ silt flushing that has been accounted by the Petitioner under the head 'beyond the control of the Generating Station', the Respondent PSPCL has submitted that silt flushing is a foreseeable event and that



the Petitioner ought to have planned for such a situation as a hydro power generator and should know how to make arrangements in such circumstances. In response, the Petitioner has submitted that silt flushing is a seasonal requirement in hydro generating stations during monsoon season. Requirement of silt flushing depends on silt content in the water and it cannot be ascertained. As regards shortfall in generation with respect to Design energy, the Petitioner has submitted that the Design Energy is determined on the basis of discharge in 90% dependable year with 95% machine availability and the Design Energy is not linked directly with design of project structure for spillage or de-silting arrangement. Stoppage of plant due to high silt/ silt flushing results in loss of energy and is beyond the control of the generator.

35. In our view, considering the fact that the calculation of Design Energy of the plant based on the hydrological series does not take into account the energy lost due to stoppage of plant on account of high silt/ silt flushing, the generator needs to be compensated for that.

36. In view of the above deliberations, it is held that these 100 outages had impacted the energy generation to the extent of (-) 13.5 MU out of which loss of 15.28 MU was for the reasons (silt and low inflows) which were beyond the control of the Petitioner and for balance additional generation of 1.78 MU (including less generation due to unit outage, other constraint and due to increasing reservoir level), the Petitioner has taken the responsibility by putting them under the list of reasons within its control.

(iii) & (iv) Inefficient operation of the plant & non-utilization of maximum power potential of actual inflows due to excessive spillage



37. To assess maximum possible annual generation with available actual inflows after accounting for the generation loss for the reasons which were beyond the control of the Petitioner and which are attributable to the Petitioner, the possible generation at generator terminal has been assessed as under, against the actual generation of 669.20 MU:

(a) Possible generation assessed at generator terminal after accounting for the generation loss due to reasons beyond the control of the Petitioner as discussed above:

|    |   |             |
|----|---|-------------|
| 1. | Design Energy of the instant Generating Station                                       | 779.28 MU   |
| 2. | Energy shortfall due to less inflows (on net basis)                                   | (-)66.06 MU |
| 3. | Energy loss due to silt flushing  | (-)13.25 MU |
| 4. | Energy that could have been generated by utilizing available actual inflows (4=1+2+3) | 699.97 MU   |

(b) Possible energy generation at generator terminal after accounting for the reasons within the control of the Petitioner as considered by the Commission:

|    |   |  |
|----|---|--|
|    |   | Based on actual available flow at 100% machine capacity  |
| 1. | Remaining Energy that could be generated after taking into account reasons beyond control | 699.97 MU  |
| 2. | Generation due to reasons within the control of Petitioner (on net basis)                 | (-)30.77 MU<br>{(-)10.10 MU by managing the reservoir level, (-)0.95 MU due to unit outages and (-)19.73 MU due to other constraints etc.} |
| 3. | Remaining Energy that could be generated (3=1+2)  | 669.20 MU  |

38. In view of the above calculations and the fact that actual generation of the Generating Station i.e. 669.20 MU is in agreement with the theoretical calculations (669.20), it is held that the Petitioner has been able to generate according to the actual inflows after accounting for the reasons under its control and reasons beyond its control. Accordingly, the Petitioner cannot be faulted with inefficient operation of the



plant and non-utilization of maximum power potential of actual inflows (except to the extent of 12.54 MU as deliberated at paragraph 17 above for which the adjustment has been made at paragraph 46) or excessive spillage, .

39. Based on the above deliberations, the following table sums up the total energy shortfall, energy shortfall for the reasons beyond the control of the Petitioner and energy shortfall for reasons within the control of the Petitioner:

| Sl.No.  | Description   | (MU)  |
|---|---|---|
| 1.  | <b>Design Energy</b>                                  | <b>779.28</b>                                       |
| 2. Energy short fall for reasons beyond the control of the Petitioner |   |   |
| 2.1.  | Energy loss due to silt flushing                      | (-)13.25  |
| 2.2   | Energy loss due to less inflows (on net basis)        | (-)66.06  |
| 3.  | Sub-total   | <b>(-)79.31</b>                                     |
| 4.  | Energy shortfall within the control of the Petitioner | <b>(-)30.77</b><br>{(-)10.10, (-)0.95,<br>(-)19.73} |
| 5.  | Total energy shortfall (3)+(4)                        | <b>(-)110.08</b>                                    |

40. The Petitioner has submitted the following position with respect to under-recovery of energy charges:

| Schedule*<br>Energy (Ex-<br>Bus) (MU) | Free*<br>Energy<br>(MU) | Net Energy<br>Billed (MU) | ECR<br>(₹/Unit) | Allowed<br>Energy<br>Charges<br>(crore) | Energy<br>Charges<br>actually<br>recovered<br>(crore) | Under-<br>recovery<br>of Energy<br>Charges<br>(crore) |
|---------------------------------------|-------------------------|---------------------------|-----------------|---|---|---|
| 1                                     | 2                       | 3=1-2                     | 4               | 5                                       | 6=3x4   | 7=5-6   |
| 640.96                                | 76.91                   | 564.05                    | 0.984           | 66.77                                   | 55.50   | 11.27   |

41. Respondent BRPL has submitted that the Generating Station had an excess of 22 MU beyond scheduled energy and the Petitioner would have sold this energy in the market resulting in revenue to the Generating Station (approximately ₹ 6 crore). In this regard, NHPC has stated that as per allocation letter issued by MoP, full power is allotted to different beneficiaries of the Generating station (except for free power to Home State). As such, the instant generating station has no free power to be sold in



power exchange for recovery of additional revenue. In our view, the stated excess energy of 22 MU (beyond scheduled energy) being sold in market may not be a correct proposition as power whether sold to beneficiaries or in the market (even if permissible) is accounted for in scheduled energy and the power in excess of scheduled energy is energy reflected under DSM mechanism.

42. Further, Respondent BRPL in its additional reply dated 16.6.2020 has submitted that the generating station had an excess generation of 28.22 MU beyond scheduled energy and accordingly earned huge benefits on this unscheduled generation from the beneficiaries of Northern Region in the form of UI charges which vary from ₹ 1.99 per unit to ₹ 8.24 per unit for frequency deviation range from 50 Hz to 49.70 Hz respectively as per the 2014 DSM Regulations.

43. The Commission vide ROP of the hearing dated 18.6.2020 directed the Petitioner to submit the details of energy accounted for in DSM. In response to ROP, the Petitioner has submitted the details of energy accounted for in DSM vide affidavit dated 16.7.2020. Payment for energy under DSM is governed by provisions of the 2014 DSM Regulations. It has been submitted that 21.49 MU is the energy which has been accounted for in DSM and corresponding revenue earned from DSM is ₹514.51 lakh. In a similar case, vide order dated 10.02.2021 in Petition No. 330/MP/2018, the Commission held as under:

*“45. ----- Regulation 31(6)(a) of the 2014 Tariff Regulations provides for recovery of energy charge shortfall corresponding to the energy which could not be generated for the reasons beyond the control of the Petitioner. There is no doubt that the energy accounted for in DSM is actual energy generated and also that the Petitioner has received payment for the same in terms of provisions of the 2014 DSM Regulations. Therefore, the energy that has been accounted for in DSM cannot be counted towards shortfall in energy in terms of Regulation 31(6)(a) of the 2014 Regulations and, therefore, corresponding energy charge cannot be recovered in terms of that regulation. Thus, revenue generated by the Petitioner under DSM needs to be*



appropriately accounted for while deciding the quantum of shortfall under provisions of Regulation 31(6)(a) of the 2014 Tariff Regulations.

46. We are also conscious of the fact that generating stations are required to provide support to the grid and for that purpose, payments for energy supplied is accounted for under provisions of the 2014 DSM Regulations. Also, often the support to the grid is through governor mode operation and is beyond control of the Petitioner. Therefore, in case the revenue received under provisions of the 2014 DSM Regulations is less than the energy that would have been received had the same been supplied to the beneficiaries, the generator should not be adversely affected. Thus, with a view to balance the interest of the generator as well as the beneficiaries, it would be prudent to calculate the energy charge shortfall after adjustment of the amount which is lower of:

- a) the actual revenue earned by the generating station through DSM in the financial year (for which shortfall is claimed) and
- b) the amount that would have been paid by the beneficiaries had the same energy been scheduled.”

44. The above order is applicable in the present case also. In the instant case, the Petitioner has been able to generate revenue to the tune of ₹ 514.51 lakh for the energy accounted for in DSM i.e., 21.49 MU. On the other hand, if this energy would have been scheduled, the scheduled energy would have increased to 662.45 MU (640.96+21.49) and the energy charge shortfall of the Generating Station would have reduced in comparison to the claimed energy charge shortfall of ₹11.27 crore. The following table captures the reduction in energy charge shortfall after adding the energy accounted for in DSM, in the actually scheduled energy:

|   | Schedule Energy (Ex-Bus) (MU) | Free Energy (MU) | Net Energy Billed (MU) | ECR (₹/Unit) | Allowed Energy Charges (Rs. crore) | Energy Charges actually recovered (Rs. crore) | Energy Charge shortfall (Rs. crore) |
|---|-------------------------------|------------------|------------------------|--------------|------------------------------------|---|-------------------------------------|
|   | 1                             | 2                | 3=1-2                  | 4            | 5                                  | 6=3x4/10                                      | 7=5-6                               |
| As claimed by the Petitioner based on actually scheduled energy       | 640.96                        | 76.91            | 564.05                 | 0.984        | 66.77                              | 55.5  | 11.27                               |
| As modified by adding the DSM energy in the actually scheduled energy | 662.45<br>(640.96+21.49)      | 79.49            | 582.96                 | 0.984        | 66.77                              | 57.36   | 9.41                                |





45. From the above table, we conclude that the energy charges recoverable for the energy accounted for in DSM would have been ₹1.86 (57.36-55.5) crore as against ₹5.14 crore recovered by the Generating Station from the DSM pool.

46. As explained at paragraph 44, since the energy charge amount that would have been paid by the beneficiaries had the energy of 21.49 MU i.e., equal to the energy accounted for under DSM been scheduled to beneficiaries (i.e., ₹1.86 crore) is on lower side as compared to actual revenue earned from the DSM pool (₹5.14 crore), the actual energy charge shortfall of ₹11.27 crore is reduced by the lower of the two, which amounts to ₹9.41 crore (11.27-1.86). Accordingly, the energy charge allowed to be recovered in the FY 2018-19 due to shortfall in energy generation from the Design Energy during 2016-17 has been calculated as under:

| Sl. No. | Description  |           |                      |
|---------|--|-----------|----------------------|
| 1       | Total Shortfall in generation during FY 2016-17 (MU)   | A         | 110.08               |
| 2       | Total under-recovery of energy charges during FY 2016-17 (₹ crore)   | B         | 11.27                |
| 3       | Total under-recovery of energy charges during FY 2016-17 after accounting for the revenue which would have been earned if the energy accounted under DSM would have been scheduled to the beneficiaries (in ₹ crore) | C         | 9.41<br>(11.27-1.86) |
| 4       | Shortfall in generation due to reasons beyond control (MU)   | D         | 79.31                |
| 5       | Shortfall in energy charges to be recovered during FY 2018-19 (₹ crore)  | $E=D*C/A$ | 6.78                 |
| 6       | Adjustment in energy charge shortfall due to loss of 12.54 MU at generator terminal (paragraph 17)<br>$12.54 \times (1-.01) \times (1-0.12) \times 0.984 / 10$ (₹ crore)   | F         | 1.07                 |
| 7       | Total under-recovery energy charges after adjusting the unexplained energy loss of 12.54 MU (₹ crore)  | $G = E-F$ | 5.71                 |

47. Accordingly, in terms of Regulation 31(6) of the 2014 Tariff Regulations, the Design Energy for 2018-19 shall be modified to 531.61 MU (A1+A2-DE) considering



the actual generation (A1) of 669.20 MU during FY 2016-17, actual generation (A2) of 641.69 MU during FY 2017-18, and Design Energy (DE) of 779.28 MU, till the energy charge shortfall of ₹ 5.71 crore for FY 2016-17 is recovered by the Petitioner after revising the ECR. After recovery of the shortfall of ₹ 5.71 crore, the normal ECR for the year 2018-19 shall be applicable for the balance period. Further, the difference in energy charge shortfall to be recovered for the FY 2016-17 which may arise after true up of tariff for the period 2014-19 shall be recovered directly by the Generating Station from the beneficiaries through supplementary bills after true-up.

48. Petition No. 369/MP/2018 is disposed of in terms of above.

Sd/  
**(Arun Goyal)**  
**Member**

Sd/  
**(I S Jha)**  
**Member**

Sd/  
**(P. K. Pujari)**  
**Chairperson**

