

CENTRAL ELECTRICITY REGULATORY COMMISSION
4th Floor, Chanderlok Building, 36, Janpath, New Delhi- 110001
Ph.: 23753942 Fax-23753923

Ref: Petition No. 150/MP/2016

Date: 29.9.2017

To

1. The General Manager
SJVN Limited
Himfed Building, Below BCS
New Shimla, Shimla- 171009
2. The Member Secretary
Northern Regional Power Committee
18-A, Qutab Institutional Area
Shaheed Jeet Singh Marg, Katwaria Sarai
New Delhi- 110016
3. The General Manager
Northern Regional Load Despatch Centre
18-A, Qutab Institutional Area
Shaheed Jeet Singh Marg, Katwaria Sarai
New Delhi- 110016
4. The Chairman
Punjab State Power Corporation Ltd.
The Mall, Patiala-147001
5. The Chief Engineer
Haryana Power Purchase Centre
Shakti Bhawan, Sector VI
Panchkula-134019
6. The Chief Executive Officer
Tata Power Delhi Distribution Ltd.
33 kV Sub-station, Hudson Lines
Kingsway Camp, Delhi-110009
7. The Chief Executive Director
BSES Rajdhani Power Limited

2nd Floor, B- Block, Nehru Place
New Delhi- 110019

8. The Chief Executive Director
BSES Yamuna Power Ltd.
Shakti Kiran Building
Karkardooma, Delhi-110092

9. The Chief Managing Director
Ajmer Vidyut Vitran Nigam Ltd.
Old Power House, Hathi Bhasta
Jaipur Road, Ajmer

10. The Chief Managing Director
Jaipur Vidyut Vitran Nigam Ltd.
Vidyut Bhawan, Janpath
Jaipur-302005

11. The Chief Managing Director
Jodhpur Vidyut Vitran Nigam Ltd.
New Power House, Industrial Area
Jodhpur-342003

12. The Chairman
Himachal Pradesh State Electricity Board Ltd.
Vidyut Bhawan, Shimla-171004

13. The Development Commissioner (Power)
Power Development Department (J&K)
Government of J&K, Mini Secretarial, Jammu

14. The Chief Engineer
Power Department, Union Territory of Chandigarh
Additional Office Building, Sector 9D
Chandigarh

15. The Chairman
Uttar Pradesh Power Corporation Ltd.
Shakti Bhawan, 14, Ashoka Road
Lucknow-226001

16. The Chief Managing Director
Uttaranchal Power Corporation Ltd.
Urja Bhawan, Kanwali Road
Dehradun-248001

17. The Principal Secretary
Government of Himachal Pradesh
H.P. Secretariat, Shimla-171002

Subject: Petition for consideration of declared capacity of Nathpa-Jhakri Hydro Power Station (6X250MW) aggregating to 1500 MW and Rampur Hydro Power Station (6X 68.67 MW) aggregating to 412 MW. And The Minutes of the 120th and 122nd OCC Meetings of the Northern Regional Power Committee dated 24.2.2016 and dated 22.4.2016 on the scheduling and declaration of the capacity of Nathpa- Jhakri and Rampur Hydro Power Stations.

Sir/Madam,

The Commission, vide ROP for the hearing dated 9.2.2017, directed the Chief (Engg.) of the Commission to convene a meeting with the Petitioner and the Respondents to explore the possibility of resolving the issue. Accordingly, Chief (Engg.) after due consultation with all concerned has submitted a report to the Commission which is enclosed.

You are directed to submit your views/comments, if any, on the report, on an affidavit, on or before 10.10.2017. The Petition shall be listed for hearing on 26.10.2017.

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

Copy to:
Chief (Engg.), CERC.

Encl: as above

Central Electricity Regulatory Commission
(Engineering Division)

Sub:- Report in petition no. 150/MP/2016 based on the proceedings of the meeting called by Chief (Engineering) to resolve the issue raised by petitioner in the petition:

1. Issue raised by the petitioner in petition no. 150/MP/2016:

- a) SJVN Limited has established a Nathpa Jhakri Hydro Power Station (hereinafter referred as the 'Nathpa Jhakri Project') comprising of six (06) units of 250 MW each aggregating to 1500 MW on the river Sutlej. The project consists of a pondage/reservoir to hold water and to be released for generation of electricity keeping in view the optimum use of the water for generation and supply to Respondents 2 to 15 herein.
- b) SJVN Limited has also established the Rampur Hydro Power Station (hereinafter referred to as the 'Rampur Project') comprising of six (06) units of 68.67 MW at the downstream of Nathpa – Jhakri Project to harness and have optimum use of water getting released from the Nathpa – Jhakri Project again for generation and sale of electricity to the Respondents 2 to 15.
- c) Rampur Project is a unique generating station which does not have its own storage / pondage at all and is operating with water coming out from the Tail Race Tunnel of Nathpa Jhakri Project and thus is acting as tail race extension of Nathpa Jhakri Project. Hence, the Rampur Project is supporting the Grid for peaking purpose. The Sutlej water is actually stored at Nathpa Dam at the upstream of Nathpa Jhakri Project up to the maximum FRL during the lean season for providing peaking power as per the requirement of the Grid and in the larger public interest.
- d) Due to its unique operation, whenever one unit of Nathpa Jhakri Project is not available for any reason, correspondingly one unit of Rampur Project is also not able to generate power, inspite of availability of all its units. This is only due to less availability of water received from upstream project i.e. Nathpa Jhakri Project.
- e) Similarly, if one unit of Rampur Project cannot be operated for any reason, the operation of all six units of Nathpa Jhakri Project and release of water for the purpose would result in the wasteful/spillage of water, due to not being utilised for generation of electricity by Rampur Project for the capacity of one unit of 68.67 MW.
- f) In view of the above and in order to ensure that the water from the Sutlej river stored in the upstream reservoir of Nathpa Jhakri is effectively and optimally used for maximising

the generation; if any unit of either the Nathpa Jhakri or Rampur Project, as the case may be, cannot be operated for any reason, the corresponding project of Rampur or Nathpa Jhakri Project should also not run as the water from the pondage/reservoir is not released. The water in the reservoir is to be stored and kept available for future generation to effectively generate electricity at both Nathpa Jhakri Project and Rampur Project in tandem.

g) The above arrangement is beneficial to the Procurers of electricity being Respondents 2 to 15 herein, in that especially during the lean season, the water of Sutlej river is stored in the reservoir/pondage maintained upstream of the Nathpa Jhakri Project and gets released only when the generation is possible at both Nathpa Jhakri Project and Rampur Project in tandem. The objective is to have the benefit of both the capacities, namely, 250 MW of Nathpa Jhakri Project in tandem with 68.67 MW of Rampur Project for an aggregate capacity of 318.67 MW instead of having either 250 MW only or 68.67 MW only. The above scheme is not only a prudent utility practice to be adopted but also in the National interest and more particularly in the interest of the Procurers.

h) In terms of the Electricity Act, it is incumbent on SJVN Limited to adopt prudent utility practices of achieving optimum performance and efficiency and protect and safeguard the consumers' interest as well as the public interest in operating the two Hydro Electricity Generating Stations. Accordingly, it is not prudent for SJVN Limited to organise the release of water from the reservoir/pondage upstream of Nathpa Jhakri Project till such time the corresponding units of both the Nathpa Jhakri Project and Rampur Project can be operated in tandem.

i) SJVN Limited respectfully submits that the issue of declaration of capacity (DC) and the availability of the machines (notwithstanding the water availability issue) ought to be determined considering the above peculiar and unique nature of the operation of SJVN Limited at Nathpa Jhakri Project and Rampur Project.

j) The Tariff Regulations, 2014 notified by the Hon'ble Commission provides for the computation of the capacity charges and energy charges under Chapter 7 – Regulation 31 in regard to Hydro Generating Stations. In terms of the above Regulations, in the case of Hydro Generating Stations, the capacity will be considered to be available as long as the generating units/machines are in a position to generate and supply electricity, in the event of water being available for such generation. The generating units/machines ought to be considered for achievement of normative annual plant availability, in the case of Hydro Generating Stations as per Regulation 37 of the Tariff Regulations, 2014 as long as the

generating units/machines are available; even in the circumstances where the generating units cannot actually generate and supply electricity on account of water non-availability.

k) The water non-availability and consequently the non-generation of electricity shall not be treated as non-achievement towards the Plant Availability Factor (PAF), as long as the generating units and its machines are in a position to generate and supply electricity; despite the fact that the water being not available due to tandem operation, the actual generation does not take place.

l) SJVN Limited will suffer financially if PAF of either Nathpa Jhakri Project or of Rampur Project is reduced on account of non-availability of generating units/machines of the other. SJVN Limited submits that for the purpose of computation of PAF of Nathpa Jhakri Project, Rampur Project should be considered as if it is owned and controlled by an independent company and vice versa. If the Rampur Project had belonged to another entity, in such a difficult situation if water supply were not released by Nathpa Jhakri Project for generation at Rampur Project, the Rampur Project would not have been denied the PAF. Similarly, if on account of non-availability of the generating unit at Rampur Project, the Nathpa Jhakri Project is required not to operate one of its generating unit to avoid spillage of water, PAF of Nathpa Jhakri Project cannot be denied.

m) It is, therefore, respectfully submitted that there is a need for the Hon'ble Commission to intervene in the matter and declare that PAF of Rampur Project or the Nathpa Jhakri Project should not be affected if any of the generating unit of such project cannot be operated on account of the non-availability of generating unit of the other project.

n) It is also humbly submitted that though the above methodology was being followed in the scheduling by NRLDC for Rampur Project (Which was in a Slave-Master relationship with Nathpa Jhakri project) till 16.03.2016, however from March 17, 2016 onwards; there has been a shift in NRLDC's stands.

2. The petition was heard on 09.02.2017. Commission vide ROP of the hearing directed Chief (Engineering) to conduct a meeting with the petitioner, NRLDC and respondents for resolving the issue.

3. In line with the Commission's direction issued in Record of Proceedings (ROP) for holding meeting, Chief (Engineering), CERC called a meeting on 28.02.2017 at CERC office.

4. Following representatives of respective Organisations were present in the meeting:

Petitioner (SJVN):

- 1) Sh. R.K. Bansal, Director (Electrical), SJVN
- 2) Sh. Ramesh Kapoor, GM, SJVN

Respondents

- 1) Sh. P.K. Agarwal, GM, NRLDC
- 2) Sh. D.K. Jain, AGM, NRLDC

3) Sh. Rajeev Agarwal, Manager, SJVN

3) DGM, NRLDC

4) Sh. H.K. Pandey, S.E., NRPC

5) Sh. R.B.Sharma, Advocate,
BRPL

5. Chief (Engineering), CERC welcomed the participants and asked Petitioner/Respondents to present their views on the operational part of the projects.

i) SJVN explained that Nathpa Jhakri Hydro Power Station (NJHPS) is operating in consonance with Upstream Project i.e. Karcham Wangtoo Hydro Power Stations (KWHPs) owned by Himachal Baspa Power Company Limited. For smooth co-ordination, there is protocol signed between KWHPs and NJHPS especially during the outages of KWHPs and NJHPS, to shut down units in extreme circumstances one by one including high silt condition for optimum utilisation of water in the Northern Grid and to avoid sudden frequency repercussion. Now after commissioning of RHPS, above protocol was extended for RHPS also for coordinated operation of KWHPs, NJHPS and RHPS.

ii) SJVN also explained about tandem operation of Rampur Hydro Power Station (RHPS) with its Upstream Project i.e. NJHPS (both owned by SJVN). Further, SJVN reiterated its stand taken in the petition that for optimum utilization of water, same number of units of NJHPS and Rampur shall be scheduled by NRLDC in case there is a mismatch among the number of units available at NJHPS and Rampur. However, the PAF of the station with higher number of available units shall not be affected if any of the generating unit of such project cannot be operated on account of the non-availability of generating unit of the other project.

iii) NRLDC stated that both the projects (NJHPS and RHPS) are under SJVN, therefore optimum Declared Capacity of the projects should be given by SJVN to avoid the spillage of water. Further, during high inflow season, there is no difference in opinion with SJVN, as full discharge /inflow is being utilised by NJHPS and RHPS. However, during lean season, in case all six units of NJHPS are available and one unit of RHPS are under shut down, then there may be loss of energy in RHPS of 0.23 MU due to spillage of water at RHPS, if peaking support of 275 MW is scheduled for NJHPS.

iv) BRPL stated that SJVN is in the better position to control the spillage in efficient manner, as both the projects are under SJVN.

v) NRPC stated that power is being scheduled by NRLDC and all the issues has already been addressed by NRLDC and SJVN and therefore nothing is to be added in the regard.

Analysis and Recommendation:

6. Based on the deliberations with the petitioner, NLDC/RLDC, CEA and Respondent following position has emerged:

6.1 There are three Hydro generating stations namely Karcham Wangtoo Hydro Power Station (KWHPS) owned by Himachal Baspa Power Company Limited, Nathpa Jhakri Hydro Power station (NJHPS) and Rampur Hydro Power Station (RHPS) owned by SJVNL, which have been set up on the Sutlej river and are operating in tandem. There is an operational protocol signed between KWHPS and NJHPS for smooth co-ordination and operation of units in tandem. There appears to be a need of developing such a protocol for tandem operation of NJHPS and RHPS owned by SJVNL, in consultation with NLDC and discoms/beneficiaries.

6.2 The other point which needs consideration is that NJHPS has a storage at its up-stream for providing peaking support whereas there is no storage between NJHPS and RHPS, and therefore, in case of non availability of a unit at RHPS leads to spilling of water in case a corresponding unit of NJHPS is operated.

6.3 In this back drop, the question before the Commission is whether the sanctity of station wise declaration could be maintained or declaration has to be on combined basis for the SJVNL stations due to tandem operation. The matter has been examined in the light of above facts and following is brought out for the consideration of the Commission:

6.3.1 Operation During High Discharge Season:

i) There is agreement between system operator i.e NRLDC and SJVNL that during high discharge season, the separate D.C of each station could be considered as sufficient water is available and some spilling of water would not unduly affect SJVNL or the beneficiaries in terms of energy and peaking support.

6.3.2 Operation During Low Discharge Season

Scenario 1: The number of machines available at NJHPS are 6 (six) and number of units available at Rampur are 5 (five) –

Analysis for scenario 1:

i) In this scenario, the petitioner wants that PAF of NJHPS shall be calculated based on six units available for generation but NRLDC shall schedule only five units of NJHPS so that there is no spillage at Rampur where only five units are available. NRLDC is of the opinion that both the projects (NJHPS and RHPS) are under SJVN, therefore optimum Declared Capacity of the projects should be given by SJVN to avoid the spillage of water. It means that NRLDC is of the view that petitioner shall itself declare DC of NJHPS corresponding to five machines to avoid spillage of water at Rampur where only five machines are available.

ii) By the methodology professed by the petitioner, it gets the advantage of higher PAF corresponding to six machines at NJHPS even after running five machines. It further benefits the petitioner as the water saved at NJHPS by not running the sixth machine can be used to generate energy during non-peaking hours at NJHPS and Rampur i.e there would not be loss of 0.206 MUs at Rampur. This would ensure that petitioner is able to meet its design energy obligation of Rampur and would be able to recover "Energy Charges". However, in this case beneficiaries would loose peaking support of 250 MW from NJHPS even after paying capacity charges corresponding to six machines.

iii) As such, if NRLDC gives generation schedule to NJHPS corresponding to six units, the water corresponding to sixth machine would get spilled at Rampur resulting into energy loss which would affect both the petitioner and the beneficiaries. Petitioner is affected as it may not be able to meet its target of achieving design energy resulting into lower recovery of energy charges. Beneficiaries are affected as they would not be getting energy to the tune of 0.206 MUs due to spillage of water at Rampur.

Analysis & Recommendation on scenario 1:

iv) To give DC, based on machine and water availability, is the prerogative of the generator. For the first scenario, the petitioner would give DC corresponding to six machines for NJHPS as all six machines are available along with water availability and for five machines for Rampur. As such, the beneficiaries and system operator have two choices to make depending upon their need and grid requirements, respectively:

v) In case, during a day, peaking support is the priority of the beneficiaries and the system operator, then system operator either on beneficiaries advise or on its own accord, depending upon the system requirements, shall schedule all the machines of NJHPS. However, -in this situation, petitioner may be allowed to recover the energy charges for the

energy lost at Rampur for which the petitioner shall keep a block wise record of the energy lost at Rampur. In the event of non-recovery of full energy charges, petitioner shall furnish these details in the petition to be filed for recovery of shortfall in energy charges. For this choice made by the system operator/beneficiaries, there is no issue with regard to calculation of PAF for NJHPS as well as for Rampur.

vi) In case, during a day, peaking support is not the priority of beneficiary/system operator, system operator on beneficiaries advise, shall schedule five units of NJHPS. However, PAF of the NJHPS shall be calculated based on the six machines.

Scenario 2: The number of machines available at NJHPS are 5 (five) and number of units available at Rampur are 6 (six) –

Analysis for scenario 2

i) In this scenario, the petitioner, citing the unique nature of tandem operation, wants that PAF of Rampur shall be calculated based on six units available for generation in spite of the fact that water released from the upstream NJHPS is limited to operation of five machines in peaking mode at Rampur. NRLDC is of the opinion that in this scenario, Rampur cannot be allowed DC/PAF corresponding to six machines as the water availability as well as machine availability are two pre-requisites as per CERC Tariff Regulations, 2014 for declaring capability of a hydro station. NRLDC is of the view that petitioner shall itself declare DC of Rampur corresponding to five machines based on the water availability from the NJHPS.

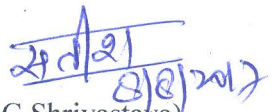
ii) By the methodology professed by the petitioner, it gets the advantage of higher PAF corresponding to six machines at Rampur even after providing peaking support corresponding to five machines. However, by this methodology, beneficiaries are the losers in terms of the fact that they shall be paying capacity charges for the peaking support not available to them.

iii) Going by the NRLDC version, petitioner's recovery of capacity charges for Rampur gets affected as it may not be able to meet the NAPAFA. Petitioner has prayed that it would be put to financial loss for reasons not attributable to it if NRLDC version is accepted.

Analysis & Recommendation on scenario 2:

iv) For this scenario, We are of the view that the criteria of machine availability along with water availability for declaration of DC and its subsequent consideration for PAF can not be relaxed. Considering the fact that both the plants are with SJVNL, there is a need for co-ordinating the planned outages among the two stations during lean period such that machine

availability at RHPS is not more than NJHPS during same blocks. Further, regarding the fact that forced outages of any units of NJHPS will affect the PAF of the Rampur, it is to mention that to start with Rampur has been awarded lower NPAF of 82% for initial two years of tariff setting 2014-19 to take care of such eventualities resulting due to tandem operation of the plant. Further, lesser PAF after accounting for the above scenario would find its way on normative basis in the NPAF of Rampur to be determined for the period 2016-19 based on the actual PAF achieved by the station during 2014-16. Accordingly, it may be provided that the petitioner shall declare DC of Rampur after taking into account the water released from NJHPS as well as availability of units.


(S.C. Shrivastava)
Chief (Engineering)