

**PUNJAB STATE ELECTRICITY REGULATORY COMMISSION
SCO NO. 220-221, SECTOR 34-A, CHANDIGARH**

**Petition No. 44 of 2017
Date of order: 21.12.2018**

Present: Ms. Kusumjit Sidhu, Chairperson
Sh. S.S. Sarna, Member
Ms. Anjuli Chandra, Member

In the matter of: Petition under Section 86(1)(b) of the Electricity Act, 2003 and Article 13 of the Power Purchase Agreement executed by the Petitioner and Punjab State Power Corporation Limited dated 01.09.2008, for the approval and consequent tariff adjustment sought by the petitioner due to a 'Change in Law' event viz. the introduction of new environmental norms by the Environment (Protection) Amendment Rules, 2015 resulting in additional capital and operating expenditure.

AND

In the matter of: Talwandi Sabo Power Limited, Talwandi Sabo Road, Banawala, District Mansa, Punjab – 151302

...Petitioner

Versus

Punjab State Power Corporation Limited, The Mall, Patiala, Punjab. 147001.

...Respondent

ORDER

Talwandi Sabo Power Limited (TSPL), has filed the present petition seeking approval and consequent tariff adjustment due to 'Change in Law' event as a result of the introduction of new environmental norms by the Environment (Protection) Amendment Rules, 2015 resulting in additional capital and operating expenditure.

2. The petition was admitted vide Order dated 25.07.2017. PSPCL filed reply to the petition vide Memo no. 6636 dated

23.08.2017 and TSPL filed rejoinder to the reply vide letter dated 10.10.2017. TSPL submitted a copy of letter no. 44/FGD/UMPP/CEA/2017 dated 09.10.2017 issued by Central Electricity Authority, Ministry of Power, Ultra Mega Power Projects Development Division, Govt. of India regarding adherence to environmental norms as per Environment (Protection) Amendment Rules, 2015, for thermal power stations which was taken on record and vide Order dated 31.10.2017, TSPL was directed to approach the Commission after it has been finally and suitably advised by CEA on all aspects of the matter, further, directing TSPL to furnish a copy of data submitted to CEA, to the Commission as well as PSPCL.

In compliance of the Order dated 31.10.2017, TSPL vide letter dated 08.01.2018 filed affidavit dated 05.01.2018 submitting the copy of the data provided to CEA further submitting that TSPL has already published Expression of Interest ("EoI") inviting offers from eligible and interested equipment suppliers to install the necessary equipments and accordingly PSPCL ought to be directed to participate in the said tendering process. PSPCL submitted reply dated 29.01.2018 to the affidavit filed by TSPL on 08.01.2018. TSPL vide letter dated 25.01.2018 filed modified feasibility report.

The petition was taken up for hearing on 01.02.2018 and vide Order dated 16.02.2018, the Commission expressed its view that initiation of Competitive bid process for furnishing of the said data is premature at this stage and the prayer of TSPL was disposed of accordingly further directing TSPL to submit the details/documents as under:-

- i) *Environmental clearances obtained by TSPL along with copy of the compliance report submitted to Punjab Pollution Control Board (PPCB) at the time of commissioning of the project and the approval given by PPCB. The environmental compliance reports submitted thereafter from time to time to PPCB indicating compliance of various norms / parameters and their acceptance reports as conveyed by PPCB, be also submitted;*
- ii) *Parameters achieved from the time of commissioning vis a vis norms (before January, 2017) and thereafter till January, 2018 as per continuous monitoring system;*
- iii) *The amounts kept in the project for complying with environmental norms as per directive of Ministry of Environment as under:*
- “(vi) Space provision shall be kept for retrofitting of FGD, if required at a later date.*
- (xxv) Separate funds should be allocated for implementation of environmental protection measures along with item-wise break-up. These costs should be included as part of the project cost. The funds earmarked for the environment protection measures should not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.”*
- Amounts spent with details and balance, if any;*
- (iv) *Copy of communication received from Central Pollution Control Board regarding revised timelines on FGD installation to meet revised environment norms and*

concurrence of Ministry of Power to the same, if available.

In compliance of the Order dated 16.02.2018, TSPL filed affidavit vide letter dated 26.03.2018. PSPCL vide memo no. 6742 dated 27.04.2018 filed reply to the affidavit filed by TSPL. TSPL vide letter dated 21.05.2018 filed an affidavit enclosing copy of the CEA's "Recommendation Report of CEA on Installation of FGD to meet Environment (Protection) Amendment Rules, 2015 notified by MoEF & CC" issued vide letter no. 44/FGD/UMPP/CEA/ 2017/ 364 dated 16.05.2018.

After hearing the parties, order was reserved vide Order dated 11.06.2018 observing that notwithstanding the final order in this petition, since the FGD has to be installed by December, 2019 as per CPCB and recommendations of CEA, TSPL should initiate the process for the same. TSPL and PSPCL were directed to provide the information as under:-

TSPL shall provide the following information within 10 days.

- i) MoEF's Order certifying SGS as the accredited agency for measuring emissions.*
- ii) The final month wise detailed report of SGS giving 'unit-wise' and 'plant as a whole' details of emissions.*
- iii) An explanation regarding variance in emission levels in the reports submitted by TSPL to various agencies / authorities i.e. PPCB, CEA and online data information.*
- iv) Data on emissions (along with graphical representation) viz Particulate matter, SO_x, NO_x and*

Hg etc. submitted at various times to PPCB / MoEF etc.

- v) *Details of the SO_x emission submitted to CEA and an explanation regarding maximum value of 2012 mg/Nm³ with testing reports in this regard.*
- vi) *The original design parameters for emissions for the plant as cleared by MoEF.*
- vii) *Ambient Air quality parameters specified at the time of commissioning of the plant viz-a-viz actually achieved parameters.*
- viii) *Target date for installation of FGD as indicated in CEA's report.*
- ix) *What is the proposal to meet the revised norms for NO_x.*
- x) *Extent of PSPCL's involvement in the whole process for installation of FGD/ competitive bidding etc.*
PSPCL shall submit the following information:
 - i) *Comments on the information to be supplied by TSPL.*
 - ii) *Proposal regarding extent of PSPCL's involvement in the whole process for installation of FGD/ competitive bidding etc.*
 - iii) *Comments on the issue of 'Change in Law'.*

TSPL vide letter dated 18.06.2018 filed rejoinder to the reply filed by PSPCL vide memo no. 6742 dated 27.04.2018. TSPL filed written submissions vide letter dated 18.06.2018 enclosing the copy of CEA's report dated 16.05.2018, copy of MoP's. letter dated 30.05.2018, copy of CERC's judgment in petition no. 104 of 2017 and copy of the judgment dated 11.04.2017 of Hon'ble Supreme

Court in case of Energy Watchdog V/s. CERC & Ors. TSPL submitted a copy of letter 26.06.2018 addressed to CEA and in compliance of the Order dated 11.06.2018 submitted information on affidavit vide letter dated 27.06.2018. PSPCL vide Memo No. 5241 dated 09.07.2018 filed written submissions.

3. The petitioner has submitted in the petition, in brief, as under:-
 - i) TSPL is a generating company within the meaning of Section 2(28) of the Electricity Act, 2003 and Power Purchase Agreement (PPA) was executed on 01.09.2008 between TSPL and Punjab State Electricity Board for sale of power from its 1980 (3x660) MW Thermal Power Plant at Mansa-Talwandi Sabo Road, District Mansa, Punjab. Pursuant to the PPA, TSPL commenced supply of power to PSPCL from the first Unit of its Project on 05.07.2014. After TSPL commenced the supply of power to PSPCL, and approximately 7 years after the Bid Deadline prescribed under the PPA, the Ministry of Environment, Forest and Climate Change, Government of India ("MoEF & CC") in exercise of its power under section 6 and section 25 of the Environment (Protection) Act, 1986 amended the Environment (Protection) Rules, 1986 vide the Environment (Protection) Amendment Rules, 2015, Gazette Notification No. 2620 on 07.12.2015. The Notification amended the standards of emission and the level of water consumption for all coal based thermal power plants in India. All operational thermal power stations and new thermal power stations in India are mandatorily required to comply with the new

environmental norms introduced through the Notification.

- ii) The Notification reduces the water consumption and emission limits inter alia of Sulphur Dioxide (SO₂), Nitrogen Oxide (NO_x) and Mercury. Thermal power plants are required to adhere to the specified emission and water consumption limits based on the year of their commissioning. Therefore, in order to comply with the Notification, TSPL is required, amongst others, to incur expenditure to undertake a variety of measures such as the installation of Flue Gas Desulphurization equipment (“FGD”), Selective Non Catalytic Reduction technology (“SCNR”) and a water treatment system. This expenditure was not factored in at the time of bid cut off date under the Competitive Bidding Guidelines i.e. June 16, 2008 as the Notification or any similar regulatory requirement was neither applicable or in force at that time nor envisaged by the MOEF&CC. A summary of the new norms is as under:-

Summary of new regulations on emissions

Sl. No.	Year of Commissioning	SPM	SO ₂	NO _x	Mercury
1.	Pre 2003	100mg/Nm ³	600mg/Nm ³ for <500MW 200mg/Nm ³ for >500MW	600mg/Nm ³	0.03mg/Nm ³ for >500MW
2.	2003-2016	50mg/Nm ³	600mg/Nm ³ for <500MW 200mg/Nm ³ for >500MW	300mg/Nm ³	0.03mg/Nm ³
3.	Post 2017	30mg/Nm ³	100mg/Nm ³	100mg/Nm ³	0.03mg/Nm ³

Summary of new regulations on water use

Sl. No.	New requirement
1.	All plants with Once Through Cooling (OTC) shall install Cooling Tower (CT) and achieve specific water consumption upto maximum of 3.5m ³ /MWh within a period of two years from the date of publication of notification.
2.	All existing CT-based plants reduce specific water consumption upto maximum of 3.5m ³ /MWh within a period of two years from the date of publication of notification
3.	New plants to be installed after 1 st January 2017 shall have to meet specific water consumption upto maximum of 2.5m ³ /MWh and achieve zero waste water discharged

- iii) In view of the above norms introduced for the first time by the Notification, the Petitioner is now required to comply with the following norms as its Power Station was commissioned in 2016 and it owns a Cooling Tower based thermal power plant comprising 3 Units of 660 MW each:

Year of Commissioning of Petitioner's Power Plant	SPM	SO ₂	NO _x	Mercury	Water consumption
2016	50mg/Nm ³	200mg/Nm ³ for >500MW	300mg/Nm ³	0.03mg/Nm ³	All existing CT-based plants reduce specific water consumption upto maximum of 3.5m ³ /MWh within a period of two years from the date of publication of notification.

- iv) The Notification, introducing stricter environmental emission standards and limiting the quantity of water consumption, is a 'Change in Law' under Article 13 read with Article 1.1 of the PPA. 'Law' as defined under the PPA, is an inclusive definition and *inter alia* includes any regulation, notification and rule of an Indian Governmental Instrumentality which has the force of law. The relevant excerpts of Article 1.1 of the PPA are as under:-

“...1. **ARTICLE 1: DEFINITIONS AND INTERPRETATION**

1.1 Definitions

The terms used in this Agreement, unless as defined below or repugnant to the context, shall have the same meaning as assigned to them by the Electricity Act, 2003 and the rules or regulations framed there under, including those issued/framed by Appropriate Commission (as defined hereunder), as amended or re-enacted from time to time....

“Indian Government Instrumentality” means the GOI, Government of Punjab, and any ministry or, department or board or agency other regulatory or quasi-judicial authority controlled by GOI or Government of the State where the Procurer and Project are located and includes the Appropriate Commission;

“Law” means, in relation to this Agreement, all laws including Electricity Laws in force in India and any status, ordinance, regulation, notification or code, rule, or any interpretation of any of them by an Indian Governmental Instrumentality and having force of law and shall further include all applicable rules, regulations, orders notifications by an Indian Governmental Instrumentality pursuant to or under any of them and shall include all rules, regulations, decisions and orders of the Appropriate Commission...”

The MoEF & CC is a ministry of the Central Government and is therefore an Indian Government Instrumentality under the PPA and the Notification is ‘Law’ as contemplated by the PPA.

- v) Article 13 of the PPA contemplates *ipso facto* compensation by way of a tariff adjustment for all Changes in Law to put an affected party in the same economic position as if such

Change in Law has not occurred. Indeed, it is also the industry practice in the power sector, particularly in respect of Change in Law events that the procurer compensates the seller for any increase or additional expenditure incurred pursuant to the change in law. Several decisions of this Commission and the Hon'ble Appellate Tribunal for Electricity (Hon'ble APTEL) have reinforced the said industry practice. Article 13 of the PPA along with the relevant definition clauses under the PPA are excerpted below for convenience:

"...Operating Period in relation to the Unit means the period from its COD and in relation to the Power Station the date by which all the Units achieve COD, until the expiry or earlier termination of this Agreement in accordance with Article 2 of this Agreement;...."

13. ARTICLE 13 CHANGE IN LAW

13.1 Definitions

In this Article 13, the following terms shall have the following meanings:

13.1.1 "Change in Law" means the occurrence of any of the following events after the date, which is seven (7) days prior to the Bid Deadline:

(i) the enactment, bringing into effect, adoption, promulgation, amendment, modification or repeal, of any Law or

(ii) a change in interpretation of Law by a Competent Court of law, tribunal or Indian Governmental Instrumentality provided such Court of law, tribunal Governmental Instrumentality is final authority under law for such interpretation or

(iii) change in any consents approvals or licenses available or obtained for the Project, otherwise than for default of the Seller, which results in any change in any cost of or revenue from the business of selling electricity by the Seller to the Procurer under the terms of this Agreement, or (iv) any change in the (a) Declared Price of Land for the Project or (b) the cost of implementation of the resettlement any rehabilitation package of the land for the Project mentioned in the RfP or (c) the cost of implementing Environmental Management Plan for the Power Station (d) Deleted but shall not include (i) any change in any withholding tax on income or dividends distributed to the shareholders of the Seller, or (ii) change in respect of UI charges or frequency intervals by an Appropriate Commission.

13.1.2 “Competent Court” means:

The Supreme Court or any High Court, or any tribunal or any similar judicial or quasi-judicial body in India that has jurisdiction to adjudicate upon issues relating to the Project.

13.2 Application and Principles for computing impact of Change in Law

While determining the consequence of Change in Law under this Article 13, the Parties shall have due regard to the principle that the purpose of compensating the Party affected by such Change in Law, is to restore through Monthly Tariff payments, to the extent contemplated in this Article 13, the affected Party to the same economic position as if such Change in Law has not occurred.

(a) Construction Period

As a result of any Change in Law, the impact of increase/decrease of Capital Cost of the Project in the Tariff shall be governed by the formula given below: `

For every cumulative increase/decrease of each Rs. 25,00,00,000/- (Rupees Twenty Five Crore) in the Capital Cost over the term of this Agreement, the increase/decrease in Non Escalable Capacity Charges shall be an amount equal to 0.267% (percentage zero point two six seven) of the Non Escalable Capacity Charges. Provided that the Seller provides to the Procurer documentary proof of such

increase/decrease in Capital Cost for establishing the impact of such Change in Law. In case of Dispute, Article 17 shall apply.

It is clarified that the above mentioned compensation shall be payable to either Party, only with effect from the date on which the total increase/decrease exceeds amount of Rs. 25,00,00,000/- (Rupees Twenty Five Crore).

(b) Operation Period

As a result of Change in Law, the compensation for any increase/decrease in revenues or cost to the Seller shall be determined and effective from such date, as decided by the Central Electricity Regulatory Commission whose decision shall be final and binding on both the Parties, subject to rights of appeal provided under applicable Law.

Provided that the above mentioned compensation shall be payable only if and for increase/decrease in revenues or cost to the Seller is in excess of an amount equivalent to 1% of the Letter of Credit in aggregate for a Contract Year.

13.3 Notification of Change in Law

13.3.1 If the Seller is affected by a Change in Law in accordance with Article 13.2 and wishes to claim a Change in Law under this Article, it shall give notice to the Procurer of such Change in Law as soon as reasonably practicably after becoming aware of the same or should reasonably have known of the Change in Law.

13.3.2 Notwithstanding Article 13.1.1, the Seller shall be obliged to serve a notice to the Procurer under this Article 13.3.2 if it is beneficially affected by a Change in Law. Without prejudice to the factor of materiality or other provisions contained in this Agreement, the obligation to inform the Procurer contained herein shall be material. Provided that in case the Seller has not provided such notice, the Procurer shall have the right to issue such notice to the Seller.

13.3.3 Any notice served pursuant to this Article 13.3.2 shall provide, amongst other things, precise details of:

(a) the Change in Law; and

(b) the effects on the Seller of the matters referred to in Article 13.2.

13.4 Tariff Adjustment Payment on account of Change in Law

13.4.1 Subject to Article 13.2, the adjustment in Monthly Tariff Payment shall be effective from:

(i) the date of adoption, promulgation, amendment, re-enactment or repeal of the Law or Change in Law; or

(ii) the date of order/judgment of the Competent Court or tribunal or Indian Governmental Instrumental, if the Change in Law is on account of a change in interpretation of Law.

13.4.2 The payment for Changes in Law shall be through Supplementary Bill as mentioned in Article 11.8. However, in case of any change in Tariff by reason of Change in Law, as determined in accordance with this Agreement, the Monthly Invoice to be raised by the Seller after such change in Tariff shall appropriately reflect the changed Tariff...”

On a combined reading of Article 13 with Article 1.1 of the PPA, the Notification squarely falls within the meaning of Change in Law agreed between the parties under the PPA. The impact of the said Change in Law event is in the ‘Operating Period’ of TSPL’s Power Station as it has occurred after the Commercial Operation Date of the last unit of the Power Station i.e. on 25.08.2016. Resultantly, the Petitioner is entitled to compensation in the form of an upward tariff adjustment for Change in Law in accordance with Article 13 of the PPA. The Notification mandates and necessarily results in additional expenditure by TSPL towards the installation of all the necessary equipment to ensure compliance of the new norms. Moreover, TSPL cannot proceed with its business of selling electricity without implementing the binding stipulations of the Notification by incurring additional capital and operating costs. Further, the PPA inadvertently

refers to the Hon'ble '*Central Electricity Regulatory Commission*' instead of this Commission. As TSPL supplies the entire quantum of power generated at its Power Station on an intra-state basis to PSPCL within the state of Punjab, TSPL falls squarely within this Commission's jurisdiction under Section 86 of the Electricity Act, 2003. TSPL requested the Commission to determine the compensation through adjustment in tariff due to TSPL as a result of the aforesaid Change in Law event as per terms of the PPA.

- vi) According to the proviso to Article 13.2 (b) of PPA, TSPL will be entitled to tariff adjustment for any change in law (to put the affected party in the same economic position as if such Change in Law had not occurred), provided that the impact of the said Change in Law is more than 1% of the aggregate of Letter of Credit amount in a Contract Year. At present, the Letter of Credit issued by PSPCL to TSPL under Article 11.4.1 of the PPA is Rs. 131.64 crore and 1% of the same is approximately Rs.1.32 crore. The estimated capital expenditure to be incurred by TSPL for complying with the Notification is approximately Rs. 1.53 Crore/ MW, which far exceeds the threshold of 1% of aggregate Letter of Credit amount under the PPA. The Operating expenses to be incurred by TSPL shall be in addition to the aforesaid estimated capital expenditure. Thus, the Notification falls squarely within the meaning of a Change in Law event under Article 13 of the PPA.
- vii) The Competitive Bidding Guidelines also provide for compensation on account of change in law events. The same is borne out from paragraph 4.7 of the Competitive Bidding Guidelines, which is excerpted below for perusal:

“...4.7: Any Change in Law impacting cost or revenue from the business of selling electricity to procurer with respect to the law applicable on the date which is 7 days before the last date for RFP Bid submissions shall be adjusted separately...”

- viii) TSPL informed PSPCL of the Notification vide its letter dated 14.01.2016 and enclosed a copy of the same therewith. TSPL clearly and unambiguously apprised PSPCL of the Notification and the consequent measures it will have to undertake to comply with the new environmental norms. Therefore, TSPL amply satisfied the requirement of notifying PSPCL of the occurrence of the Change in Law, as prescribed under Article 13.3.3 of the PPA.
- ix) The subsequent events and correspondence exchanged with PSPCL are as under:
 - a) TSPL sent a letter dated 16.09.2016 to PSPCL reiterating the Change in Law brought by the Notification. In the letter dated 16.09.2016, TSPL also notified PSPCL that it is in the process of undertaking discussions with expert technical consultants to evaluate various technologies/ equipment that would be required to be installed as well as an estimate of the financial implication to install the same. From the very beginning, it has been TSPL's bona fide endeavour and demonstrable effort to pro-actively apprise PSPCL of all developments in the matter and seek its guidance and support for the same. TSPL intends on continuing to keep PSPCL abreast and involve PSPCL as a key stakeholder throughout the process of implementing the requirements of the Notification.
 - b) TSPL appointed Tata Consulting Engineers Limited (“TCE”) as its

consultant for the purpose of evaluating various aspects of compliance with the Notification. TCE submitted certain draft reports, which were also shared with PSPCL.

- c) TSPL addressed another letter dated 12.01.2017 to PSPCL reiterating the change in environmental norms brought by the Notification. Further, based on the available draft Feasibility Report at the time, TSPL apprised PSPCL of the approximate financial implication of complying with the Notification and the time required for installation of the equipment to ensure compliance with the new norms. TSPL had enclosed the copy of the draft Feasibility Report with the said letter.
- d) TSPL again wrote to PSPCL on 06.02.2017 reiterating the Change in Law event and requesting PSPCL for their approval to proceed with the installation of necessary equipment. TSPL took all necessary steps to apprise PSPCL of the occurrence and impact of the Change in Law brought about by the Notification. The process of purchasing all the necessary equipment, engaging a competent contractor and all appurtenant exercises to implement the requirements of the Notification cannot be commenced without the prior approval of the Commission.
- e) PSPCL responded to the TSPL's communications vide its letters dated 07.02.2017, 09.02.2017, 17.03.2017, 03.04.2017 and 03.05.2017. PSPCL raised certain queries and sought specific information from TSPL. TSPL responded to PSPCL's queries and information requests vide its letter dated 18.03.2017, 05.05.2017, 25.05.2017 and 23.06.2017.
- f) After discussions with PSPCL on 08.05.2017 and 07.06.2017,

- TSPL discussed the matter with TCE to update its draft report. Subsequently, TCE submitted their final 'Feasibility Report to meet New Emission Regulations of MOEF&CC' ("Feasibility Report") on 15.06.2017 to TSPL. The Feasibility Report examines various technologies available to reduce emission and water consumption in line with the Notification. The Feasibility Report also analyses the impact and timelines of installation of the various technologies keeping in mind the coal ash content of 34% and Sulphur content of 0.50%. TSPL shared a copy of the final Feasibility Report with PSPCL vide its letter dated 23.06.2017
- x) TSPL had duly notified PSPCL of the Notification from time to time and therefore complied with the requirement of 'Notice' as contemplated by the PPA under Article 13.3. As per Article 13.3.3 of the PPA, a valid notice for change in law requires (i) the change in law; and (ii) the effects on the seller on the matters referred to in Article 13.2. TSPL promptly notified PSPCL of the occurrence of the Change in Law as well as the anticipated impact of the same vide its letter dated 14.01.2016.
- xi) The obligation to compensate TSPL by way of adjusted tariff on account of additional expenditure to be incurred due to a Change in Law has been expressly undertaken by PSPCL under Article 13 of the PPA. It is settled law that a generating company must be compensated by way of adjusted tariff by a power purchaser to compensate for expenditures incurred due to changes in law. Moreover, PSPCL is bound to compensate TSPL by the general law of contract and the prevalent industry practice.
- xii) The Notification necessarily requires a significant additional

expenditure by TSPL towards the installation of the necessary equipment, operating expenditure and other expenditures to ensure compliance with the new norms. TCE's preliminary assessment estimates that TSPL will be required to incur additional expenditure to the tune of approximately Rs. 2.7 Crore/ MW. The aforesaid estimate covers fixed capital expenditure and recurring operational expenditure for next 20 years capitalised as on the date of this Petition, including the following:(a) expenditure towards installation of the equipment required to comply with the Notification; (b) increase in operating costs towards operating the additional equipment installed; (c) increase in auxiliary consumption in the range of 1.6% per Unit will also result in reduction of the Contracted Capacity thereby necessitating tariff adjustment and amendment to the PPA; (d) opportunity cost lost due to the inevitable shutdown of the Power Station for the brief period of installation of the necessary equipment as indicated in the Feasibility Report; (e) charges incurred during the installation phase of the additional equipment; and (f) additional recurring cost towards waste disposal etc. Further, TSPL will also incur various legal and administrative costs in pursuing the instant Petition, which should also be compensated through tariff. TSPL craves the leave of the Commission to furnish the exact cost incurred to comply with the Notification along with all necessary supporting documents as and when TSPL incurs such costs.

- xiii) As per TSPL's preliminary estimates based on TCE's Feasibility Report, the implementation of the required equipment in order to comply with the Notification is tentatively expected to conclude by March, 2022. However, it is clarified that this timeline is subject to

change based on the exact technology selected to be implemented, time as to be given by technology supplier and other uncontrollable variables.

- xiv) For the purposes of selecting appropriate equipment suppliers, contractors and any other agencies that may be necessary to be appointed to ensure compliance with the Notification, TSPL proposes to conduct a transparent competitive bidding process in coordination with PSPCL. Subject to the Commission's approval, the capital expenditure costs to be incurred by TSPL in order to comply with the Notification shall be firmed up pursuant to the said competitive bidding process. In this regard, the Commission may adopt an appropriate commercial methodology in accordance with prevalent industry practice to streamline TSPL's recovery of the Change in Law compensation due to it from PSPCL. In order to prevent a sudden or abrupt change to end consumers of Punjab state in any particular years and to avoid payment of unnecessarily higher interest during construction (IDC), the Commission may allow gradual tariff adjustments based on costs to be incurred for the implementation of appropriate technology solution for compliance of MOEF & CC's notification and that from FY 2017-18 onwards to be increased on an annual basis based on costs incurred during the particular year for such implementation.
- xv) Prior in-principle approval of the resultant compensation due to TSPL is critical for TSPL to tie up adequate financing arrangements to ensure the timely availability of funds to implement the technology necessitated by the Notification. In the absence of the Commission's prior approval, TSPL's compliance with the Notification would not be

possible or financially feasible.

xvi) TSPL has prayed to:-

- a) Declare that the promulgation of the Environment (Protection) Amendment Rules, 2015 is a Change in Law in accordance with Article 13 of the Power Purchase Agreement dated 01.09.2008 executed between TSPL and PSPCL and that TSPL is entitled to relief thereunder;
- b) Direct PSPCL to compensate TSPL for all costs to be borne by TSPL in order to comply with the Environment (Protection) Amendment Rules, 2015 through tariff;
- c) Allow compensation through an annual increase in tariff payable by PSPCL to TSPL under the PPA commensurate with the costs incurred by TSPL in implementing appropriate technology solutions for compliance with the Grant in-principle approval for implementation of appropriate technology solutions in order to comply with Environment (Protection) Amendment Rules, 2015 commencing from FY 2017-18 onwards on the basis of costs incurred in each financial year;
- d) Allow the reimbursement of the legal and administrative costs incurred by TSPL in pursuing the instant Petition;

4. PSPCL in the reply to the petition has submitted, in brief, as follows:-

- i) The issues raised by TSPL in the Petition have to be considered with reference to the specific claims in the context of Article 13 of the PPA. The compensation is payable under Article 13 only after the expenditure has been incurred and therefore the Petition is premature at this stage. There is no provision in the PPA for in-principle

approval before the expenditure has been incurred. Further the compensation, if any, can be claimed and is to be provided only to the extent contemplated in Article 13. TSPL has not provided any details of the computation of expenditure under each head in the Petition. Hence, the Petition is incomplete and cannot be entertained.

- ii) TSPL has claimed the amendment in Environment (Protection) Rules as Change in Law. However, for the change in law, the law as prevailing on the cut-off date for TSPL is to be considered, including the requirement for various consents and clearances to be obtained and the conditions imposed therein. TSPL was aware as on cut-off date that the project required to obtain various consents and clearances and the Environment Authorities were entitled to impose conditions for such clearances and conditions. Therefore if the Environment Clearance or Consents provide for a condition on the operations of the TSPL's power project prior to the Amendment to the Rules, then the Amendment is not a change in law since TSPL was already subject to the said conditions. The Amendment can be considered a Change in Law only to the extent that it imposes new conditions or makes the existing conditions more stringent.
- iii) TSPL is required to produce all Clearances and Consents given to the TSPL's project and specify the conditions/standards as applicable to TSPL prior to the Amendment to enable the Commission to consider the aspect of change in law. Similarly, TSPL is required to place on records the standards prescribed under Environment Protection Rules, 1986 and by Central Pollution Control Board and Punjab Pollution Control Board under Air (Prevention and Control of Pollution) Act, 1981 as on cut-off date. Further, the effect of any

change in law subsequent to the cutoff date is restricted to incremental cost or additional expenditure on installation or up-gradation of the plant and equipment to be installed by reason of change in law over and above the expenditure which was in any event required to be incurred even in the absence of such change in law and not for the entire capital expenditure.

- iv) The Amendment to the Environment Protection Rules relates to the following:
- a) Quantum of Water Consumption
 - b) Emission Limits for Sulphur Dioxide
 - c) Emission Limits for Nitrogen Oxide
 - d) Emission Limits for Mercury
 - e) Emission of Suspended Particulate Matter

In the present case, TSPL has claimed the impact of the Amendment for Installation of Flue Gas Desulphurization equipment (FGD) for reduction in Sulphur Dioxide emission and Selective Non Catalytic Reduction Technology (SCNR) for reduction in Nitrogen Oxide emission. As per the Feasibility Report, TSPL is already meeting the Emission limits for Suspended Particulate Matter and Mercury as well as for water consumption. In the Letter dated 18.03.2017, TSPL has stated that there is no additional cost implications in regard to water system. Further the Environment Clearance required the installation of high efficiency Electrostatic Precipitator (ESP) to ensure that Particulate Matter emission does not exceed 50 mg/Nm³, which is also the new standard. Further, the Environment Clearance required TSPL to monitor the emission standards, inter alia, of SO₂ and NO_x and ensure that the same are within prescribed limits. Therefore, it is

quite possible that TSPL was already subject to the said conditions by way of other clearances, consents or standards to meet the same standards as is required to be met now under the amended Rules.

- v) TSPL has claimed the expenditure on installation of FGD as change in law. This is based on the premise that there was no stipulation or condition for installation of FGD on the cut- off date. Under Environmental Laws, the Environment Clearance is required to be obtained for the power project. This was known to TSPL as on the cut-off date. Further, it was known that the Environment authorities could impose conditions as they think appropriate in the grant of such Environment Clearance and TSPL was not entitled to proceed on the basis that Environmental Clearance shall be absolute and unconditional.
- vi) The Environment Clearance dated 11.07.2008 envisaged the installation of FGD as under:
“(vi) Space provision shall be kept for retrofitting of FGD, if required at a later date.
(xxv) Separate funds should be allocated for implementation of environmental protection measures along with item-wise break-up. These costs should be included as part of the project cost. The funds earmarked for the environment protection measures should not be diverted for other purposes and year-wise expenditure should be reported to the Ministry...”
- vii) The issue of installation of FGD as Change in Law as per a similar stipulation as mentioned above was considered by the Hon’ble

Appellate Tribunal in M/s JSW Energy Limited v/s. Maharashtra State Electricity Distribution Co. Ltd and Another dated 21.01.2013 in Appeal No. 105 of 2011. The Environment Clearance granted to JSW had the similar conditions as cited above in TSPL's Clearance.

- viii) The existing clearances require TSPL to use coal with Sulphur and ash content not exceeding 0.5% and 34% respectively. The emission of SO₂ as existing should be considered based on the forgoing paras. Therefore, the obligation under the Amendment, if at all to be considered, is to be considered as the measures which are required for reduction from the above emission standards to the new standard of 200 mg/Nm³.
- ix) The Feasibility Report has considered the existing SO₂ emission at 2012 mg/NM³, which has to be reduced to 200 mg/Nm³. The said assumption is contrary to the actual emission. As per the Stack Monitoring Data submitted by TSPL with letter dated 18.03.2017 which is the data reported to Punjab Pollution Control Board, the existing emissions varied significantly between 599.67 mg/Nm³ to 1769.6 mg/Nm³. TSPL has not provided adequate explanation for such variation in the SO₂ emission. If it is possible for TSPL to achieve emission levels of 500 to 900 mg/Nm³, then why does the emission go up to 1769.6 mg/Nm³. Further, there is no emission at 2012 mg/Nm³. Therefore, it is not clear, how the assumption was made in the Feasibility Report for considering 2012 mg/Nm³. Most of the time, the emission is actually lower than or around 1000 mg/Nm³ which is less than half of the assumed emission. In fact the Report has considered even the design coal emission at 1565 mg/Nm³ even though clearly, the emission has been much less than that for most of

the time. The assumption in the Feasibility Report and the size and capacity of the FGD considered is erroneous and cannot be considered.

- x) In the earlier Feasibility Reports, the emission at 2738 mg/Nm³ or more was considered. PSPCL had objected that the Report considered coal of higher than 0.5% sulphur content, which was not permissible to TSPL. Thereafter the Feasibility Report has been revised; however the FGD of same size and capacity is being considered in the present report. Further, in the present feasibility report vis-à-vis the earlier feasibility reports, the quantity of Limestone required has been revised and reduced from 910 TPD to 623 TPD. The quantity of Gypsum to be generated for all three units has also been reduced from 1555 TPD to 1084 TPD. TSPL has not reduced the capital cost of "Gypsum storage and handling system" as well as "Limestone unloading and conveying system."
- xi) The Feasibility Report has considered the NO_x at 385 mg/Nm³ (at partial load) which is to be reduced to 300m mg/NM³ by installation of Selective Non Catalytic Reduction Technology (SNCR). As mentioned in the feasibility report by TSPL the existing units are equipped with combustion control technologies of Low NO_x Burners (LNBS) with supply of over fire air through the Close-Coupled Over Fire Air (COFA) ports as well as Separated Over Fire Air (SOFA) ports in the furnace. Further as per the report, by tuned and coordinated operation of the existing LNBS with regulated supply of optimal amount of excess air through COFA and SOFA ports, a minimum NO_x reduction efficiency of 45% could be achieved. The combustion tuning and optimization of the existing technology to

reduce the NO_x below 300 mg/Nm³ is within the control of the TSPL and no additional expenditure can be considered in this regard. The combustion technology is already existing and TSPL is required to maintain it.

- xii) From the Stack Monitoring data, the emission of NO_x is varying from 175.28 to 482. Again, there is no explanation for such variation and if it is possible for TSPL to control the emission to within 300 mg/Nm³, it may not need any additional equipment. Even if TSPL can control it close to 300 mg/Nm³, the capacity of SNCR required can be reduced. TSPL is required to provide explanation for the variation in emission.
- xiii) Assuming but not admitting that there is a change in law, the relief is restricted to Article 13 of the PPA. The contents of the Feasibility Report are not admitted and the Commission may consider the prudence and appropriateness of the observations and recommendations in the said report. The prudence check would be required to ensure that TSPL has not incurred unnecessary or imprudent costs or whether there is any increase in auxiliary consumption or operating expenditure which are passed on to the PSPCL and to the consumers of the State.
- xiv) PSPCL submitted the following with regard to various claims:
 - a) The combustion tuning charges cannot be considered.
 - b) The Contingency and Engineering & Project Management costs are without any basis.
 - c) The opportunity cost i.e. the profit that TSPL could have made cannot be considered as relief under change in law. There is no

default of PSPCL, which resulted in shut down in the Power Station. In any event, the computation is not correct.

- d) There can be no reduction in the contracted capacity or otherwise any adjustments in the Tariff for such contracted capacity. The Competitive Bid was called for a certain capacity and that cannot be varied. Further TSPL is required to install energy efficient machinery.
 - e) There is no account for charges to be incurred in installation phase and the same cannot be considered as change in law.
 - f) The alleged legal and administrative costs cannot be recovered as change in law.
 - g) TSPL has recorded that Gypsum is a saleable commodity, but the revenue on account of sale of Gypsum has not been taken in to consideration.
- xv) The Hon'ble Central Commission has sought the views of Central Electricity Authority in cases of various Generators including Coastal Gujarat Power Limited/Sasan Power Limited as well as for Maithon Power Limited for technology to be adopted and associated cost etc. Similarly, Uttar Pradesh Electricity Regulatory Commission has also referred the issue to Central Electricity Authority. As per the orders of the Hon'ble Central Commission in various cases, the matter regarding the technology to be used, it's cost, down time period and other technical issues etc. need to be referred to Central Electricity Authority (CEA); however PSPCL brings on record that:
- a) The rate of Limestone has increased from Rs. 1500 per Metric Ton to Rs. 2600 per Metric Ton as per the present feasibility report vis-à-vis previous feasibility reports submitted by TSPL.

b) The amount of Civil Works cost (common) has increased from Rs. 6405 lac to Rs. 22981 lac as per the present feasibility report vis-à-vis previous feasibility reports submitted by TSPL.

The increase in cost is in-ordinate and unjustified. TSPL is required to explain the same. After such prudence check, if any amount is payable, it has to be considered whether the amount exceeds the requirement under the PPA.

5. The rejoinder by TSPL to the reply of PSPCL, in brief, is as under:-

i) The bid under the PPA in terms of the competitive bidding process conducted in respect of the Project was 23.06.2008 ("Bid Deadline"). Under Article 13 of the PPA, any Change in Law is to be evaluated with reference to the date which is 7 days prior to the Bid Deadline i.e. 16.06.2008 ("Cut-Off Date"). Pursuant to the PPA, TSPL commenced supply of power to PSPCL from the first Unit of its Project on 05.07.2014. After TSPL commenced the supply of power to PSPCL, and approximately 7 years after the Cut-Off Date, the Ministry of Environment, Forest and Climate Change, Government of India ("MoEF") in exercise of its power under section 6 and section 25 of the Environment (Protection) Act, 1986 amended the Environment (Protection) Rules, 1986 vide the Environment (Protection) Amendment Rules, 2015, Gazette Notification No. 2620 on 07.12.2015 ("Notification"). The Notification amended certain key environmental norms for all coal based thermal power plants.

ii) PSPCL's argument that relief for change in law can only be claimed once the expenses flowing from a change in law event have actually

been incurred is denied as being false and based on an erroneous understanding of law. A bare perusal of Article 13 of the PPA shows that the incurring of any expenditure is not a condition precedent for claiming relief for a change in law event, so this argument of PSPCL is wholly unfounded. The only trigger for whether change in law relief is to be allowed in the “operating period” of the Project, is whether a change in law event has occurred, which will result in an increase in cost to the Petitioner equivalent to more than 1% of the Letter of Credit in aggregate opened for a Contract Year. More specifically, as per Article 13.4.1 of the PPA, the adjustment in Monthly Tariff shall be effective from the date of its adoption or the date of the order of the competent court i.e. this Commission. Thus, no part of Article 13 can operate as an embargo for seeking a declaration from the Commission that a ‘change in law’ event under PPA is occasioned due to revision of emission norms by MoEF; and for grant of an in-principle approval for claiming the expenses flowing from a change in law event before such expenses are incurred. In light of the fact that the petitioner has to put in place the requisite infrastructure at a huge expense to comply with the Notification, obtaining the Commission’s prior in-principle approval is of critical importance so as to obtain the requisite financing to do the same. Finally, TSPL has provided all requisite details to PSPCL regarding expected expenditure under each head in the Feasibility Report dated 15.06.2017 prepared by Tata Consulting Engineers Limited vide its letter no. 117 dated 23.06.2017 to PSPCL, so, PSPCL cannot plausibly argue that the claim is premature. The fact that PSPCL is disputing the claim of TSPL in respect of coverage under ‘change in law’ clause of PPA is

sufficient to confer appropriate jurisdiction on this Commission under the Electricity Act, 2003 to adjudicate this dispute regarding interpretation of the PPA.

- iii) PSPCL's argument that TSPL should have foreseen the imposition of different emission standards in light of the fact that the conditions subject to which environmental clearances are granted are routinely altered is wholly fallacious and denied. Accepting PSPCL's argument would render all change in law clauses nugatory, inasmuch as the principal object of such clauses is to protect a party against the variation of any conditions or covenants subject to which it is granted a statutory consent. Further, it is submitted that the notification imposes new conditions as regards the permissible emission levels for the specified gases and quantum of water consumption which were in no way within the contemplation of the parties on the Cut-off Date, which is relevant for determination of 'change in law' event. Hence, PSPCL's argument to the contrary wholly lacks merit and is denied. The Consent that was granted to TSPL and all the project cost estimates prepared by it were based on the Environmental Impact Assessment study report submitted by PSPCL to MOEF as per which SO_x emissions were estimated to be 3141 Kg/H, stack emissions/ Flue of NO_x was 2827 Kg/H and stack emissions/ Flue of Particulate Matter ("PM") as 91.8 Kg/H. This is significantly different from the norms prescribed by the Notification, thereby necessitating vast additional expenditure to install the appropriate technology. All the other consents / approvals that TSPL obtained at the time of setting up the Project i.e. as on the Cut-Off Date, which are outlined

below, do not contain any conditions that would have a bearing on the emission norms introduced by the Notification:

- a) NOC from Chief Wild Life warden;
 - b) NOC for stack height from Airport Authorities of India;
 - c) Water Linkage clearance from state irrigation Department;
 - d) The standards prescribed under the Air (Prevention and Control of Pollution) Act, 1981;
 - e) The Charter on Corporate Responsibility for Environmental Protection, 2003;
 - f) The Change in Land Use Consent dated 29.08.2008 as amended on 23.06.2009;
 - g) Site Approval dated 25.08.2009;
 - h) The Consent to Establish dated 08.09.2009 as amended on 26.07.2010;
 - i) The Environmental Clearance dated 11.07.2008 as amended on 25.03.2010, 17.06.2010 and extended on 30.09.2013; and
 - j) The standards prescribed under the Environment (Protection) Act, 1986, the unamended Environmental (Protection) Rules, 1986 and by Central Pollution Control Board and Punjab Pollution Control Board ("PPCB") under the Air (Prevention & Control of Pollution) Act, 1981.
- iv) PSPCL's argument that the obligation to install flue gas desulphurization ("FGD") equipment imposed by the Notification does not constitute a change in law is wholly baseless and misconceived. In this respect, the relevant provisions of the Project's Consent which,

PSPCL argues, contemplates the installation of the FGD system are quoted below:-

"...(vi) Space provision shall be kept for retrofitting of FGD, if required at a later date.

...

(xxv) Separate funds should be allocated for implementation of environmental protection measures along with item-wise break-up. These costs should be included as part of the project cost. The funds earmarked for the environment protection measures should not be diverted for other purposes and year-wise expenditure should be reported to the Ministry..."

It is clear from the above-quoted text of the Consent that it does not contemplate the installation of a new FGD system as a mandatory condition. The Consent merely provides that adequate space is to be allocated within the Project premises for retrofitting of an FGD system, if required. TSPL has complied with the said requirement and such space has been made available in compliance with the conditions of the Consent. Indeed, TSPL's compliance of all conditions of the Consent has been endorsed by the relevant authorities such as the PPCB from time to time. The Consent only contemplates the retrofitting of any FGD system if required. It is abundantly clear that as on the Cut-Off date, an FGD system was not required to be fitted in TSPL's contemplated power plant.

PSPCL's reliance on the Hon'ble APTEL's judgment in the case of M/s JSW Energy Limited V/s. Maharashtra State Electricity Distribution Co. Ltd and Another dated 21.01.2013 in Appeal No. 105 of 2011("JSW Case") is wholly erroneous and inapplicable in the

instant matter. The significant facts distinguishing TSPL's case from the JSW case, are as under:-

- a) The clause of TSPL's consent that PSPCL relies on, envisages only the 'retrofitting' of an FGD system 'if required' in contradistinction to its 'installation' as applicable in the JSW Case. Similarly, the environmental protection measures envisaged by clause (xxv) of TSPL's Consent were only those measures that had to be complied with at the time the clearance was granted, not any measures introduced in future ad infinitum.
 - b) TSPL would like to underscore that it has complied with all environmental protection measures contemplated by the Consent granted to it. Therefore, TSPL is fully cognizant of its obligations under the Consent, and categorically states that the de novo installation of a new FGD system and other systems clearly falls beyond the ambit of the Consent. Hence, the JSW Case has no application whatsoever in the present case.
- v) PSPCL cannot be permitted to cherry-pick data convenient to it in order to escape its contractual obligations under Article 13 of the PPA. The SO₂ emission values that have to be considered for ascertaining the full impact of the Notification are as under:
- a) 1565 mg/Nm³ for design coal of 34% ash, 0.45% Sulphur; and
 - b) 2012 mg/ Nm³ for worst coal of 34% ash, 0.50% Sulphur.

Stray or instantaneous values measured at various fuel/ firing/ loading conditions etc. cannot be made the basis for estimating the emission levels. The earlier emission data, varying between 599.67mg/Nm³ and 1769.6 mg/ Nm³ and collected through spot sampling at stack sampling point under different loads, coal composition & process parameters, calculated on instantaneous basis, is not relevant for the instant Petition. Further, the emission levels of 500-900 mg/Nm³ as has been mentioned by PSPCL cannot be achieved consistently at different loads, different fuel firing at different coal (design/ worst) etc. The governing principle with which TSPL has envisaged the installation of new equipment is to ensure such equipment is capable of continuously complying with the emission limits mentioned in the Notification and applicable environmental laws in all conditions that a power plant such as TSPL's is faced with as per experience in the industry.

- vi) PSPCL's assertions as to the incorrectness of the Feasibility Report are erroneous and wholly unfounded. The Feasibility Report was prepared by a highly reputed technical agency that is experienced in these matters i.e. Tata Consultancy Engineering, after a thorough and detailed consideration of all the available information and after taking into account the fuel parameters/load conditions etc. that typically prevail in power plants. Indeed, the report was shared with PSPCL for its inputs, and PSPCL's inputs were factored into its preparation. In a surprising volte face, perhaps to escape its contractual obligation to compensate TSPL under Article 13 of the

PPA, PSPCL has now disowned and denied the Feasibility Report in its entirety. In the reply, there is no assertion as to the competence or credibility of Tata Consultancy Engineering by PSPCL, therefore, undeniably the competency of the technical agency appointed by TSPL is admitted by PSPCL.

- vii) PSPCL's argument that TSPL has the requisite combustion technology to bring the nitrogen oxide levels down to 300 Mg/Nm³ reflects a complete lack of understanding of the manner in which power plants operate, and is simply a means to escape its contractual liability. PSPCL's assertions lose sight of the fact that coal samples with different ash content and different calorific values can greatly vary the firing rates and consequently the NO_x emissions. Changes in load conditions also greatly impact the same. The divergence between NO_x levels from 175 Mg/Nm³ to 482 Mg/Nm³ cannot be given much credence, in light of the fact that emission levels vary greatly in accordance with the factors outlined above. The Feasibility Report has considered NO_x level at 385 Mg/Nm³ at partial loading after taking into account the impact of Combustion Control Technologies of low NO_x burners with supply of over fire air through the Closed Coupled Overfire Air ("COFA") as well as Separated Over Fire Air ("SOFA"). Without fine-tuning the COFA and SOFA, the NO_x emission levels are as high as 633 mg/nm³. As a result, installation of SNCR is a mandatory prerequisite to bring the NO_x levels down to comply with the standards set by the Notification.
- viii) The Notification amounts to a Change in Law event and prior in-principle approval of the resultant compensation due to TSPL is

critical for TSPL to tie up adequate financing arrangements to ensure the timely availability of funds to implement the technology necessitated by the Notification. In the absence of the Commission's prior approval, TSPL's compliance with the Notification would not be possible or financially feasible. The exact financial figures and impact of the Change in Law shall be available once TSPL is enabled to call for tenders and initiate the detailed engineering phase for installation of requisite equipment, post the Commission's in-principle approval.

- ix) It is denied that TSPL has not computed and set forth the change in law expenses under each head; the same have been set forth in the Feasibility Report that was conveyed to PSPCL vide letter dated 23.06.2017. The expenses which have been claimed are only those that are exclusively attributable to the change in law event, and no other expenses.
- x) The relevant clauses in the environmental clearance as per which the obligation to monitor was imposed on TSPL are given hereunder:

"...A Bi-flue stack of 275m height shall be provided with continuous online monitoring equipment for SO_x, NO_x and particulate. Exit velocity of flue gases shall not be less than 25m/sec."

"Regular monitoring of ground level concentration of SO₂, NO_x, SPM and RSPM shall be carried out in impact zone and records maintained –By implementing ambient air quality stations and ensuring all ground level concentration of above matters are within limit as per norms and clearance conditions..."

The above conditions were duly complied with by TSPL by putting in place the necessary infrastructure to monitor its emission levels. Notwithstanding the same, the fact that TSPL was required to monitor

emission levels, cannot be the basis for PSPCL to contend that TSPL should have envisaged a drastic reduction in the permissible emission levels. Further, PSPCL's assertion that the emission levels for NOx prescribed in the Notification must have been prescribed in some or the other clearance is nothing but a shot in the dark and denied as a blatant attempt at a fishing and roving inquiry to deny and delay TSPL's entitlement to Change in Law relief.

- xi) The Hon'ble APTEL has categorically held that it is PSPCL's obligation to arrange fuel of adequate quantity and quality for the Project. The Feasibility Report is premised on the ash content of coal being 34% and the sulphur content being 0.5% only, so no fault can be found with it in that respect.
- xii) PSPCL's assertion that there has been no change in the size of the FGD system in the Feasibility Report compared to an earlier draft version despite a change in estimated SO₂ emissions cannot be countenanced. A tabular representation of the changes are outlined below:

Particulars	Draft feasibility report submitted vide letter dated 12.01.2017 with SO ₂ emission value at 2738	Final Feasibility report submitted vide letter dated 23.06.2017 with SO ₂ emission value at 2012	Reference
Estimated SO ₂ emission rate at ID Fan outlet (TPH)	6.092	4.65	-
Estimated lime stone consumption for FGD (TPH)	12	8.65	Appendix-4
Estimated by product i.e. Gypsum (TPH)	20.52	15.05	

A perusal of the above clearly indicates that the input design parameters in accordance with which the FGD system has to be designed have been clearly changed in light of a change in estimated SO₂ emission levels. Thus, PSPCL's assertion that the size of the FGD system remains the same despite the change in SO₂ emission estimates is denied as wrong as the size of the FGD system will get changed with the estimated emission levels. The cost of limestone is based on estimated ash content of 34% and sulphur content of 0.5%, so these estimates rest on a solid foundation.

- xiii) The NO_x emissions are 572 mg/Nm³ for design coal of 34% ash, 0.45% Sulphur and 633 mg/ Nm³ for worst coal of 34% ash, 0.50% Sulphur. As a result, emission levels of 300mg/NM³, as mandated by the Notification, can in no circumstance be achieved sans the installation of SNCR technology.
- xiv) While the relief that TSPL is claiming is founded upon Article 13 of the PPA, the same has to be read in combination with Article 1.1 in order to understand the full import of the term 'law' and 'Indian Government Instrumentality'. Such a conjoint reading puts it beyond any pale of doubt that the MOEF is an Indian Government Instrumentality and the Notification falls within the ambit of the term 'law' as defined under the PPA. Further, it is reiterated that the Feasibility Report was prepared in the most objective manner possible, and the expenses being projected by TSPL are consonant with prudent utility practices. Further, TSPL has offered to engage in meetings with PSPCL and a joint consultant on several occasions, but PSPCL has not responded to these proposals thus far. That a

meeting for deciding on implementation of FGD and other systems was called by the Northern Regional Power Committee (NRPC) on 14.09.2017. This was in continuation to their earlier meeting on 17.01.2017. As per its letter no. NRPC/OPR/117/012017/ 9791-9856 dated 05.09.2017, the NRPC has been suggesting that Ministry of Power, Government of India has set a deadline of 31.12.2022 for implementing FGD and other systems in the country. According, to the Phasing Plan for implementation of FGD and other systems framed by NRPC, and as recommended by the Central Electricity Authority (CEA), TSPL's Units are to comply with the Notification according to the following timelines:

Unit No. 1- 31.03.2021

Unit No. 2- 31.03.2021

Unit No. 3- 31.12.2020

Going by the above implementation timeline, TSPL needs to start work on the implementation of FGD and other systems at the earliest as a matter of urgent priority. As per the indicative Implementation Plan in the Feasibility Report, a minimum of 18 + 32 months are required from the date of receiving approval from the Commission for firstly, achieving Financial Closure and the implementation of the FGD and other systems. Hence, it is of critical importance that the instant Petition is decided at the earliest and as a matter of priority.

- xv) PSPCL cannot make a bald averment to the effect that the seven heads of charges outlined by it cannot be considered without offering any rationale in support of this assertion. TSPL's explanation as to why each of these charges is claimable is outlined below:

- a) As explained in Feasibility Report, the existing Units are presently equipped with the combustion control technologies of Low NO_x Burners (LNB) with supply of over fire air in the furnace. Only by tuned and coordinated operation of the existing LNBs with regulated supply of optimal amount of excess air, a NO_x reduction efficiency of 45% can be achieved. Thus, it is imperative to hire a competent agency to carry out the necessary studies and to prepare and execute the correct procedure for tuning, minor modifications in burner system, if required as well as to hire Distributed Control System (DCS) / boiler experts to fine tune the system to achieve optimal results.
- b) When estimating the cost for a project, product or investment, there is always uncertainty as to the precise content of all items in the estimate, how work will be performed, what work conditions will be like when the project is executed and so on. Moreover, unforeseen circumstances like delays and exigencies etc. from FGD/ SNCR vendors are expected due to overbooking as all power plants in the thermal power sector in the country are required to set up similar systems. Considering these aspects and also as per general practice of prudent project budget preparations, a prudent contingency cost is to be considered. Engineering and project management services are essential for any project works in order to ensure that the project is executed within timelines, within budgeted cost and with required quality of material supply & workmanship.

- c) Regarding opportunity cost, the installation of FGD and other systems as envisaged by the Notification was not mandated by law at the time of the Cut-Off Date. Hence, the financial loss caused due to the opportunity cost of shutting down each unit for approximately 120 days while installing FGD and SNCR systems must be considered as part of the Change in Law relief owed to TSPL. If the Project had not been required to shut down for 120 days due to the promulgation of the Notification, it would be available to generate power for Punjab and entitled to tariff for such period.
 - d) An increase in the Auxiliary power consumption by new FGD, SNCR and other systems is inevitable and is estimated to be 1.6%. In light of the fact that such enhanced auxiliary power consumption was not in contemplation of the parties as on the Cut-Off Date, the same is attributable to the Notification and entitles the Petitioner to relief under Article 13 of the PPA.
 - e) The installation of FGD, SNCR and other systems will entail a significant expenditure, so PSPCL cannot plausibly argue that the installation phase does not involve any expenditure.
 - f) The so called “alleged” legal and administrative costs are genuine and on account of Change in Law, as such relief cannot be claimed without incurring legal and administrative costs.
- xvi) The Feasibility Report annexed with the captioned Petition is the only report that TSPL relies on to claim Change in Law relief, and

reference to any other version is irrelevant. The final prices of materials being claimed by TSPL, are as have been stated in the Feasibility Report. The amount payable as change in law expenditure meets the criteria of 1% of the aggregate value of the letter of credit in a contract year. In light of the foregoing, it is reiterated that the Notification constitutes change in law and the expenditure flowing from the same be sanctioned under the restitutionary mechanism envisaged under Article 13 of the PPA.

6. The affidavit filed by TSPL in compliance to the Order dated 16.02.2018 to submit the details, in brief, is as under:-

- a) TSPL collectively submitted vide this affidavit the Environmental Clearances obtained by TSPL along with copies of all the compliance reports submitted by TSPL to PPCB from the time of commissioning of the project. No separate acceptance reports have been issued to TSPL by the PPCB, however, on the basis of TSPL's compliance with environmental norms PPCB periodically renews its Consent to Operate, which is effective as on date.
- b) TSPL enclosed with the affidavit the details of parameters achieved by TSPL from commissioning to January, 2018 as per the continuous monitoring system.
- c) The amounts kept in the project for complying with environmental norms are as per the directive of Ministry of Environment.

- d) Adequate space provision for retrofitting of FGD for future propose has already been provided at TSPL's Project at the time of setting up, and is available.
- e) At the time when Talwandi Sabo Power Ltd. was incorporated as a Special Purpose Vehicle ("SPV") and controlled by the erstwhile Punjab State Electricity Board ("PSEB") had applied for Environmental Clearance and submitted all supporting documents including Rapid Environmental Impact Assessment ("EIA") Report. Further, in the EIA report and Proceedings of the public hearing conducted on 29.01.2008, environmental protection measures were set out. Subsequently, MoEF had granted Environmental Clearance to TSPL (when it was an SPV of PSEB) on 11.07.2008 and mentioned total project cost as Rs. 8000 crore which includes Rs.461 crore for environmental protection measures. Separate funds have been allocated for implementation of environmental protection measures as part of the original project cost. A sum of Rs.1204 Crore has already been spent on implementation of environmental protection measures, which is more than (Rs. 461 crore) committed by PSPCL to MoEF & CC, New Delhi. TSPL further provided a year wise & item wise break-up of the Rs.1204 crore spent on environmental protection measures.
- f) TSPL provided copies of communications received from Central Pollution Control Board ("CPCB") dated 11.12.2017, 13.02.2018 and TSPL's communication to CPCB dated 11.01.2018.

7. The submissions of PSPCL to the affidavit filed by TSPL on 26.03.2018, in brief, are as under:-

- i) The Commission directed TSPL to file the Environmental Clearances obtained by TSPL. While TSPL has filed the Environmental Clearance dated 11.07.2008, there have been subsequent clearances imposing additional conditions which is clear from the Compliance Reports, including but not limited to Additional Conditions dated 25.03.2010, 17.06.2010 and 06.04.2011. TSPL is required to file all the environmental clearances and consents given to TSPL's project prior to the Amendment in Environmental Norms to consider the aspect of change in law.
- ii) TSPL has filed the Compliance Reports submitted to PPCB or other authorities without the annexures to the said reports. The complete report is required to be filed, in particular, Annexure-1, Annexure-5, the reports and information on emissions.
- iii) The Renewal of Consents from PPCB refer to a Show Cause Notice dated 16.03.2016 and the action plan submitted by TSPL on 21.03.2016. TSPL may be asked to clarify the issue in the said Show Cause Notice and in particular whether the same related to emissions.
- iv) TSPL has submitted the details achieved by TSPL from commissioning to January 2018 as per Continuous Emissions Monitoring System in the form of a Table. The emissions in the said table vary greatly from the Stack Monitoring data submitted by TSPL to PSPCL with Letter dated 18.03.2017 and which is the data

reported to Punjab Pollution Control Board. PSPCL requested that TSPL may be asked to produce the Report directly from the Server of CEMS instead of collating the data on its own.

- v) A comparison of the Emissions as per CEMS data now submitted and the Stack Monitoring Data for SO₂ (in mg/Nm³) is as under:

Month	Unit 1		Unit 2		Unit 3	
	CEMS	Stack Monitoring Data	CEMS	Stack Monitoring Data	CEMS	Stack Monitoring Data
Dec-14	-	-	1143	813.12	-	-
Jan-15	-	-	1900	1769.6	-	-
Feb-15	-	-	1274	1683.92	-	-
Mar-15	-	-	1274	1682.8	-	-
Apr-15	-	-	1470	1671.6	-	-
May-15	-	-	1470	1646.4	-	-
Jun-15	-	-	1755	1162.14	-	-
Jul-15	-	-	1292	1143.12	-	-
Aug-15	-	-	1384	1151.08	-	-
Sep-15	-	-	1291	943.49	-	-
Oct-15	-	-	1332	982.91	-	-
Nov-15	-	-	1351	1012.31	-	-
Dec-15	-	-	1363	599.67	1694	750.12
Jan-16	-	-	1987	652.96	1419	-
Feb-16	-	-	1171	513.47	1006	-
Mar-16	-	-	1873	637.29	-	-
Apr-16	-	-	1894	-	1165	-
May-16	-	-	1712	-	1843	-
Jun-16	-	-	1113	-	1830	-
Jul-16	-	-	1284	-	1425	-
Aug-16	-	-	1199	792	1217	742
Sep-16	-	722	-	951	1345	724
Oct-16	-	702	1511	718	1110	687
Nov-16	-	744	1795	919	981	704
Dec-16	-	712	1747	962.80	1221	881.3
Jan-17	1160	1025.8	2020	1132.90	1316	1525.1
Feb-17	1420	-	1776	-	1881	-
Mar-17	1046	-	1640	-	1313	-
Apr-17	965	-	1206	-	1468	-

May-17	-	-	-	-	-	-
Jun-17	959	-	1199	-	1322	-
Jul-17	1286	-	1484	-	1569	-
Aug-17	953	-	1190	-	1697	-
Sep-17	-	-	-	-	1338	-
Oct-17	1191	-	1489	-	1672	-
Nov-17	1284	-	1600	-	1825	-
Dec-17	1349	-	1687	-	2063	-
Jan-18	1314	-	1673	-	1909	-

It is also not clear how the emissions as per CEMS are so much higher than other data.

- vi) The Feasibility Report submitted by TSPL has considered the existing SO₂ Emission at 2012 mg/NM³ which has to be reduced to 200 mg/NM³. As is clear from the CEMS, most of the time, the SO₂ is much lower than 2000 mg/NM³ and as per the Stack Monitoring Data, the existing emissions vary between 599.67 mg/NM³ to 1769.60 mg/NM³.
- vii) There is a great variance in the SO₂ which has not been explained by TSPL. If it is possible for TSPL to achieve emission levels of 500 to 900 mg/NM³, then why does the emission go up to 1769 mg/NM³ or 2000 mg/NM³. Further, if it is possible for TSPL to control the emission to a lower amount, the capacity of FGD required can be significantly reduced.
- viii) In the earlier Feasibility Reports submitted to PSPCL, the emission for SO₂ was considered at 2906 mg/NM³ or more. PSPCL had objected that the Report considered coal of higher than 0.5% Sulphur content, which was prohibited to TSPL. Thereafter, the Feasibility

Report has been rectified; however the same efficiency of FGD is being considered in the present report. This shows that the TSPL is seeking a higher capacity of FGD than needed.

- ix) A comparison of the Emissions as per CEMS data now submitted and the Stack Emissions data for NO_x (in mg/Nm³) is as under:

Month	Unit 1		Unit 2		Unit 3	
	CEMS	Stack Monitoring Data	CEMS	Stack Monitoring Data	CEMS	Stack Monitoring Data
Dec-14	-	-	-	229.62	-	-
Jan-15	-	-	603	474	-	-
Feb-15	-	-	-	337	-	-
Mar-15	-	-	358	329.6	-	-
Apr-15	-	-	361	318.8	-	-
May-15	-	-	495	325.6	-	-
Jun-15	-	-	551	288.78	-	-
Jul-15	-	-	381	274.86	-	-
Aug-15	-	-	-	263.40	-	-
Sep-15	-	-	518	360.32	-	-
Oct-15	-	-	525	310.58	-	-
Nov-15	-	-	544	353.68	-	-
Dec-15	-	-	519	418.91	640	435.72
Jan-16	-	-	466	223.7	561	412.8
Feb-16	-	-	-	175.28	599	464.52
Mar-16	-	-	504	285.18	-	371.7
Apr-16	-	-	384	-	507	-
May-16	-	-	352	-	549	-
Jun-16	-	-	-	-	534	-
Jul-16	-	-	-	-	410	-
Aug-16	-	-	-	244	444	426
Sep-16	-	482	-	222	462	473
Oct-16	-	270	394	304	428	326
Nov-16	-	394	381	303	481	358
Dec-16	-	349.65	785	410	434	386.7
Jan-17	376	256.1	403	325.2	431	366.1
Feb-17	-	-	405	-	494	-
Mar-17	391	-	490	-	-	-
Apr-17	-	-	-	-	435	-

May-17	-	-	-	-	-	-
Jun-17	-	-	-	-	-	-
Jul-17	755	-	737	-	638	-
Aug-17	531	-	664	-	646	-
Sep-17	-	-	464	-	585	-
Oct-17	417	-	641	-	651	-
Nov-17	389	-	598	-	674	-
Dec-17	421	-	649	-	665	-
Jan-18	404	-	641	-	689	-

- x) The CEMS considers the NO_x emission at significantly higher levels than the stack monitoring data. It is also not clear how the emissions as per CEMS are so much higher than other data.
- xi) The Feasibility Report has considered the NO_x at 385 mg/NM₃ (at partial load) after combustion tuning etc, which has to be reduced to 300 mg/NM₃. From the Stack Monitoring data, the emission of NO_x is varying from 175 to 482. With Combustion control, the emissions can be reduced by 40% i.e. 105 to 290.4 mg/NM₃. This is also clear from the PPCB letter dated 11.12.2017 which refers to low NO_x burners providing Over Fire Air etc to achieve the reduction in NO_x .
- xii) Further there is no explanation for variation in the NO_x. If it is possible for TSPL to control the emission to within 300 mg/NM₃ either by itself or through combustion control, it may not need any additional equipment and even if TSPL can control it close to 300 mg/NM₃, the capacity of SNCR required can be significantly reduced.
- xiii) TSPL submitted item wise break up of costs wherein the annual expenditure is provided as per estimates (allocated on time basis). It is not clear why the data for annual expenditure is provided on estimate basis and not on actual basis when the data was prepared

on 23.03.2018. Further, TSPL has not submitted the total funds earmarked for environment protection measures and balance amount (if any) available with them.

- xiv) TSPL has not provided for funds for FGD; however the same cannot be used to justify its claim that the FGD was not envisaged in the original Environment Clearance. It is the obligation of TSPL to comply with the terms and conditions of the Environment Clearance and any failure on part of TSPL to do so cannot be a reason to claim that such condition was not part of the Environment Clearance.
- xv) TSPL has submitted the average emission value for Sulphur Dioxide and Nitrogen Oxide for CEA which is the same for all the units. This is not possible. It is therefore clear that the data submitted to CEA is not actual. Further the values for SO₂ (in mg/Nm³) do not match the CEMS data or Stack Monitoring Data:

Year	Unit	CEA	CEMS	Stack Monitoring Data
2014-15	Unit 2	1517	1397.75* (Average of 4 months)	1487.36* (Average of 4 months)
2015-16	Unit 2	1632	1478.25	1009.70
	Unit 3	1631	1373* (Average of 3 months)	750.12 (Data for one month)
2016-17	Unit 1	1617	1208.67* (Average of 3 months)	781.16 (Average of 5 months)
	Unit 2	1617	1608.27* (Average of 11 months)	912.61* (Average of 6months)
	Unit 3	1617	1387.25* (Average of 11 months)	877.23*(Average of 6 months)

Thus, it is not clear on what basis the data was sent to CEA. The recommendation of CEA would be therefore based on higher emissions than actual or even considered in the Feasibility Report. This can affect the selection of technology for FGD, it's size, capacity and consequently cost of the FGD to be considered.

- xvi) The data for NOX (in mg/Nm³) also does not match the CEMS data or Stack Monitoring data:

Year	Unit	CEA	CEMS	Stack Monitoring Data
2014-15	Unit 2	506	480* (Average of 2 months)	342.55* (Average of 4 months)
2015-16	Unit 2	567	486.40* (Average of 10 months)	299.92
	Unit 3	567.3	600* (Average of 3 months)	421.18* (Average of 4 months)
2016-17	Unit 1	600.5	383.5* (Average of 2 months)	350.35* (Average of 5 months)
	Unit 2	600	449.25* (Average of 8 months)	301.36* (Average of 6 months)
	Unit 3	600	470.36* (Average of 11 months)	389.3* (Average of 6 months)

It is not clear on what basis TSPL has submitted the information to CEA. Further, the emissions values submitted to CEA for the units are similar even though the actual vary. It is therefore clear that the data submitted to CEA is not actual. The recommendation of CEA would be therefore based on higher emissions than actual which would affect the advice by CEA.

- xvii) TSPL has submitted a Test Report by SGS India Private Ltd alongwith the Letter dated 25.01.2018 to the CEA for analysis of Flue Gases wherein TSPL has submitted as under:
- a) SO₂ – 2336.30 mg/NM³
 - b) NO_x – 400.50 mg/NM³
- xviii) The above emissions do not match the earlier data to CEA or the CEMS or the stack monitoring data. TSPL has submitted varying data on emissions to the CEA and it is not clear on what basis such data is being submitted. Since the advise of CEA is dependent on such data, submissions of wrong data by TSPL would render any advise by CEA infructuous.

xix) As per the Feasibility Report in January 2018, TSPL is seeking to construct a new chimney. However, TSPL is still seeking lining work in the old chimney; the reason for which is not clear. It is brought on record that despite the new chimney, the capital cost of installing FGD & SNCR system has reduced from Rs. 1.53 crore per MW to Rs. 1.19 crore per MW.

8. The submissions of TSPL to the reply dated 27.04.2018 filed by PSPCL, in brief, are as under-

i) The additional information of the amended environmental clearances is furnished as under:

Sl. No.	Document	Date	Annexure	Remarks
1.	EC amendment	25.03.2010	Annexure-A	1.Change in configuration from 2000 MW (4x250 MW) to 1980 MW (3x660 MW) 2. Upload EC compliance report on website and submission of report by e-mail to MoEF, Regional office. 3. Criteria pollutants from Stack & ambient air shall be regularly monitored and results displayed in company website and also at the main gate of the power plant.
2.	EC amendment	17.06.2010	Annexure-B	1.The word "Super-Critical" added after 3x660 MW. 2."Bi-Flue" replaced by Tri-Flue in condition no.(iv) of EC.
3.	MoEF&CC office memorandum	06.04.2011	Annexure-C	Ministry of Environment & Forests has stipulated conditions (similar to conditions mentioned in TSPL EC dated 11-Jul-2008) for all mega power projects namely coal based thermal power plants with capacity of 500 MW and above etc. through office memorandum dated 06/04/2011.

Further, TSPL has already submitted all consents granted by PPCB prior to the Amendment in Environmental Norms vide our letter no. TSPL/PSERC/AK/MAR-18/60 dated 26.3.2018 to PSERC& PSPCL.

From the above details, it is abundantly clear that no additional conditions have been imposed on TSPL as suggested by PSPCL, which have any bearing on the implementation of FGD as per Article 13 of the PPA.

- ii) TSPL has already submitted details of Annexure-1 of EC compliance Report i.e. Stack emissions data along with monthly test reports from October, 2014 - January, 2017 to PSPCL vide letter TSPL/PSPCL/TD/AM/MAR-17/45 dated 18.03.2017. Monthly test reports of EC compliance report from October, 2014 – March'2015 period to October'2017- March'2018 period were also resubmitted.

Regarding Annexure-5 of EC compliance report, TSPL has submitted the same to MOEF &CC, CPCB and PPCB along with half yearly Environmental clearance compliance report from October'2014 - March'2015 period to October'2017 - March'2018 period at the relevant time of submission and was also resubmitted to the Commission.

In the earlier submissions (till September,2017) for Annexure-5, TSPL has detailed only operational expenditure towards environmental protection measures post commissioning of 1st Unit and not the project Capital expenditure incurred till commissioning of the Units (except for some minor capex items as mentioned). TSPL had already submitted to PSPCL and to the Commission vide Annexure-C of letter no. TSPL/PSERC/AK/MAR-18/60 dated 26.3.2018, the details of project expenditure done for implementation of environmental protection measures. Brief details of Annexure-1 & Annexure-5 of EC compliance report is being furnished herein below:

Sl. No.	Report	Period	Annexure No.1 now attached as	Annexure No.5 now attached as	Remarks
1.	Half yearly Environmental Clearance compliance report	April, 2013 to September, 2013	----	----	Unit not commissioned.
2	Half yearly Environmental Clearance compliance report	October, 2013 to March, 2014	----	----	Unit not commissioned.
3	Half yearly Environmental Clearance compliance report	April, 2014 to September, 2014	Data not submitted		Unit-2 was commissioned on 5.7.2014 & then got stopped due to coal non-availability etc. Then it started again in October, 2014.
4	Half yearly Environmental Clearance compliance report	October, 2014 to March, 2015	Annexure-D1	Annexure-E1	Annexure-5 submitted.
5	Half yearly Environmental Clearance compliance report	April, 2015 to September, 2015	Annexure- D2		Not required to submit Annexure-5. As per the EC condition, expenditure to be submitted on yearly basis
6	Half yearly Environmental Clearance compliance report	October, 2015 to March, 2016	Annexure- D3	Annexure-E2	Annexure-5 submitted.
7	Half yearly Environmental Clearance compliance report	April, 2016 to September, 2016	Annexure- D4		Not required to submit Annexure-5. As per the EC condition, expenditure to be submitted on yearly basis
8	Half yearly Environmental Clearance compliance report	October, 2016 to March, 2017	Annexure-D5	Annexure-E3	Annexure-5 submitted.
9	Half yearly Environmental Clearance compliance report	April, 2017 to September, 2017	Annexure-D6		Not required to submit Annexure-5. As per the EC condition, expenditure to

					be submitted on yearly basis
10	Half yearly Environmental Clearance compliance report	October, 2017 to March, 2018	Annexure-D7	Annexure-E4	Annexure-5 submitted.

- iii) The observations given in the Show Cause Notice are related to points raised by PPCB on one time issues observed by them during their site visit. All the points and their compliance status have been tabulated below. Based on the compliance, TSPL has been issued renewal of Consent to Operate by Punjab State Pollution control Board (PPCB). It would suffice to submit that the said Show Cause Notice has no bearing whatsoever on the Change in Law being considered by the Commission as part of the instant Petition.

Sl. No.	Observation	Compliance status
1.	The industry has provided bag house filters as APCD with each wagon tippler separately, to contain the emissions and has provided adequate stack with it, but no sampling arrangements have been provided adequate to facilitate collection of air emissions samples.	Complied and the compliance status submitted to PPCB, Regional Office vide letter No. TSPL/ENV/02/PPCB/296 dated 15/3/2017
2.	The industry has provided bag house as APCD with each coal crusher, However the industry has not provided stacks of adequate height with these bag houses. Further, the industry has not provided adequate sampling arrangements to facilitate the collection of air emission samples.	Complied and the compliance status submitted to PPCB, Regional Office vide letter No. TSPL/ENV/02/PPCB/296 dated 15/3/2017
3	The transfer points are equipped with bag house filters as APCDs, However stacks of adequate height as well as sampling arrangements have not been provided to facilitate collection of emission samples.	
4.	The industry has provided stack of 275 meter height of each boiler for discharge of air emissions into atmosphere, however the industry has not provided proper and safe arrangements to each stack to collect the air emission samples. As per the online data checked at the time of visit, concentration of SPM in the stack of First Unit (Unit no. II) was in range of 400 mg/Nm ³ and thick smoke was being emitted from stack and the concentration of SPM in the stack of Second unit (Unit no. III) was in range of 50 mg/Nm ³ . The industry thus failed to achieve the prescribed SPM limit of	Complied and the compliance status submitted to PPCB, Regional Office vide letter No. TSPL/ENV/02/PPCB/296 dated 15/3/2017

	50 mg/Nm ³ in case of First Unit (Unit no. II)	
6	The industry is required to develop greenbelt in an area of 550 acres as on 31.3.2016 as per the tentative time schedule approved by the competent authority of the Board, however the industry has developed a greenbelt in different segments, Further, the industry has not developed greenbelt all along the boundary and within in its premises in different segments. Further, the industry has not developed greenbelt all along the boundary in compliance to the condition of consent to operate granted under the Air Act, 1981	Complied and the compliance status submitted to PPCB, Regional Office vide letter No. TSPL/ENV/02/PPCB/296 dated 15/3/2017.
7	The representatives of industry claimed that treated wastewater of DM plant and back wash is reused in DM plant, however they failed to show the same as the pipelines carrying treated wastewater water not visible	Complied and the compliance status submitted to PPCB, Regional Office vide letter No. TSPL/ENV/02/PPCB/296 dated 15/3/2017
8	The industry has provided ETP of capacity 440 Kl/year, consisting of high rate Solid Contact Clarifiers, thickener, centrifuge, clarifier, dual media filters, ultra-filtration systems with two stage ROs. The industry claimed that the treated wastewater after removing impurities is reused for cooling purposes and as such it is ZLD plant, however the industry has failed to show the distribution network of the treated wastewater	
9	The industry generates wastewater from oil storage tanks blow down, which is collected in oil wastewater pond. The industry has provided oil separator system for separation of oil and water. However, the industry is not maintaining any record for operation of this separation system and was collecting the wastewater from such streams in an underground tank and its further disposal is not clear	
10	The industry has installed two modules of STPs of capacity 15 KLD and the representatives of industry claimed that the wastewater of administrative block is treated in these STP's .However, no effluent was observed coming in these STP's and also there was no outlet from these STPs. The domestic wastewater generating from old administrative building and transit hostel is discharged	Complied.
11	The industry has installed three no silos for storage of fly ash and huge quantity of fly ash was lying scattered all around/ near to these silos. The fly ash was becoming air born due to movement of trucks & other vehicles and was causing nuisance within the area.	Complied and the compliance status submitted to PPCB, Regional Office vide letter No. TSPL/ENV/02/PPCB/296 dated 15/3/2017
12	The industry has not provided pacca roads within its total premises for movement of vehicles so as to visit such type of unit smoothly	Complied and the compliance status submitted to PPCB, Regional Office vide letter No. TSPL/ENV/02/PPCB/296 dated 15/3/2017
13	The industry has stored huge quantity of waste/used oil drums in open drums in open	Complied and the compliance status submitted to PPCB, Regional Office

	(which is hazardous waste category 5.1 of schedule-I) and as such the industry is not complying the provisions of (hazardous waste (Management, Handling and Transboundary Movement) Rules, 2008	vide letter No. TSPL/ENV/02/PPCB/296 dated 15/3/2017
14	The industry has not provide a proper approach to ash dykes and has not developed a proper greenbelt around the ash dyke area	Complied and the compliance status submitted to PPCB, Regional Office vide letter No. TSPL/ENV/02/PPCB/296 dated 15/3/2017
15	The industry has not installed piezometers, specifically around the ash dyke area at required depth (first aquifer) so as to collect the ground water samples for analysis of ground water quality	Complied and the compliance status submitted to PPCB, Regional Office vide letter No. TSPL/ENV/02/PPCB/296 dated 15/3/2017.

- iv) It is denied that the Petitioner is seeking to install an FGD of a size larger than required. The petitioner shall only install a system based on approved benchmark norms and cost by the Central Electricity Authority (“CEA”) and the Commission. CEMS continuously monitors SO₂ & NO_x data and the data is being maintained on an hourly average basis. Thus, the values of instantaneous monitoring done in stack monitoring data and average data collected by CEMS would naturally vary.

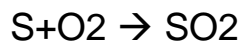
As pointed out by PSPCL, the report of SO₂ & NO_x directly captured from CEMS server in a Compact Disc submitted to the Commission. It is pertinent to mention that CEMS data has varied on some occasions due to disturbance in sampling conditions such as sample filter choking, sample tube leakage issues, sample heater malfunctioning, DCS cable signalling issues, combustion stability issues during Units start-up & shutdown periods, etc. and analyser calibration issues on certain occasions. This has resulted into difference in CEMS data on some occasions, as compared to the values as observed through stack monitoring data and calculated values as per actual Sulphur in coal, coal firing rate & load conditions.

In order to take care of erroneous values, the highest value of daily CEMS average has been taken as representative value for the respective month as submitted as CEMS value earlier vide our letter no. TSPL/PSERC/AK/MAR-18/60 dated 26.3.2018 as Annexure-B (Part-1) & Annexure-B (Part-2). The daily average and maximum SO₂ & NO_x data along with remarks indicating disturbance in sampling conditions were also enclosed.

Instead of only referring & analysing instantaneous values measured through Stack monitoring data & CEMS values captured at various fuel/ firing/ loading conditions & sampling conditions in the past, it is prudent to compare the calculated value of SO₂ emissions for input coal of 34% ash and 0.45% to 0.5% Sulphur content as mentioned in Final Feasibility Report dated 04.01.2018 against the other values of CEMS or Stack monitoring values etc. Calculated values of SO₂ emission are 1565 mg/Nm³ for coal of 34% ash & 0.45% Sulphur and 2012 mg/ Nm³ for Performance coal of 34% ash, 0.50% Sulphur. As is the prudent engineering practise, calculated values for worst coal are always considered for designing a system so that no violation of new emission norms may occur at any operating conditions post FGD etc. implementation and the same is recommended by CEA also in their report stating that engineering aspects of FGD shall be to limit SO₂ below environmental norms as per worst coal data:

- a) Regarding SO₂ emission, we have considered the following calculations:

Based on Stoichio metric calculations of the below reaction,



- 1 Kg of S combustion generates about 1.9978 kg of SO₂

- 1 Kg of S combustion generates about 2.497 kg of SO₃
- Rate of Sulphur (S) fired into furnace = (Firing rate of coal) x (% Sulphur present in coal)
- Rate of SO₂ generated in the furnace = (Rate of Sulphur fired) x 1.9978
- Emissions in mg/Nm³ at 6% O₂ = (Rate of Sulphur Emission x Flue Gas Flow rate at stack) x (20.9-6) / (20.9 - actual O₂) where 20.9 is Oxygen % at sea level.

Calculation sheet of SO₂ emission at TSPL:

Sl. No	Description	Formulae used in TSPL Calculations of SO _X	UOM	Value- TSPL (660MW) @ 34% ash & 0.5% Sulphur Performance coal	Guarantee Value- NTPC Vindhychal StageV-1X500 MW #	Value- TSPL (660MW) @ 45% ash & 0.6% Sulphur worst coal for FGD design
A	Fuel Firing Rate	A	TPH	428	397.3	508.2
B	Sulphur in Fuel	B	%	0.5	0.49%	0.6
C	Estimated Total Wet Flue Gas Flow Rate at ID Fan Outlet	C	Nm ³ /Sec	671.302	565.6	----
D	Estimated Total Wet Flue Gas Flow Rate at ID Fan Outlet	D	Nm ³ /h	2416686	2036160	2349483
E	Estimated Total Dry Flue Gas Flow Rate at ID Fan Outlet	E	Nm ³ /h	1998532	-----	2092838
F	Estimated SO ₂ generated at boiler (99% of Sulphur in coal shall form SO ₂ in boiler)	$F = 1.9978 * A * B \% * 99\%$	TPH	4.233	----	6.031
G	Estimated SO ₃ generated at boiler (shall be in range of 1%; Part of SO ₃ generated in boiler shall precipitate along with fly ash &	$G = 2.497 * A * B \% * 1\%$	TPH	0.053	----	0.076

b	rest portion passes through flue gas at stack)					
H	Calculated SO ₂ & SO ₃ generation at boiler A	H=F+G	TPH	4.286	-----	6.107
I	Estimated SO ₂ Emission Concentration at ID Fan outlet and Full load (Wet basis)	$I = F \cdot 10^9 / D \cdot (20.9 - 6) / (20.9 - 5.06)$	mg/Nm ³ at 6% O ₂ , Wet Basis	1647	1912	2415
J	Estimated SO ₂ & SO ₃ concentration at boiler and Full load (Dry basis)	$J = H \cdot 10^9 / E \cdot (20.9 - 6) / (20.9 - 5.06)$		2017		2745
K	Estimated SO ₂ Emission Concentration at ID Fan outlet and Full load (Dry basis)	$J = F \cdot 10^9 / E \cdot (20.9 - 6) / (20.9 - 5.06)$	mg/Nm ³ at 6% O ₂ , Dry Basis	1992		2711

EF & CC latest draft amendment dated 16th October 2017, all monitored values for SO₂ and NO_x shall be corrected to 6% Oxygen, on dry basis. Based on the above table, the calculated value of SO₂ for coal of 34% ash & 0.5% Sulphur content is derived as 1992 mg/Nm³ on dry basis, corrected to 6% Oxygen. Even though TSPL shall use 34% ash (Quarterly basis) & 0.5% Sulphur content coal, we need to keep some flexibility in firing range while designing the FGD. For worst coal considered in original boiler design by EPC contractor, the SO₂ emission value estimated as per above calculations shall be 2711 mg/Nm³ for the worst coal of 45% ash & 0.6% Sulphur content. Considering the flexibility in boiler firing range for

lifetime of power plant and also to meet MOEF norms on emission throughout the lifetime operation of power plant, it is required to keep the SO₂ emission value of 2711mg/Nm³ for designing FGD system for boiler - worst coal condition. However, as per inputs of PSPCL given earlier, TSPL has considered the SO₂ emission value of 2012 mg/Nm³ as per above calculations done for 34% ash & 0.5% Sulphur content coal considering that 100% Sulphur of coal shall be converted into SO₂ in boiler. However, considering the fact that SO₃ shall also be generated in boiler at a maximum trace of 1% level, we have revised the calculations of SO₂ emission concentration at ID fan outlet as per above table that is derived to 1992 mg/Nm³ by using 34% ash & 0.5% Sulphur content coal.

- c) It is pertinent to mention that ensuring the emission range within this SO₂ emission concentration limit of 1992 mg/Nm³ at ID fan outlet throughout the plant lifetime is also a challenging task for TSPL as the coal from its coal supplier Mahanadi Coalfields Limited ("MCL"), even after washing, will not be of uniform quality of 34% ash content (even when TSPL shall maintain 34% ash on quarterly basis). Further, as mentioned above, the technical specification data for NTPC Vindhyachal-Stage V also corroborates that they have also considered the inlet SO₂ (wet basis) as 1912 mg/Nm³ for worst coal for their 500MW power plant against TSPL considered inlet SO₂ (wet basis) of 2415 mg/Nm³ which is matching proportionately with respect to plant capacity. Thus, performance coal value of SO₂

emission as 1992 mg/Nm³ for OPEX purposes & worst coal value of SO₂ emission as 2711 mg/Nm³ for FGD design purpose has been arrived at. Even though SO₂ emission value for FGD design shall be kept at 2711mg/Nm³ for worst coal of 45% ash & 0.6% Sulphur content to meet up the worst scenario of coal availability from MCL, we shall maintain the SO₂ emission value of 1992 mg/Nm³ at ID fan outlet with performance coal of 34% ash & 0.5% Sulphur content.

- d) TSPL has also deputed a MoEF & CC recognised third party agency, SGS India, for conducting Flue Gas composition test and stack monitoring with calibrated portable Flue gas analyser for all 3 Units and the reports of Flue gas composition tests and stack monitoring have been enclosed for perusal of PSPCL and the Commission. The Flue Gas composition test reports have been requisitioned by CEA vide their letter No.44/FGD/UMPP/CEA/2017 dated 09.10.2017 keeping in mind the high accuracy of test results for concluding technology recommendation. The summary of flue gas composition test results and daily stack monitoring with calibrated portable Flue gas analyser of SO₂ & NO_x have been given as under:

Summary of Flue Gas composition test

Date of sampling	Unit# No.	Load (MW)	SO ₂ (mg/Nm ³)	NO _x (mg/Nm ³)
30-04-2018	1	640	1396.39	646.3
27-03-2018	3	650	1501	392
07-03-2018	3	640	1624	384

14-02-2018	3	660	1602	398
14-02-2018	2	643	1596	400
09-02-2018	3	655	1677	452
07-02-2018	2	652	1710	418
03-02-2018	2	660	1573	410
30-01-2018	1	655	1561	426
30-01-2018	2	660	1573	439
29-01-2018	1	619	1627	393
27-01-2018	3	620	1604	405
28-11-2017	1	608	2336	400

Summary of Stack monitoring

Date of Sampling	Unit# No.	Load (MW)	SO ₂ (mg/Nm ³)	NO _x (mg/Nm ³)
22-11-2017	2	650	1896	-
22-11-2017	1	670	1867	-
22-11-2017	3	660	1964	-
28-11-2017	1	608	2335	400
28-11-2017	3	346	2094	336
28-11-2017	2	370	2066	386
30-11-2017	3	390	1897	320
30-11-2017	1		1958	375
30-11-2017	2	432	2047	301
12-01-2017	2	390	1913	339
12-01-2017	1	350	2078	415
12-01-2017	3	370	1978	343
12-04-2017	2	480	2043	387
12-04-2017	3	400	2182	515

12-04-2017	2	430	1875	523
12-05-2017	2	480	1817	394
12-05-2017	3	390	1745	565
12-05-2017	1	380	1924	509
12-06-2017	2	396	2036	440
12-06-2017	1	336	1738	468
12-06-2017	3	345	1847	439
12-07-2017	1	340	2244	437
12-07-2017	3	370	1949	291
12-07-2017	2	635	2442	215
12-08-2017	2	370	2598	435
12-08-2017	1	400	2426	273
12-08-2017	3	370	2467	350
18-12-2017	1	350	1927	408
18-12-2017	2	340	1815	409
18-12-2017	3	335	1452	496
19-12-2017	1	470	2011	435
19-12-2017	2	479	1825	279
19-12-2017	3	410	2261	365
21-12-2017	2	420	2220	280
21-12-2017	1	450	2272	322
21-12-2017	3	470	2153	260
16-01-2018	1	513	1897	320
16-01-2018	2	548	1958	375
16-01-2018	3	545	2047	301
23-01-2018	1	340	1503	345
23-01-2018	2	340	1842	438
23-01-2018	3	350	1958	469

24-01-2018	1	560	2058	427
24-01-2018	2	600	1955	428
24-01-2018	3	480	2116	468
25-01-2018	1	561	1912	390
25-01-2018	2	590	1807	402
25-01-2018	3	460	1941	449
27-01-2018	1	527	1763	428
27-01-2018	2	349	1683	446
27-01-2018	3	620	1588	381
29-01-2018	1	619	1874	449
29-01-2018	2	332	2083	486
29-01-2018	3	410	1893	461
30-01-2028	1	655	1587	424
30-01-2028	2	660	1593	430
31-01-2018	1	656	1548	423
31-01-2018	2	651	1643	435
02-01-2018	1	566	1786	440
02-01-2018	2	630	1757	418
02-03-2018	1	623	1825	456
02-03-2018	2	660	1770	454
02-10-2018	2	658	1686	447
02-10-2018	3	660	1620	398
02-12-2018	2	340	1612	413
02-12-2018	3	335	1665	418
13-02-2018	2	545	1653	427
13-02-2018	3	550	1545	406
14-02-2018	2	643	1607	403
14-02-2018	3	660	1624	398

15-02-2018	2	530	1579	404
15-02-2018	3	560	1639	408
16-02-2018	2	347	1595	400
16-02-2018	3	660	1637	395
17-02-2018	2	657	1696	401
17-02-2018	3	660	1583	395
19-02-2018	1	472	1523	351
19-02-2018	2	605	1637	388
19-02-2018	3	475	1603	362
03-06-2018	1	470	1605	418
03-06-2018	2	630	1546	387
03-06-2018	3	560	1618	391
03-07-2018	1	563	1572	403
03-07-2018	2	620	1556	388
03-07-2018	3	640	1604	381
03-08-2018	1	500	1573	404
03-08-2018	2	465	1538	392
03-08-2018	3	498	1661	397
03-09-2018	1	350	1340	384
03-09-2018	2	335	1356	391
03-09-2018	3	340	1241	404
03-12-2018	1	497	1490	390
03-12-2018	3	490	1482	409
19-03-2018	1	499	1260	365
19-03-2018	3	380	1261	345
20-03-2018	1	525	1344	386
20-03-2018	3	534	1379	400
21-03-2018	1	340	1447	398

21-03-2018	3	342	1473	399
22-03-2018	1	420	1410	381
22-03-2018	2	346	1458	400
23-03-2018	1	525	1493	398
23-03-2018	2	530	1477	381
24-03-2018	1	590	1528	390
24-03-2018	2	535	1513	378
26-03-2018	1	586	1521	389
26-03-2018	2	600	1511	396

It is clear from the above test reports performed and submitted by SGS, the values of SO₂ and NO_x as per Flue gas composition test result and as per stack monitoring with portable Flue gas analyser are in line with the calculated values of range of coal from performance coal to worst coal. The above mentioned NO_x values have been achieved with SOFA burners on line (only Combustion tuning etc. is pending). As per CEA recommendations on engineering aspects, CEA recommended technology so as to limit the SO₂ emissions which would comply with revised emission norms even when worst coal is used. Hence TSPL shall be designing the FGD system on performance coal value of SO₂ emission at ID fan outlet as 1992mg/Nm³ & worst coal – SO₂ emission value as 2711 mg/Nm³, so that plant can meet up the new emission norms at all times of operations of plant throughout its lifetime.

- v) In earlier Feasibility Reports submitted to PSPCL, the emission for SO₂ was considered at 2906 mg/Nm³, based on the blending of

domestic coal with worst Sulphur imported coal. In that case, the minimum designed SO₂ reduction of 93.5 % would be required to bring down the maximum SO₂ emission level of 2906 mg/Nm³ to less than 200mg/Nm³, but a higher reduction efficiency of 95% was selected based on the following aspects:

- a) Flexibility in firing of different types of coal (both imported, domestic and its blends) with probable/occasional cases of domestic coal firing having sulphur content higher than 0.6%.
 - b) Better performance and effectiveness of the selected technology with less power consumption and better utilization of reagent
 - c) Guaranteed efficiency of the present available technologies in the market
- vi) In final feasibility report submitted to PSPCL & PSERC, TSPL, has considered best coal of 34% ash & 0.45% Sulphur content and considered performance coal of 34% ash & 0.5% Sulphur. Based on the 0.5% Sulphur coal, the minimum designed SO₂ reduction of 91 % would be required to bring down the maximum SO₂ emission level of 2012 mg/Nm³ to less than 200 mg/Nm³, but a higher reduction efficiency of 95% is selected based on the following aspects:
- a) Flexibility in firing of different types of coal with probable/occasional cases of coal firing having slightly higher Sulphur content.

- b) Better performance and effectiveness of the selected technology with less power consumption and better utilization of reagent.
- c) Guaranteed efficiency of the present available technologies in the market.
- vii) Though TSPL shall use 34% ash (Quarterly basis) & 0.5% Sulphur content coal, there is need to keep some flexibility in firing range while designing the FGD. For worst coal considered in original boiler design by EPC contractor, the SO₂ emission value estimated as per above calculations shall be 2711 mg/Nm³ for the worst coal of 45% ash & 0.6% Sulphur content. Considering the flexibility in boiler firing range for lifetime of power plant and also to meet up MOEF norms on emission throughout the lifetime operation of power plant, it is required to keep the SO₂ emission value of 2711mg/Nm³ for designing FGD system for boiler - worst coal condition and to consider the SO₂ emission value of 1992 mg/Nm³ for performance coal condition.
- viii) Efficiency of the absorber system has nothing related to capacity of the FGD considered. The efficiency of FGD system depends on ratio of volume of flue gas-SO_x emission at outlet to volume of flue gas-sox emission at inlet. For further clarification, the table indicating changes done in capacity of the system, is given below :

Particulars	Draft Feasibility report submitted vide letter dated 12.01.2017 with SO _x emission value at 2738mg/Nm ³ for worst boiler design coal	Final Feasibility report submitted vide letter dated 23.06.2017 with SO _x emission value at 2012mg/Nm ³	Calculated value of So ₂ deducting SO ₃ (at 1992mg/ Nm ³) for Performance coal of 0.5% Sulphur & 34% ash	Calculated value of So ₂ deducting SO ₃ (at 2711 mg/ Nm ³) for Worst boiler design coal of 0.6% Sulphur &45% ash	Reference

Estimated SO ₂ emission rate at ID Fan outlet (TPH)	6.092	4.65	4.233 (for Opex calculations)	6.031 (For FGD Design)	Appendix- 4 of Feasibility report dated 4Jan2018
Estimated lime stone consumption for FGD (TPH)	12	8.65	8.25 (for Opex calculations)	11.75 (for FGD design)	
Estimated by product i.e. Gypsum (TPH)	20.52	15.05	14.22 (for Opex calculations)	20.26 (for FGD design)	

A perusal of the above clearly indicates that the input design parameters in accordance with which the FGD system has to be designed, have been clearly changed in light of a change in estimated SO₂ emission levels, keeping 95% efficiency of FGD system as follows:

- a) For Opex Purpose, Performance coal shall be considered with input SO₂ emission of 1992 mg/Nm³, Limestone consumption of 8.25 PTH per Unit & Gypsum production of 14.22 TPH per unit.
- b) For design purpose of FGD, worst coal shall be considered with input SO₂ emission of 2711 mg/Nm³, Limestone consumption of 11.75 PTH per unit & Gypsum production of 20.26 TPH per unit. It is based on usage of worst coal at short periods of few/several occasions as per input coal quality, keeping quarterly average coal quality within limit as per MOEF norms.

Thus, PSPCL's assertion that TSPL is seeking a higher capacity of FGD is denied as wrong. PSPCL consider the above points in order to achieve SO₂ emission within limits as per new emission norms of MOEF at all times of plant operations throughout its lifetime.

ix) PSPCL has submitted that “*from the Stack Monitoring data the emission of NO_x is varying from 175 mg/Nm³ to 482 mg/Nm³*”. It is clarified that the stack monitoring data is based on the instantaneous values measured at stack and has varied as they are based on spot sampling done manually by the third party under different loads, coal composition & process parameters. Considering compliance of new emission norms of NO_x (to achieve less than 300mg/Nm³) at all times of plant operations (design coal & worst coal conditions & all load patterns), the stack emission data of a particular operating condition cannot be relied as the input for design. PSPCL’s calculation wherein reduction of 40% has been considered after combustion tuning even when SOFA was already taken on line is wrong, as emission reduction of approx. 25% (out of 40% expected reduction) has already taken place after taking SOFA on line to reach the value at 175 - 482mg/Nm³. After this, only a reduction of around 15%-20% is possible with Combustion fine tuning which would result into values of around 149 to 410 mg/Nm³ i.e. the stipulated limit of 300 mg/Nm³ cannot be reached only with combustion control.

a) Instead of referring to instantaneous values measured at various fuel/ firing/ loading conditions as stated by PSPCL, now, TSPL needs to follow the calculated value of NO_x emissions for input design coal of 34% ash, 0.45 to 0.5% Sulphur content as mentioned in Feasibility Report and calculated values of NO_x emissions are 572 mg/Nm³ for best coal of 34% ash, 0.45% Sulphur and 633 mg/ Nm³ for performance coal of 34% ash, 0.50% Sulphur.

- b) Maximum Baseline NO_x Emissions Level at Part Load/during operational changes after proper combustion tuning and coordinated operation of existing combustion control technologies shall be 350 mg/Nm³ and 385 mg/Nm³ for design & worst coal respectively; NO_x Reduction efficiency required (%) for SNCR system to achieve 300 mg/Nm³ at all loads after proper combustion tuning and coordinated operation of existing combustion control technologies shall be 15% and 25% for design & worst coal respectively. Thus, considering compliance of new emission norms of NO_x at all times of plant operations (design coal & worst coal conditions & all load patterns) it is very much important to go for SNCR system in addition to combustion tuning, as per submitted feasibility report. Hence, PSPCL's submission regarding reduction of capacity of SNCR is wrong.
- x) The word 'estimate' has been used for timelines of expenses that have been made continuously since beginning of the project and no apportioning of the same has been done in the year wise manner as TSPL project has been developed as an EPC project on continuous basis which covers environment protection measures also. The word 'estimate' has not been used in terms of amount expended on environmental protection measures and total amount expended on the same is reconfirmed to be as Rs.1204.1 Cr as per Annexure-C of Affidavit submitted vide letter no. TSPL/PSERC/AK/MAR-18/60 dated 26.3.2018 in compliance of Commission's Order dated 16.2.2018. As per Environmental

clearance obtained from MOEF dated 11th July, 2008, it is mentioned that “total cost of project is Rs.8000 Crore which includes Rs.461 Crore for environmental protection measures”. TSPL has already implemented all environmental protection measures as mentioned in EC dated 11th July, 2008 such as Hybrid ESP (ESP+FF) system, High concentration slurry disposal system, Ash dyke, wastewater / sewage water treatment system, Zero discharge system, Ambient Air quality stations, Chimney Emission monitoring system, Dust suppression & dust extraction system & etc. at a cost of Rs.1204.1 Crore. This is significantly higher than Rs.461 Crore which was to be spent on environmental protection measures as per EC dated 11th July, 2008. Details of year-wise operational expenditure are as follows:

Year	Annual Environmental expenditure - Operational phase (Rs. In lakhs)	Remarks
2014-15	305.79	Operational expenditure of Rs.8396.82Lakhs(=Rs.8669.55–Rs.272.73 Lakhs as spent on Green belt from FY 14-15 to FY16-17) has also been spent on Environmental protection measures over & above Rs.1204 Cr. of projects expenditure. Hence, total expenditure on Environmental protection measures is Rs.1204 Cr.
2015-16	1378.10	
2016-17	3151.20	
2017-18	3834.46	
Total	8669.55	

Total funds earmarked for Environmental protection measures was Rs.461 Crore as per EC dated 11-Jul-2008. There is no balance amount available on this account with TSPL.

- xi) Since as on cut-off date, there was no requirement for TSPL to install FGD and hence the funds for the same have not been earmarked. TSPL is claiming for FGD pass through solely on the principle of “Change in Law” as provided under PPA. It is rather PSPCL which is confusing the unambiguous terms of the EC by claiming that FGD could have been the part of that EC without any proof / supporting for the same.
- xii) The CEA has asked for the yearly average SO₂ & NO_x data vide their Format-1 of letter Ref No. 44/FGD/UMPP/ CEA/2017 dated 09.10.2017. TSPL submitted to CEA the following details in which SO₂ and NO_x values were derived from actual coal data:

Parameters	2014-15	2015-16	2016-17
a) Grade	G 11-G15 \$	G 11-G16 \$	G 11-G16 \$
b) GCV	3792^	3417^	3192^
c) Ash (%)	33.75^	37.23^	40.84^
d) Moisture (%)	13.45	13.4	12.73
e) VM (%)	24.31	22.87	20.72
f) H ₂ (%)	2.87	2.52	2.31
g) O ₂ (%)	3.96	2.52	2.31
h) N ₂ (%)	0.81	0.76	0.73
i) C (%)	44.7	40.47	38.44
j) S (%)	NA	0.41	0.44
k) Hg (%)	Not Available		
l) HGI	Not Available		
SOX value yearly Average (mg/Nm ³)	U1 Avg-NA U2 Avg-1517 U3 Avg -NA	U1Avg-NA U2Avg-1632 U3 Avg-1631	U1Avg-1617 U2Avg-1617 U3 Avg-1617

Parameters	2014-15	2015-16	2016-17
NOX value yearly Average (mg/Nm ³)	Unit-2-506	Unit-2-567 Unit-3-567.3	Unit-1-600.5 Unit-2-600 Unit-3-600
SPM value(mg/Nm ³)	Unit-2-33	Unit-2-37 Unit-3-45	Unit-1-46 Unit-2-46 Unit-3-45

(Based on Blended Coal (Domestic FSA with MCL Imported)

As mentioned earlier, CEMS data has varied on some occasions due to disturbance in sampling conditions such as sample filter choking, sample tube leakage issues, sample heater malfunctioning, DCS cable signalling issues, combustion stability issues during Units start-up & shutdown periods, etc. and analyser calibration issues on certain occasions. This has resulted into value of CEMS data going erroneous on some occasions. Moreover, stack monitoring data provided to PPCB is based on samples collected manually by way of spot sampling at stack sampling point under different load, coal composition & process parameters condition on instantaneous basis. Thus, the values of instantaneous monitoring done in stack monitoring data and average data collected by CEMS may have variations from annual actual emission conditions of plant. Hence, in order to give emission values which are closer to actual operating conditions, TSPL has furnished details of annual average SO₂ & NO_x emission details, which are calculated from actual Sulphur content of coal, Coal firing rate & other actual process parameters by using globally followed methodology and thus, emission values submitted to CEA for the Units are almost similar.

In the same letter CEA, has also asked for actual Flue Gas composition reports from TSPL. In this regard, TSPL has engaged MoEF & CC recognised third party M/s SGS for conducting Flue gas composition study & stack monitoring with calibrated portable flue gas analyser to furnish reports.

PSPCL is requested to consider the calculated values which are in range of Flue gas composition study & stack monitoring with calibrated portable flue gas analyser reports, conducted from Nov'2017 to Apr'2018. PSPCL is further requested to help in expediting the process implementation of FGD to comply with revised norms of MoEF & CC at the earliest. As per CEA recommendations on engineering aspects, CEA recommended technology to limit the SO₂ emissions below environment norms as per worst coal conditions. Even NTPC specifications also support the same concept in this matter. As per CEA technology recommendation, the emission value of SO₂ shall be derived for worst coal as 2711mg/Nm³ in TSPL's case. Thus, it is requested to consider the emission value of worst coal (2711mg/Nm³) for designing FGD and the same for performance coal of 0.5% Sulphur & 34% ash for OPEX calculations. Hence, there is no question of CEA recommendation based on higher values.

- xiii) At the time of submission of data to CEA, only the Report dated 15th Jan, 2018 provided by SGS was available with TSPL and the same was shared with CEA with a copy to all concerned. A copy of the data shared with CEA was also marked to PSPCL in good faith. Reports dated 15th January' 2018 to 24th May, 2018 for the data

collection period from 28/11/2017 to 30/4/2018 as conducted by SGS India, are enclosed. It may also be noted that CEA has requested the data from all entities in Format I (Flue Gas Composition Test Reports), considering that the same test report along with calculated as per globally accepted methodology gives the better estimate and reliance can be placed on the same for FGD design. It is categorically denied that TSPL has submitted any wrong data to any party. The relevant data as submitted has been shared to all concerned including the Commission, PSPCL & CEA along with the basis of data.

- xiv) In relation to the PSPCL's averment that TSPL is still seeking lining work in the old chimney, CEA had asked the comparison between old chimney with lining & FGD with new chimney. The same has been compared along with their estimated cost comparison in feasibility Report of Jan, 2018. PSPCL's contention is misplaced as TSPL has not sought lining work in old chimney in its latest feasibility report. Regarding PSPCL's point about reduced capital cost in Jan, 2018 feasibility report, as per above amendment in norms, it is more economical to go for new wet chimney of reduced height. The estimated cost of FGD with new chimney is lower due to lower opportunity loss cost on account of lower shutdown required of 60 days for each unit (30 days required for FGD only and 60 days required for FGD & SNCR both) as compared to 120 days of shutdown for each unit envisaged in case of old chimney with lining. TSPL has also optimized the CAPEX cost of FGD by removing Gas to Gas Heat exchanger in FGD system considering better lining in new wet chimney.

CEA has recently given its recommendations on FGD installations at TSPL vide their report "Recommendation report of CEA on installation of FGD to meet Environment (protection) amendment rules, 2015 notified by MOEF & CC". The CEA report along with its recommendations has already been shared with the Commission and PSPCL vide TSPL's letter no. TSPL/PSERC/AM/MAY-18/116 dated 21.05.2018. As per the said report, CEA recommended at page No. 11 that "*Considering the cost comparison of opportunity loss w.r.t. old chimney lining and new chimney, it is recommended to go for a new wet stack as per new amendment of MoEF & CC (yet to be notified) in chimney height*".

xv) PSPCL's co-operation is needed for faster implementation of FGD, De-Nox etc. system to comply with new emission norms as it will take minimum 27 to 34 months from the date of ordering to implement the system. Presently, assuming that ordering gets completed by 31st Dec, 2018 the implementation of FGD in all 3 Units will not be possible before October, 2021. The recommendations as issued by CEA may be considered by the Commission for earliest implementation and allow the prayers in the Petition.

9. Information submitted by TSPL in compliance of the Order dated 11.06.2018, in brief, is as under:

i) TSPL engaged M/s.SGS India Pvt. Ltd. for gas composition test and stack monitoring test because SGS India Pvt. Ltd. is an MoEF & CC recognized laboratory for carrying out the functions entrusted to such environmental laboratories under the Environment (Protection) Act, 1986. The gazette notifications issued by the MOEF & CC dated

26.02.2014 and 18.07.2007 recognizing SGS India Pvt. Ltd. were also submitted.

- ii) SGS' Reports of unit-wise emissions as per Flue gas composition tests and stack monitoring tests were enclosed by TSPL in the affidavit. The Flue Gas composition test reports have been requisitioned by CEA also vide their letter No.44/FGD/UMPP/CEA/2017 dated 09.10.2017 keeping in mind the high accuracy of such test results for concluding technology recommendation. The summary of flue gas composition test results and stack monitoring with calibrated portable Flue gas analyser of SO₂ & NO_x may be referred as already submitted by TSPL in its submissions to the reply dated 27.04.2018 filed by PSPCL.

The said NO_x values have been achieved with SOFA burners on line (only Combustion tuning etc. is pending). Only Unit wise measurement of SO₂ & NO_x is possible as stack flue cans and sampling points are separate for each Unit and hence plant as a whole emission values could not have been separately recorded.

- iii) The online emission monitoring system at TSPL's plant i.e. CEMS continuously monitors SO₂ & NO_x data and the data is being maintained on hourly average basis. Further, CEMS captures data at all conditions. CEMS data has varied on some occasions due to disturbance in sampling conditions such as sample filter choking, sample tube leakage issues, sample heater malfunctioning, DCS cable signalling issues, combustion stability issues during Units start-up & shutdown periods, etc. and analyser calibration issues on certain occasions. In order to take care of erroneous values, the

highest value of daily CEMS average has been taken as representative value for the respective month submitted as CEMS value earlier vide our letter no. TSPL/PSERC/AK/ MAR-18/60 dated 26.03.2018.

Stack monitoring data submitted to various agencies / authorities i.e. PPCB are based on samples collected manually by way of spot sampling at stack sampling point on instantaneous basis under different load, coal composition & process parameters etc. CEA has asked for the yearly average SO₂ & NO_x data vide their Format-1 of letter Ref No. 44/FGD/UMPP/CEA/2017 dated 09.10.2017. TSPL has furnished details of annual average SO₂ & NO_x emission details, which are calculated from actual Sulphur content of coal, actual load & other actual process parameters by using globally followed methodology. Hence, emission levels in the reports submitted by TSPL to various agencies / authorities i.e. PPCB, CEA and CEMS data would vary.

- iv) Stack emission data submitted to PPCB/CPCB / MoEF & CC for the period of December-2014 to May, 2018 was enclosed along with graphical representation of the same. Mercury (HG) in stack emissions has been reported below the limit i.e. <0.03 mg/Nm³ all the time for all the Units. Stack monitoring data submitted to various agencies / authorities i.e. PPCB are based on samples collected manually by way of spot sampling at stack sampling point on instantaneous basis under different load, coal composition & process parameters etc. Further, TSPL enclosed Stack monitoring data submitted to PPCB/ MOEF has not been corrected to 6% Oxygen on

dry basis as the new draft notification of MOEF & CC was issued on 16.10.2017.

- v) The CEA requisitioned from TSPL the yearly average SO₂ & NO_x data vide their Format-1 of letter Ref No. 44/FGD/UMPP/CEA/2017 dated 9.10.2017 and PSPCL submitted the details in which SO₂ and NO_x values were derived from actual coal data.

\$ G-11- G13 grades are as per MCL bills. However, actual coal received is of much inferior quality and poor grade.

In addition, TSPL also received coal from alternate imported sources which has not been included in the above.

As mentioned earlier, CEMS data has varied on some occasions due to disturbance in sampling conditions such as sample filter choking, sample tube leakage issues, sample heater malfunctioning, DCS cable signalling issues, combustion stability issues during Units start-up & shutdown periods, etc. and analyser calibration issues in certain occasions. This has resulted into value of CEMS data going erroneous in some occasions. Moreover, stack monitoring data provided to PPCB/MOEF is based on samples collected manually by way of spot sampling at stack sampling point under different load, coal composition & process parameters condition on instantaneous basis. Thus, the values of instantaneous monitoring done in stack monitoring data and average data collected by CEMS may have variations from annual actual emission conditions of the plant. Hence, in order to give emission values which are closer to actual operating conditions, TSPL has furnished details of annual average SO₂ & NO_x emission details, which are calculated from actual Sulphur content of

coal, Coal firing rate & other actual process parameters by using globally followed methodology. Calculation methodology and calculation sheet may be referred as already submitted by TSPL in its submissions to reply dated 27.04.2018 filed by PSPCL.

- vi) In the Environmental Clearance issued by MOEF & CC dated 11.07.2008, the following relevant points related to emissions were stated:

“...3(iv) A Bi flue stake of 275m height shall be provided with continuous online monitoring equipments for SO_x, NO_x and particulate. Exit velocity of flue gases shall not be less than 25m/Sec.

...

3(v) High efficiency Electrostatic Precipitator (ESP) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm³.

...

3(xxi) Regular monitoring of ground level concentration of SO₂, NO_x, SPM, RSPM shall be carried out in the impact zone and record maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring station and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the regional office of this ministry ...”

It is clear that MOEF & CC have mentioned parameters of particulate matter emission to be within 50 mg/Nm³. No original design parameters for SO_x & NO_x emissions were mentioned in the

Environmental Clearance issued by MOEF & CC dated 11.07.2008 and EC amendments thereafter till December, 2015. TSPL prepared the Environmental Impact Assessment (EIA) report by deputing a consultant, Desein Private Ltd. and they submitted the EIA report to MOEF for obtaining Environmental Clearance. As per the EIA report, Emission per flue (one unit) has been mentioned as follows:

- SO₂ in Kg/Hour – 3141
- NO_x in Kg/ Hour- 2826.9

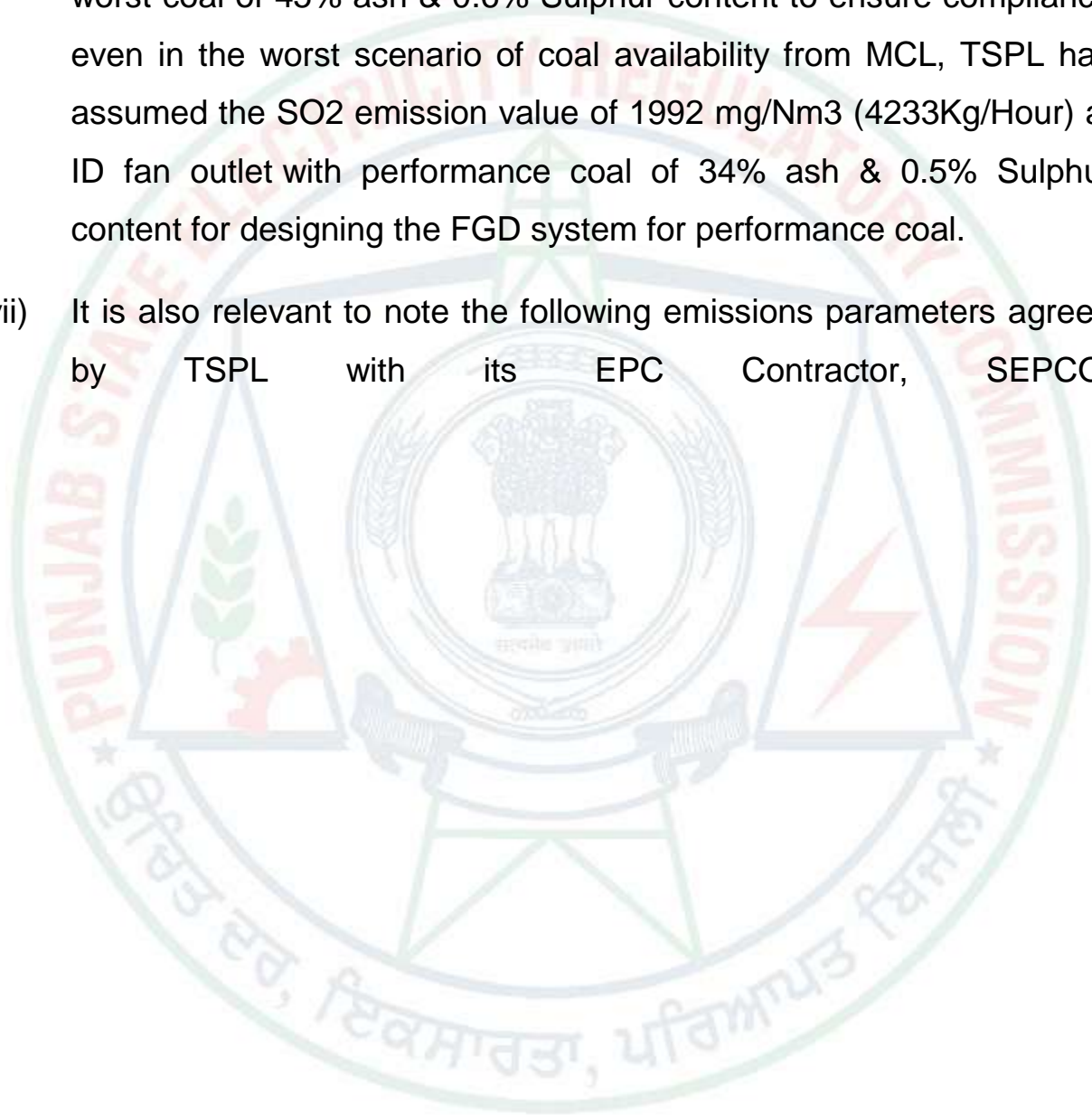
In the EIA report, plant configuration of 4X500MW was considered and later on TSPL got EC amendment on 25.03.2010 whereby the configuration of the plant was changed to 3 X 660MW. Thus, the original emissions were estimated and calculated considering the 4X500MW configuration. The relevant excerpts of the EIA Report pertaining to emission projections were also annexed.

SO₂ value in Kg/hour for 660MW units by extrapolating on a proportionate basis from the SO₂ values for 500MW units in the original EIA is 4146 Kg/Hour. TSPL has calculated the SO₂ value for the performance coal of 34% ash & 0.5% Sulphur content as 4233 Kg/Hour, which is almost equal to the emission calculation in the original EIA report. Further, TSPL has designed its FGD system to handle the worst possible coal, which may contain 45% ash & 0.6% Sulphur in order to ensure the plant's availability & performance throughout its lifetime factoring for the variations in MCL coal receipt. This is important as the MOEF Notification does not provide for any exceptions or carve out for compliance with the standards. Thus,

TSPL risks non-compliance, if the emission standards are breached at any given point of time.

Even though SO₂ emission value for FGD design shall be kept for worst coal of 45% ash & 0.6% Sulphur content to ensure compliance even in the worst scenario of coal availability from MCL, TSPL has assumed the SO₂ emission value of 1992 mg/Nm³ (4233Kg/Hour) at ID fan outlet with performance coal of 34% ash & 0.5% Sulphur content for designing the FGD system for performance coal.

- vii) It is also relevant to note the following emissions parameters agreed by TSPL with its EPC Contractor, SEPCO:



Maximum pollutants present in the plant effluent while working at 100% BMCR with the worst coal		Remarks
a) Particulate matter in the flue gas at the outlet of electrostatic precipitator,	50 mg/Nm ³	
b) NO _x (expressed as NO ₂) in stack gas, corrected to 6% Oxygen.	262 ppm (or 537 mg/Nm ³)	Though no norm for NO _x available till 7.12.2015, TSPL on its own has implemented Low NO _x burner with provision of SOFA
c) SO ₂ in stack gas	Not mentioned in EPC contract. However, concentration of SO ₂ has been considered by SEPCO as 2329 mg/Nm ³ on wet basis which is equivalent to 2614.6 mg/Nm ³ on dry basis.	Not mentioned in EPC contract specifications because no SO ₂ standards were available at the time of ordering and up to 7.12.2015

The project report for 2000 MW TSPL project prepared by Desein Private Ltd. in January, 2008, under the Indian National Ambient Air Quality standards (NAAQS) applicable for industrial areas, the norms for SO₂ & NO₂ are 80 micro/m³ (Annual average) and 120 micro/m³ (24 hours average).

The norms got further revised in 2009 and the limit became 50 micro/m³ (Annual average) & 80 micro/m³ (24 hours average) for SO₂ and 40 micro/m³ (Annual average) & 80 micro/m³ (24 hours average) for NO₂ for industrial area. TSPL plant-Mansa plant is not an eco-sensitive area. Hence, the ambient air quality (AAQ) standards for industrial area are applicable to TSPL's plant. The monthly AAQ (SO₂&NO₂) data for the period of December, 2014 to

May, 2018 clearly shows the SO₂ & NO₂ values never crossed NAAQS. The SO₂ & NO₂ standards are for ambient air quality but not for stack emissions. Ambient air quality is measured at ground level and may be impacted by a multitude of factors and industries whereas stack emissions are measured at a specific thermal power plant's chimney on a continuous basis.

Actual achieved Ambient Air quality parameters during the months of commissioning of Units & station are given below:

Month	Station-1					AAQMS Station No.
	PM-10	PM-2.5	SO ₂	NO ₂	CO	
Limit as per CPCB standard	100	60	80	80	2	
UOM	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	
December, 2014 (Unit2 in operation after COD)	53.10	30.10	11.50	20.80	0.81	Station1 (near Transit Hostel)
November, 2015 (Unit3 COD month while unit2 in operation)	65.48	28.02	9.12	12.30	0.45	
August,2016(Unit1 COD month with Unit 2&3 in operation)	79.00	39.00	23.00	28.00	1.20	
September, 2016 (Station COD month)	78.00	42.00	19.00	20.00	1.70	
December, 2014 (Unit2 in operation after COD)	66.60	33.40	12.90	20.50	1.00	Station2 (near Store yard)
November, 2015 (Unit3 COD month while unit2 in operation)	64.75	33.47	8.96	14.97	0.45	
August, 2016 (Unit1 COD month with Unit 2&3 in	79.00	38.00	29.00	31.00	1.40	

operation)						
September, 2016 (Station COD month)	84.00	46.00	20.00	22.00	1.80	
December,2014(Unit 2 in operation after COD)	65.00	30.60	10.20	16.30	0.37	Station3 (near Railway Control Building)
November,2015 (Unit3 COD month while unit2 in operation)	62.41	33.40	8.11	14.07	0.63	
August, 2016 (Unit1 COD month with Unit 2&3 in operation)	80.00	38.00	27.00	28.00	1.50	
September, 2016 (Station COD month)	85.00	42.00	18.00	24.00	1.40	
December, 2014 (Unit2 in operation after COD)	71.10	36.70	13.80	23.50	0.87	Station4 (Near Coal Handling Plant)
November, 2015 (Unit3 COD month while unit2 in operation)	64.18	33.36	9.97	15.29	0.75	
August,2016(Unit1 COD month with Unit 2&3 in operation)	81.00	36.00	27.00	30.00	1.80	
September, 2016 (Station COD month)	82.00	39.00	21.00	23.00	1.60	

- vii) In its Recommendation Report on FGD installation, the CEA has indicated a timeline of approximately 28 months for the installation of the FGD. Presently, assuming that equipment ordering gets completed by 31.12.2018, the target date for implementation of the FGD system would fall on 01.04.2021 according to the CEA's overall tentative timeline. The last date for installation of the FGD system in Unit 3 of TSPL's plant has been mentioned by the CEA as 28.02.2021 subject to a margin of 4 months based on site specific conditions and assuming that commissioning targets of subsequent Units will depend on successful demonstration of preceding units i.e.

the FGD system for Unit 3 can be commissioned only after the FGD Systems of Units 1 and 2 are successfully demonstrated.

Meeting the above time lines depends on timely clearance by the Commission in the captioned matter and after arrangement of funding to implement the said measures. As per TSPL's internal estimates on a best efforts basis the implementation of FGD in all 3 Units can be done in an approximate timeline of 34 months, which would place the approximate target date within October, 2021.

- viii) TSPL submitted that Nitrogen oxides are generated as a result of combustion of coal at elevated temperatures. The NO_x emission levels depend on the composition of coal, operating load and nature of operation. The estimated post combustion generation of uncontrolled NO_x emissions (in mg/Nm³ at 6% O₂, dry basis), at full load operation and without considering the operation of any NO_x control technology.

The existing Units are presently equipped with the combustion control technologies of Low NO_x Burners (LNB) with supply of over fire air, through the Separated Over Fire Air (SOFA) ports in the furnace. By tuned and coordinated operation of the existing Low NO_x Burners with regulated supply of optimal amount of excess air through SOFA ports, a minimum NO_x reduction efficiency of 45% could be achieved.

Hence, the first step to control the NO_x emissions is to further restrict the uncontrolled NO_x generation at the combustion zone of the boiler by combustion tuning and performance enhancement of the existing combustion control technologies. This method requires the

Boiler OEM to perform proper combustion study, analysis & optimization, to determine the optimal operating techniques and conditions for coordinated operation of LNB with SOFA. The allowable NO_x emission level at full load might not be achievable with the existing combustion control technologies alone, even after suitable combustion tuning.

At part load operations, the NO_x emission levels might further increase due to more O₂ availability when percentage excess air supplied is more or uncontrolled. Moreover, the present combustion control technologies may not perform to the desired extent at part load operations and during load fluctuations. Hence, depending on the nature of operation as well as at part load conditions, the NO_x emissions might further increase to a maximum of about 10%, from the estimated baseline levels at full load.

Thus, the permissible limit of 300 mg/Nm³ (6% O₂, dry basis) would not be achievable at part load and full load operation for the given input coals, with combustion control technology alone, even after suitable combustion tuning and optimization. Hence, to achieve the desired limit at all loads and operating conditions, with the given range of coals & its combinations, Selective Non Catalytic Reduction (SNCR) technology with a minimum designed reduction efficiency of 35 % is recommended.

SNCR is a post combustion control technology and would chemically treat the flue gas by reagent (25% aqueous ammonia) injection. The minimum designed NO_x reduction efficiency is specified based on the extent of NO_x abatement required, existing plant design parameters, flexibility of fuel firing at varied operating

conditions, and to meet any further stringent emission norms in the future requiring greater extent of NOx emissions abatement.

Table- Estimated tentative NOx Emission and Control

Sr. No.	DESCRIPTION	INPUT COAL	
		Design	Worst
1	Maximum Uncontrolled NOx generation in the furnace without NOx abatement (mg/Nm ³ at 6% O ₂ , dry basis)	572	633
2	Achievable NOx Reduction after proper combustion tuning and coordinated operation of existing combustion control technologies (%)	45	45
3	Baseline NOx Emissions Level at Full Load after proper combustion tuning and coordinated operation of existing combustion control technologies (mg/Nm ³ at 6% O ₂ , dry basis)	315	349
4	Maximum Baseline NOx Emissions Level at Part Load/during operational changes after proper combustion tuning and coordinated operation of existing combustion control technologies (mg/Nm ³ at 6% O ₂ , dry basis)	350	385
5	NOx Reduction efficiency required (%) for SNCR system to achieve 300 mg/Nm ³ at all loads	15	25

Maximum Baseline NOx Emissions Level at Part Load/during operational changes after proper combustion tuning and coordinated operation of existing combustion control technologies shall be 350 mg/Nm³ and 385 mg/Nm³ for design & worst coal respectively; NOx Reduction efficiency required (%) for SNCR system to achieve 300 mg/Nm³ at all loads after proper combustion tuning and coordinated operation of existing combustion control technologies shall be 15% and 25% for design & worst coal respectively. Thus, considering compliance of new emission norms of NOx at all times of plant operations, it is very much important to go for SNCR system in

addition to combustion tuning, as per submitted final feasibility report dated 15.06.2017.

Based on above technical requirement to ensure the NO_x within limit of new emission norms of MOEF & CC, the following Capital Expenditure has been worked out:

Sr. No.	CAPEX	Base Cost (Rs. Lakhs)	Transportation & Insurance Cost @ 7% of Base Cost	Taxes & Duties @ 23.06% of Base Cost	Total Cost
Capital Expenditure (CAPEX) for DeNO _x System		<i>Rs. Lakhs</i>	<i>Rs. Lakhs</i>	<i>Rs. Lakhs</i>	<i>Rs. Lakhs</i>
1	SNCR & Auxiliary system Equipment, Combustion Tuning/Boiler Optimization and related mechanical works cost for Three Units	9225.0	645.8	2127.3	11998
2	Total Electrical works cost (for SNCR and related common facilities) of Three Units	225.0	15.8	51.9	293
3	Total Civil works cost (for SNCR and related common facilities) of Two Units	210.0	14.7	48.4	273
4	Cost of Spares at 3% on Items 1 and 2	283.5	19.8	65.4	369
5	Total Cost of Works	9944	696	2293	12933
6	Contingency at 5% of total works cost	497.2	34.8	114.6	647
7	Engineering and Project Management cost @ 3% of Total works	298.3	20.9	68.8	388
8	Total Cost of Works including Contingency, Engineering & Project Management	10739	752	2476	13967
COST OF DeNO _x PER MW IN Rs. CRORES /MW		0.054	0.004	0.013	0.071

TSPL further submitted that the above cost does not include any other cost associated with financing, interest cost and any other cost other than those mentioned below:

Above is the initial estimate of only capital expenditure & tariff for the same to be fixed based on the following:

- a) Depreciation on Capital cost and amortisation of opportunity loss cost
- b) Return on Equity including Tax
- c) Interest on Loan
- d) Operation & maintenance cost including but not limited to cost of reagent, spares & consumables, Power, O&M services handling charges & etc. with year on year escalation
- e) Interest on working Capital
- f) Escalation Index & interest Rate considered in above sheet is tentative estimate & the same will be finalised during tariff fixation

TSPL further stated that the basis for taxes and duties considered is as follows:

- a. Imported content considered is 40% with 7.5% Basic CD, 3% Customs Cess and 18% GST.
- b. Indigenous content considered is 50% with 18% GST.
- c. Erection Testing and commissioning is considered at 10% with 18% GST.
- d. With above basis the taxes and duties works out to 23.06%
- e. Transportation and Insurance cost is estimated to be 7%

TSPL further submitted that following are the costs, taxes & duties have been excluded for Capital cost estimation:

- a. Interest During Construction (IDC) cost and other financing charges
 - b. Margin money for working capital
 - c. Exchange rate variation and cost of hedging
 - d. Cost of OEM services regarding interconnection with existing facilities
 - e. Pre-operative Expenses
 - f. Escalation on the Secondary Fuel Oil Costs and Start Up Power
 - g. Return on Equity (ROE)
- ix) PSPCL's involvement is required from the initiation of Bidding process for FGD & SNCR etc. implementation, till final placement of order with the successful bidder. It is TSPL's intention to be entirely transparent and trusts PSPCL will extend its full cooperation to facilitate the timely implementation of the FGD system. It would be helpful if a competent representative of PSPCL is deputed to participate in all discussions from the pre-bid stage up to the stage of award of the contract to the successful bidder. Any concerns or clarifications required by PSPCL with respect to the bid process may be raised in writing to TSPL.
10. In compliance of the Order dated 11.06.2018, PSPCL in brief submitted as under:
- i) TSPL has claimed the changes only in terms of the following:
 - (a) The Emission Norms related to Sulphur Dioxide (SO₂) and the installation of FGD; and

(b) The Emission Norms related to Nitrogen Oxide (NO_x) and the installation of SNCR.

However, in relation to the other emission norms and water norms, there has been no claim by TSPL and the same therefore, is not required to be considered. TSPL is already meeting the emission limits for Suspended Particulate, Mercury as well as for water consumption. Therefore, there is no change in law in regard to the above.

- ii) There is no provision in the PPA for grant of an in-principle approval before the expenditure has been incurred. There cannot be any upward revision in tariff at this stage. The compensation, if any, is also payable under Article 13 only after the expenditure has been incurred. The claim of TSPL, based on project cost of a feasibility report cannot be accepted. TSPL cannot seek in-principle approval of an estimated project cost. Therefore, the Petition is premature at this stage.
- iii) The relief is admissible only after the actual expenditure; the very recognition of change in law requires the expenditure to have incurred. Article 13.1.1 recognizes as change in law only those events, which affect the cost and revenue from business of selling electricity. Therefore, unless there is an impact on cost or revenue, there can be no change in law.
- iv) TSPL has once again in the Affidavit dated 25/26.06.2018 claimed that the timely completion of the environmental measures depends on the Orders of the Commission which is not acceptable. As already submitted before, the obligation to comply with the law is of TSPL. The liability of PSPCL is contractual and the issue pending before the

Commission is on liability of PSPCL and the impact on tariff, if any and does not in any manner prevent TSPL from proceeding with the compliance measures. It is not open for TSPL to refuse to comply with the law. This has already been clarified by the Commission in Order dated 11.06.2018.

- v) With reference to Change In Law has to be considered in the context of existing obligations, PSPCL submitted that TSPL has claimed the amendment in Environment (Protection) Rules as the Change in Law. However, for the change in law provision, the law as prevailing on the cutoff date for TSPL is to be considered, including the requirement for various consents and clearances to be obtained and the conditions imposed therein. TSPL was aware, as on the cutoff date that the project required to obtain various consents and clearances and the Environment Authorities were entitled to impose conditions for such clearances and conditions. Therefore, to the extent that the Environment Clearance or Consents provide for a condition on the operations of the TSPL's power project prior to the Amendment to the Rules, then to that extent, the Amendment is not a change in law since TSPL was already subject to the said conditions. This has also been recognized in the Ministry of Power letter dated 30.05.2018 to the Central Electricity Regulatory Commission, wherein it has been stated as under:

"...5.1 The MoEFCC Notification requiring compliance of Environment (Protection) Amendment Rules, 2015 dated 7th December 2015 is of the nature of Change in Law event except in following cases:

....

(b) TPPs where such requirement of pollutions control system was mandated under the environment clearance of the plant or envisaged otherwise before the notification of amendment rules...

- vi) The Amendment can be considered a Change in Law only to the extent that it imposes new conditions or makes the existing conditions more stringent. For example, the Environment Clearance required the installation of ESP to ensure Particular Matter emission does not exceed 50 mg/N₃, which conforms with the norms set out in the Amendment to the Environment (Protection) Rules. Similarly, the Environment Clearance also provides for cooling towers, which is the requirement under the new norms. Further, the Environment Clearance required TSPL to monitor the emission standards, inter alia, of SO₂ and NO_x and ensure that the same are within prescribed limits. TSPL was also not permitted to use coal with greater than 0.5% sulphur content. The National Ambient Air Quality Standards had also prescribed emission norms for the area. Therefore, it is quite possible that TSPL was already subject to the said conditions by way of other clearances, consents or standards to meet the same standards as is required to be met now under the amended Rules.
- vii) In addition to the Environment Clearance dated 11.07.2008, there have been subsequent clearances imposing additional conditions which is clear from the Compliance Reports, including but not limited to Additional Conditions dated 25.03.2010 and 06.04.2011. Further, the effect of any change in law subsequent to the cutoff date is restricted to the incremental cost or additional expenditure on installation or up-gradation of the plant and equipment to be installed by reason of change in law over and above the expenditure which

was in any event required to be incurred even in the absence of such change in law and not for the entire capital expenditure.

- viii) With reference to reduction in sulphur dioxide emission and installation of FGD, PSPCL submitted that TSPL has claimed the expenditure on installation of FGD as change in law. This is based on the premise that there was no stipulation or condition for installation of FGD on the cutoff date. Under Environmental Laws, the Environment Clearance is required to be obtained for the power project. Further, it was known that the Environment authorities could impose conditions as they think appropriate in the grant of such Environment Clearance and TSPL was not entitled to proceed on the basis that Environmental Clearance shall be absolute and unconditional.
- ix) TSPL has relied on the Letter dated 30.05.2018 by Ministry of Power, Government of India being policy direction under Section 107 of the Electricity Act, 2003. Though the said policy directions are to Central Commission and not to State Commission and even otherwise not binding on the Commissions, the said Policy direction clearly provide that in case the pollution control system was either mandated or otherwise envisaged before the notification of the amendment rules, there is no change in law for such cases. It is the specific case of PSPCL that the installation of FGD was already envisaged before the notification of the amendment rules as also been held by the Hon'ble Tribunal. Therefore, what has to be considered is whether the requirement of installation of FGD was envisaged prior to amendment.

- x) The Environment Clearance dated 11.07.2008 envisaged the installation of FGD as under:

“...(vi) Space provision shall be kept for retrofitting of FGD, if required at a later date.

(xxv) Separate funds should be allocated for implementation of environmental protection measures along with item-wise break-up. These costs should be included as part of the project cost. The funds earmarked for the environment protection measures should not be diverted for other purposes and year-wise expenditure should be reported to the Ministry...”

- xi) The contention of TSPL that the Environment Clearance only provided for space for FGD and did not require the actual installation of FGD is contrary to the above Letter by Ministry of Power. The Letter recognizes two situations – where the pollution control system is mandated and where it is envisaged. Therefore, even if the Environment Clearance does not mandate installation of FGD, it may still envisage the installation/retrofitting of FGD and in such cases also, there is no change in law with regard to FGD. TSPL has sought to distinguish the term ‘installation’ and ‘retrofitting’. There is no such distinction drawn in the Letter dated 30.05.2018. In any event, the term ‘retrofitting’ as opposed to ‘installation’ connotes a stronger emphasis that the FGD was envisaged at the time of the clearance. The said aspect has been considered by the Hon’ble Appellate Tribunal in M/s JSW Energy Limited V/s. Maharashtra State Electricity Distribution Co. Ltd and Another dated 21.01.2013 in Appeal No. 105 of 2011. The Environment Clearance granted to JSW had the similar conditions as the cited above in TSPL’s Clearance. An

appeal has been filed by JSW Energy Limited against the above Judgment being Civil Appeal No.2967 of 2013 which is pending before the Hon'ble Supreme Court.

- xii) TSPL has sought to distinguish the above judgment of the Hon'ble Tribunal on various grounds. The ratio of the judgment is that when the Environmental Clearance required the provision of space for installation of FGD and further, required that separate funds must be allocated for environment measures, then the installation of FGD was already contemplated and the subsequent communication is merely a confirmation of the requirement. The various distinguishing features sought to be raised by TSPL do not impact the above basic finding of the Hon'ble Tribunal as explained hereunder:
- a. TSPL is seeking to draw a specious and frivolous distinction between retrofitting and installation of FGD. If anything, the term 'retrofitting' gives greater emphasis on the fact that FGD was envisaged.
 - b. The issue of Modification of Environment rules being the reason for requirement of FGD does not take away the basic principle of the decision of the Hon'ble Tribunal that the FGD was already envisaged at the time of Environmental Clearance. Once the FGD was already envisaged, the subsequent confirmation of the requirement of FGD cannot be considered as change in law. This contention of TSPL is also negated specifically by the Ministry of Power in its Letter dated 30.05.2018 which provided that if FGD was already envisaged, there is no change in law.

- c. TSPL has sought to distinguish the case of JSW based on permissible sulphur content being higher for JSW than TSPL. If the requirement of FGD in JSW case was because of higher permissible sulphur content, then the condition of space for FGD should never have been included in the Environment Clearance for TSPL. The fact is that both TSPL and JSW's Environment Clearance provided for space for FGD and cost of environment measures based on which the Hon'ble Tribunal had given its finding. Therefore, both cases being similar, the ratio of the Hon'ble Tribunal is equally applicable.
- d. The requirement of space provision for installation of FGD was not necessarily linked to the additional study to be carried out or for preservation of notified archaeological sites. If the above contention of TSPL is accepted, then there should have been no such requirement in the TSPL's Environmental Clearance as there was no issue of plantation or marine fisheries or archaeological sites. The Hon'ble Tribunal had considered the fact that the requirement of space for FGD and funds to be earmarked meant that the FGD had already been envisaged.
- e. TSPL's contention on the amended Environmental Clearance dated 28.06.2010 of JSW is misconceived. The original Environment Clearance of JSW was dated 17.05.2007 based on whose conditions, the Hon'ble Tribunal held that the FGD was already envisaged and the Amendment dated 28.06.2010 merely confirmed the same. Further, TSPL already has the condition of low sulphur content of coal and yet the

Environment Clearance provided for space for FGD. Therefore, the distinction sought to be drawn is not of any consequence.

- f. TSPL's contention that it has already complied with all environment measures is irrelevant to the present case. The issue is only that FGD was envisaged prior to Amendment dated 07.12.2015.
- xiii) TSPL by pointing out certain distinguishing facts cannot seek to ignore the principles laid down by the Hon'ble Tribunal for consideration of change in law. It does not change the premise of the Hon'ble Tribunal's decision that the original Environmental Clearance by requiring the space for FGD and earmarking of funds, had already envisaged the requirement of FGD and the installation of FGD subsequently is not a change in law. The reasoning of the Hon'ble Tribunal would have survived even without the alleged distinguishing facts of JSW as relied on by TSPL. It is not open for TSPL to argue that there was no requirement of FGD when the Environmental Clearance specifically required that the space for FGD be provided. There would have been no need for provision of space for retrofitting of FGD if the requirement had not been envisaged.
- xiv) TSPL has not provided for funds for FGD; however, the same cannot be used to justify its claim that the FGD was not envisaged in the original Environment Clearance. It is the obligation of TSPL to comply with the terms and conditions of the Environmental Clearance and any failure on part of TSPL to do so cannot be a reason to claim that such condition was not part of the Environment Clearance. TSPL cannot take advantage of its own wrong in not providing for funds required under the Environmental Clearance.

- xv) The contention of TSPL regarding the separate fund for the FGD equipment is contrary to the decision of the Hon'ble Tribunal in JSW case. In that case also, JSW had not allocated the funds for FGD. However, that does not change the fact that the Environmental Clearance provided for such requirement. Merely because no objection was raised by any authority does not mean that the Environmental Clearance did not provide for the same.
- xvi) TSPL has relied on the decision of the Central Commission in Adani Power Limited case wherein the Central Commission has allowed the installation of FGD under change in law. The decisions of the Central Commission are not binding on the Commission. In any case, the case of Adani Power Limited was different since the original Environmental Clearance issued to Adani Power Limited provided for the installation of FGD. The Central Commission had distinguished the decision of the Hon'ble Tribunal on this specific point:

“...36. In the case of JSW, the MOE&F granted EC to JSW on 17.5.2007, subject to various conditions and one of the conditions was provision of space for installation of FGD system for removal of SO₂, if required at a later stage and for allocation of separate funds for implementation of environmental protection measures. Thereafter, at the final stage of commissioning of the project of JSW, the MOE&F by letter dated 16.4.2010 imposed a condition that FGD system should be installed before the commissioning of the said project within a period of 23 months and conveyed its EC for the project, subject to compliance of safeguards and conditions mentioned in the said letter. MERC and Tribunal had rejected the claim of JSW on the ground that there was no change in law under Article 13 of the PPA,

since the letter dated 16.4.2010 issued by MOE&F merely confirmed the requirement of installation of FGD intimated through letter dated 17.5.2007. The findings of the Tribunal in the case of JSW is that the EC dated 16.4.2010 is a mere confirmation of the earlier EC dated 17.5.2007 which is apparently based on the fact that the EC granted by MOE&F to JSW on 16.4.2010 makes reference of the EC granted by letter dated 17.5.2007 where there was a direction to make provisions for space for FGD. In the present case of the Petitioner, the EC granted by MOE&F on 20.5.2010 for Phase III was independent of the ECs granted by MOE&F on 13.8.2007 and 21.10.2008 respectively for Phases I and II of the project. However, in case of Phase III, there was no prior EC as in case of JSW and EC dated 20.5.2010 was granted by MOE&F at the first instance mandating the installation of FGD. The case of JSW is therefore distinguishable from the present case of the Petitioner and hence the judgment of the Tribunal dated 21.1.2013 cannot be made applicable in case of the Petitioner as contended by the Respondents/M/s Prayas...”

Further, the decision of the Central Commission does not take into account the MOP Letter dated 30.05.2018 which also specifically recognize if there is a mandate or envisaging of measures (such as FGD), there is no change in law. Thus, the mandate and envisaging of measures are two different considerations. Even if there is no specific mandate, the measures can still be envisaged. The JSW Case recognizes that the provision of space for FGD and costs for environmental measures means that FGD was envisaged. Therefore,

the reason for the Central Commission to distinguish the decision of the Hon'ble Tribunal in JSW Case is not applicable in the present case.

- xvii) The existing clearances require TSPL to use coal with sulphur content of not more than 0.5% and 34% ash. The emission of SO₂ as existing should be considered based on the above. Therefore, the obligation under the Amendment, if at all to be considered, is to be considered as the measures which are required for reduction from the above emission standards to the new standard of 200 mg/NM³.
- xviii) With respect to Emissions of SO₂ submitted by TSPL to CEA and the basis of CEA Report PSPCL submitted that it had vide Response dated 30.04.2018 raised specific issues on the submission by TSPL to CEA which would affect the recommendation of CEA. Further, the CEA Report has taken into account such submissions of TSPL. The contention of TSPL that the CEA would verify such submissions of TSPL is misconceived. The CEA is dealing with numerous thermal plants and its advice would be based on the information submitted by such plants and there would be no independent verification by CEA of such information.
- xix) TSPL has submitted the average emission value for Sulphur Dioxide and Nitrogen Oxide for CEA which is the same for all the units. The same is not possible. It is therefore clear that the data submitted to CEA is not actuals. The values for SO₂ do not match the CEMS data or Stack Emission Data:

Year	Unit	CEA	CEMS earlier submitted	Stack Monitoring Data earlier submitted
2014-15	Unit 2	1517	1397.75* (Average of four months)	1487.36* (Average of 4 months)

2015-16	Unit 2	1632	1355.75	1009.70
	Unit 3	1631	1373* (Average of 3 months)	750.12* (Data for 1 month)
2016-17	Unit 1	1617	1208.67* (Average of 3 months)	781.16* (Average of 5 months)
	Unit 2	1617	1608.27* (Average of 11 months)	912.61* (Average of 6 months)
	Unit 3	1617	1387.25* (Average of 11 months)	877.23* (Average of 6 months)

Thus, it is not clear on what basis the data was sent to CEA. TSPL has stated that it has furnished the annual average SO₂ and NO_x emission details to CEA “*calculated from actual sulphur content of coal, actual load & other actual process parameters by using globally followed methodology*”. Thus, instead of submitting the average of actual emissions, TSPL chose to calculate the average based on a methodology and further TSPL has not submitted the calculation arriving at the above average in the present Petition. The CEA had sought for yearly average, which naturally means the actual average and not a calculation. It is also not clear why the calculation should result in higher average than the actual emissions. The above reasoning of TSPL is completely flawed and is obviously an attempt to cover up its erroneous submission. There is no reason for variation in data submitted to CEA and the CEMS/Stack Monitoring Data. In any case, when TSPL has submitted the average data of 1617 mg/NM₃ as sought by CEA, then it is not clear why the data of 2012 mg/NM₃ or 2336 mg/NM₃ was considered by CEA.

- xx) The CEA has proceeded on the basis of emissions at 1573 to 2336 mg/NM₃ as well as 2012 mg/NM₃ with margins. The emissions for SO₂ do not match the above assumption. The Stack Monitoring data

for December 2014 to January 2017 which TSPL submits to PPCB does not match the above data. In fact the emissions are on much lower levels for most of the time. Even the CEMS data submitted at Pages 97 to 106 of the Affidavit dated 25/26.06.2018 does not match the claim. In the CEMS data, the SO₂ emissions level never exceeds 2000 mg/NM³. Further as per TSPL, the CEMS value is the highest value of daily average taken in a month. This means that there was no emission beyond 2000 mg/NM³. This would perhaps match the fact that the maximum emission would be 1992 mg/NM³ being with 0.5% sulphur content as calculated by TSPL in the Affidavit dated 25/26.06.2018. In fact it is obvious that the CEMS calculation had been wrongly represented by TSPL as average for a month which is incorrect as per the submission now made in Affidavit dated 25/26.06.2018. The figure is in fact the highest.

- xxi) TSPL had relied on two Test reports on stack emissions which provide for 2336.30 mg/NM³ and 1627.35 mg/NM³. TSPL now in its submissions has filed various Test Reports of SGS which show a range of SO₂ emissions. TSPL itself admits that based on 0.5% sulphur content in coal, the emission of SO₂ at full load should be 1992 mg/NM³ at 6% O₂ correction (the 6% O₂ has been stipulated by the MOEF vide a draft Notification dated 16.10.2017 as stated by TSPL). In view of the above, even the consideration of 2012 mg/NM³ for 0.5% sulphur content by CEA and feasibility Report is itself incorrect. However, TSPL's actual emissions as per the data now submitted exceed 2000 mg/NM³, which is not possible for 0.5% sulphur content in coal. In fact the actual emissions exceed 2000 mg/NM³ even in cases of part load. Since the SO₂ emission is based

on sulphur in coal, the part load operation should result in lower emissions since lower quantum of coal is being used. In fact the emission at 2598 on 12.08.2017 is at 370 MW, 2244 mg/NM3 on 12.07.2017 at 340 MW, 2094 mg/NM3 on 28.11.2017 at 346 MW, 2078 mg/NM3 on 12.01.2017 at 350 MW. Thus, even with nearly half load, the emission is above 2000, which is not possible with use of 0.5% sulphur coal. If at full load, the SO₂ is supposed to be 1992 mg/NM3, there is no reason for the SO₂ to cross 2000 mg/NM3 at all, let alone at part load and at just above 50% load. Further, TSPL has submitted the Flue Composition data and stack emission data to CEA by Letter dated 26.06.2018. Therefore, it is not clear whether such data was given to CEA previously and whether this data was considered by CEA for its recommendations.

xxii) The above stack emission data of SGS also does not match the stack monitoring reports submitted by TSPL to PPCB for more than three years. As per the earlier Stack Monitoring Data, the existing emissions vary between 599.67 mg/NM3 to 1769 nm/NM3. Similarly it does not match CEMS data submitted particularly, when CEMS data takes into account highest value of daily average in the month. It cannot be that suddenly in 2017-18, the emissions have increased exponentially and in fact has gone beyond even the norm for 0.5% sulphur content. TSPL is now claiming the 0.45% sulphur content as best coal, 0.5% sulphur content as performance coal and 0.6% sulphur content as worst coal. In its earlier feasibility report, TSPL had considered 0.45% sulphur content as design coal and 0.5% sulphur content as worst coal (as admitted by TSPL itself in Affidavit

dated 18.06.2018). TSPL's attempt to change the definition of worst coal is incorrect and not acceptable.

xxiii) TSPL is attempting to claim 2711 mg/NM³ based on 0.6% sulphur coal as worst coal even though it is not permissible for TSPL to use more than 0.5% sulphur coal. All of this clearly demonstrates that TSPL is either inefficiently/malafidely emitting higher SO₂ or TSPL is violating the conditions of its Environmental Clearance by using higher sulphur content coal. Either way, the claim of TSPL cannot be accepted. As submitted earlier, TSPL is only entitled to claim impact of change in law. Since it was already required to comply with 0.5% sulphur content, the emissions to be considered for the present can only be at most at 1992 mg/NM³. In fact the consideration of CEA in granting flexibility for upto 2336 mg/NM³ itself is not accurate since TSPL cannot exceed 0.5% coal and therefore 1992 mg/NM³ emissions. However TSPL in blatant contradiction is now seeking 2711 mg/NM³ as the worst coal scenario which is not acceptable.

xxiv) TSPL has also written to CEA on 16.06.2018 seeking to increase the level to 2711 mg/NM³ based on 0.6% coal. Subsequently in the letter dated 26.06.2018, TSPL has claimed that though the worst coal of 0.6% would lead to 2711 mg/NM³ as emissions, TSPL by blending imported coal and domestic coal is resulting in 2409.2 mg/NM³ but for flexibility 2711 mg/NM³ should be considered. No such issue was raised during the hearing before the Commission on 06.06.2018. In fact TSPL is raising such issues anew to CEA after the report has already been given and in fact when the Commission had sought to seek justification for 2012 mg/NM³, which itself was considered high. In contrast, TSPL is now making all sorts of claims to justify use of

0.6% sulphur content coal which is not permissible under Environmental Clearance. TSPL may be directed to immediately withdraw such letters to CEA and in any case, any recommendation based on higher emissions cannot be considered. In fact as per the EIA Report, the calculation for SO₂ is 4146 kg/hour as extrapolated by TSPL. However even as per TSPL, it has taken 4233 kg/hour. Thus, TSPL's calculation even with 0.5% sulphur coal is higher than the calculation in the EIA Report. Therefore, even the 1992 mg/NM₃ calculated may already be on a higher side than it should have been.

- xxv) The reference to NTPC Vindhayachal Stage V is not relevant for the present purpose. Firstly, NTPC's plant is under Section 62 of the Electricity Act and is a 500 MW plant. Further the other parameters of the plant, the conditions of environmental clearance and other consents etc are not known. Also, merely because NTPC has specified such data does not mean that it has been accepted by Central Commission or the Central Electricity Authority. When TSPL itself has provided the calculation at 1992 mg/NM₃, there is no justification to consider a higher emission level. In any event, the claim of TSPL for 2711 mg/NM₃ does not match the calculation in comparison to NTPC of 2415 mg/NM₃ which in turn does not match even the CEA recommendation of 2336 mg/NM₃. If TSPL seeks to install a higher capacity of FGD, the same is a choice of TSPL and therefore has to be at its cost. PSPCL and consumers cannot be burdened with such costs. Though it is not clear what the relation between ash content and SO₂ is, the assumption of 45% ash content is incorrect. TSPL is required to use coal with ash content of 34%.

xxvi) The CEA Report does not deal with the abatement of NO_x emission and does not recommend any technology for the same. In any event, the data submitted by TSPL for NO_x to CEA also does not match the CEMS data or Stack Monitoring data:

Year	Unit	CEA	CEMS	Stack Monitoring Data
2014-15	Unit 2	506	480* (Average of two months)	342.55* (Average of 4 months)
2015-16	Unit 2	567	486.40	299.92
	Unit 3	567.3	600* (Average of 3 months and no data for others)	421.18* (Average of 4 months)
2016-17	Unit 1	600.5	383.5 (Average of 2 months)	350.35* (Average of 5 months)
	Unit 2	600	449.25* (Average of 11 months)	301.36* (Average of 6 months)
	Unit 3	600	470.36* (Average of 11 months)	389.3* (Average of 6 months)

It is not clear on what basis TSPL has submitted the information to CEA. Further, the emissions values submitted to CEA for the units are similar even though the actuals vary. It is therefore clear that the data submitted to CEA is not actuals. TSPL has not provided the calculation for NO_x at 6% oxygen. The calculation given in the affidavit dated 25/26.06.2018 is not complete and does not show the final figure.

xxvii) The actual emissions as per the Stack Monitoring Data submitted to PPCB do not reflect the emissions claimed by the TSPL. From the Stack Monitoring data it transpires that , the emission of NO_x is varying from 175 to 482. Even the Stack Emissions data now submitted vide Affidavit dated 25/26.06.2018 does not match the claim of TSPL. It provides for emissions largely below 450 mg/NM³ with a couple of incidents between 450 to 460 and one at 486

mg/NM3 on 29.01.2018 at 332 MW (the emission of 646.30 mg/NM3 on 30.04.2018 is one off incident which is completely contrary to emissions during other times and particularly considering that it is 640 MW capacity and not even part load operation.) In fact even emission parameter agreed between TSPL and SEPCO is 537 mg/NM3. Therefore it is not clear how the emission level was submitted to CEA.

xxviii) TSPL itself has admitted that with tuned and coordinated operation and regulated supply of optimal amount of excess air, the emissions can be reduced by a minimum of 45%. The same is within the control of the TSPL and no additional expenditure can be considered in this regard. The combustion technology is already existing and TSPL is required to maintain it. Even the letter dated 11.12.2017 from CPCB refers to the pre combustion modification etc and recognize for SNCR, where needed. Thus, the SNCR may not be required if TSPL can control the NOx emissions otherwise. Even if TSPL can control it close to 300 mg/NM3, the capacity of SNCR required can be significantly reduced. There is a need for TSPL to satisfy the Commission on the above aspects.

xxix) TSPL also admits that the first step is to take all these measures for coordinated operations of Low NOx burners with SOFA, combustion tuning, optimal operating techniques etc. Thus, the existing emissions are without these measures. Therefore, even at its maximum emissions as per Stack Data of 486 mg/NM3, the reduction by these measures can be by minimum 45% i.e. 267.30 mg/NM3 or lower which is much below the level of 300 mg/NM3.

- xxx) The purported explanation by TSPL in the Affidavit dated 18.06.2018 at Para 7.1 is contrary to the above. In the said Affidavit, TSPL states that only combustion tuning is remaining. However, in the Affidavit dated 25/26.06.2018, it is stated that the steps required are combustion tuning and performance enhancement of existing equipment. In the said Affidavit, it was also stated that these measures would reduce the emissions by minimum of 45%. TSPL cannot go beyond its own admissions in Affidavit dated 25/26.06.2018 which is also a subsequent affidavit and in response to specific queries by the Commission.
- xxxi) TSPL has started the calculation at Para 13.6 of Affidavit dated 25/26.06.2018 with 572 and 633 mg/NM³ which has no basis, as is clear from the above submissions. TSPL has assumed the above emission levels at full load when even at half load, the emissions were only 486 mg/NM³. There is no rationale or logic to take such higher emission levels. Even the Agreement with SEPCO is based on 537 mg/NM³. On the above highly exaggerated emission level, TSPL has come to the conclusion that it would not be able to achieve the emission level of 300 mg/NM³ even with combustion control technologies etc. Further TSPL on its own has decided on 35% capacity of SNCR even though as per its own calculations, the worst coal requires abatement of only 25%. It is therefore clear that TSPL is seeking to install SNCR and of higher capacity at the cost of PSPCL to obviate the necessity of other measures, for which no compensation would be payable to TSPL and which TSPL was already required to do. The conclusion drawn by TSPL is incorrect. In

this regard, it is submitted that TSPL should also be directed to correct the submission to CEA of its NO_x emissions.

xxxii) There is a great variation in NO_x emissions for which no justification has been given. As per TSPL's own admission, the part load operation would increase the emission by 10%. Thus even assuming but not admitting the said impact, the variation should not be more than 10% which is not the case. In fact at times, the NO_x emission at times is higher at higher capacity as opposed to the lower capacity. The emission is at 273 mg/NM³ at 400 MW on 12.08.2017 or 320 mg/NM³ at 390 MW on 30.11.2017 compared to 400 mg/NM³ at 608 MW on 28.11.2017. The emissions as a whole vary from 486 mg/NM³ at 332 MW on 30.11.2017 to 215 mg/NM³ at 635 MW on 12.07.2017. The emission level at part load operation is more than double of the emission level the full load operation. Therefore, there is no explanation for such variation. Even at 370 MW, TSPL is able to keep the emission at 291 mg/NM³ on 12.07.2017. TSPL can control its emission levels without need for installation of any equipment. The costs provided by TSPL are not accepted and it is submitted that the CEA recommendation is to be awaited. The costs submitted by TSPL are not admitted.

xxxiii) With reference to Costs and CEA Report, PSPCL submitted that it is not dealing with the issues relating to costs etc in the CEA Report at this stage. However, PSPCL does not accept that opportunity costs or engineering costs etc have to be considered. PSPCL reserves its right to make further submissions at the appropriate time. In relation to NO_x, firstly PSPCL does not admit to the need for SNCR itself and

in any case does not admit the costs claimed by TSPL, particularly in the absence of any CEA analysis or recommendation in this regard. The CEA Report refers to railway siding facility to be developed. The railway siding has already been developed and this may be clarified.

xxxiv) TSPL has submitted that the participation is required only till the bid is opened. However, PSPCL would like not only to be involved in all important activities in the pre-award bidding process but also would like to regularly monitor the installation of FGD. For this purpose, PSPCL is in the process of engaging a consultant to assist and to ensure transparency in the entire process. For co-ordination with PSPCL, TSPL may communicate in writing to the office of Chief Engineer, Thermal Designs, Patiala, as it has already been doing till now.

13. **Commission's Observations, Findings and Decision**

After examining and considering all the pleadings, documents, submissions made by both the parties, the Commission notes as under:

- i) The bid cut-off date for the project was 16.06.2008 i.e. 7 days prior to the last date of submission of bids i.e. 23.06.2008.
- ii) The Ministry of Environment & Forests (MoEF) accorded Environmental Clearance to Talwandi Sabo Power Limited (TSPL) vide letter dated 11.07.2008 mentioning therein as under:

“(vi) Space provision shall be kept for retrofitting of FGD, if required at a later date.

.....

(xxv) Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.”

- iii) The Power Purchase Agreement (PPA) between TSPL and Erstwhile PSEB (now PSPCL) was signed on 01.09.2008.
- iv) TSPL commenced supply of power to PSPCL from the 1st 660 MW Unit on 05.07.2014. The 2nd & 3rd 660 MW Units were commissioned on 25.11.2015 and 25.08.2016 respectively.
- v) Ministry of Environment, Forest & Climate Change (MoEF & CC) in exercise of its power under sections 6 and 25 of the Environment (Protection) Act, 1986 amended the Environment (Protection) Rules, 1986 vide the Environment (Protection) Amendment Rules, 2015 on 07.12.2015 i.e. approx. 7 years after the bid cut off date directing the following norms for emission and water consumption for plants such as TSPL.

Year of Commissioning	Particulate Matter	SO ₂	NOx	Mercury	Water consumption
2016	50mg/Nm ³	200 mg/Nm ³ for > 500MW	300 mg/ Nm ³	0.03 mg/Nm ³	All existing CT-based plants reduce specific water consumption upto maximum of 3.5m ³ /mWh within a period of two years from the date of publication of this notification.

- vi) Ministry of Power letter dated 30.05.2018 provides as under:

“

5.1 The MoEF&CC Notification requiring compliance of Environment (Protection) Amendment Rules, 2015 dated 7th December, 2015 is of the nature of Change in Law event except in following cases:

a) Power Purchase Agreements of such TPPs whose tariff is determined under Section 63 of the Electricity Act, 2003 having bid deadline on or after 7th December, 2015; or

b) TPPs where such requirement of pollutions control system was mandated under the environment clearance of the plant or envisaged otherwise before the notification of amendment rules;

.....”

TSPL submitted that in order to comply with the Notification, it is required to incur expenditure to undertake the various measures such as installation of Flue Gas Desulphurization (FGD) equipment, Selective Non Catalytic Reduction (SNCR) technology and a water treatment system. This expenditure was not factored in at the time of bid cut off date.

TSPL submitted that Notification dated 07.12.2015 which introduced strict environmental emission standards is a 'Change in Law' under Article 13 read with Article 1.1 of the PPA, and that it is entitled to compensation in the form of tariff adjustment for Change in Law in accordance with Article 13 of the PPA as referred in the preceding paras:

TSPL submitted that the estimated capital expenditure to be incurred by it for complying with the notification is approximately Rs. 1.53 crore / MW and the operating expenses to be incurred by TSPL shall be in addition to the aforesaid estimated capital expenditure. TSPL submitted that it informed PSPCL vide its letter dated 14.01.2016 & 16.09.2016

regarding the Change in Law brought by the said notification and consequent measures to comply with the new environmental norms as required under Article 13.3 of the PPA. TSPL further submitted that the Commission's declaration that the Notification amounts to a Change in Law event and prior in-principle approval of the resultant compensation is critical for TSPL to tie up adequate financing arrangements to ensure the timely availability of funds to implement the technology up-gradation necessitated by the Notification. TSPL submitted that in the absence of the Commission's prior approval, TSPL's compliance with the Notification would not be possible or financially feasible.

In reference to the above, PSPCL in its reply dated 23.08.2017 contended that the issues raised by TSPL have to be considered with reference to the specific claims in the context of Article 13 of the PPA and denied all contentions and claims of TSPL. PSPCL contended that the petition is premature at this stage as the compensation is payable under Article 13 only after the expenditure has been incurred. TSPL has not provided any details of the computation of expenditure under each head in the petition. PSPCL contended that there is no provision in the PPA for in-principle approval before the expenditure has been incurred and the compensation, if any, can be claimed only to the extent contemplated under Article 13. PSPCL further contended that for the Change in Law, the Law as prevailing on the bid cut off date for TSPL is to be considered, including the requirement for various consents and clearances to be obtained and the conditions imposed therein. PSPCL submitted that TSPL is already meeting the emission limits for Suspended Particulate Matter, Mercury & water consumption as per Feasibility Report and has claimed

the impact of the Environmental Amendment for installation of FGD equipment for reduction in Sulphur Dioxide emission and SNCR for reduction in Nitrogen Oxide emission. TSPL's claim is based on the premise that there was no stipulation or condition for installation of FGD on the cut off date i.e. 16.06.2008. PSPCL contended that it was known to TSPL on the cut off date that the Environment Clearance is required to be obtained for the power project and the Environment Authorities could impose conditions as they think appropriate in the grant of such Environment Clearance.

PSPCL further submitted that the issue of installation of FGD as Change in Law as per a similar stipulation as mentioned above was considered by Hon'ble APTEL in JSW Energy Limited (JSW) Vs. Maharashtra State Electricity Distribution Co. Ltd and another in judgment dated 21.01.2013 in Appeal No. 105 of 2011 (JSW case). The environment clearance granted to JSW had similar conditions as in TSPL's clearance. In the aforesaid judgment in case of JSW, the Hon'ble APTEL held that the mere intimation of the stage for installation of FGD is not a change in law.

In reference to the above contentions of PSPCL, TSPL submitted that PSPCL's reliance on the JSW case is wholly erroneous and inapplicable in the instant matter. TSPL further submitted that the following are three pertinent and significant facts distinguishing TSPL's case from the JSW Case:

- i) First, the clause of TSPL's Consent that PSPCL relies on, envisages only the 'retrofitting' of an FGD system 'if required' in contradistinction to its 'installation' as applicable in the JSW Case. Similarly, the

environmental protection measures envisaged by clause (xxv) of TSPL's Consent were only those measures that had to be complied with at the time the clearance was granted, not any measures introduced in future ad infinitum.

ii) Second, several factors that weighed with Hon'ble APTEL in the JSW Case are absent in this case. These are outlined below:

a) In the case at hand, unlike the JSW Case, the Environment (Protection) Rules, 1986 were modified by the Notification dated 07.12.2015 and far stricter emission standards than those hitherto applicable were imposed by the Notification.

b) In the JSW Case, the amount of permissible sulphur content was significantly higher than TSPL's plant, for which an upper limit of 0.5% has been set. Pertinently, SO_x emissions are directly proportional to sulphur content in coal.

c) In point No. (ii) of JSW's environmental clearance, it is mentioned that "the detailed study regarding the impact of the project, if any, on Alphanso mango and marine fisheries as recommended in the report of Dr. B.S Konkan Krishi Vidyapith shall be undertaken. Based on the same, additional safeguard measures as may be required will be taken by the proponent with prior approval of the Ministry of Environment and Forests." As a result, taking of additional safeguards to maintain ecological balance was clearly contemplated in JSW's environmental clearance, unlike the Consent granted to TSPL.

d) In the JSW Case, the environmental clearance envisaged the installation of an FGD system in order to preserve notified archaeological sites, no such stipulation exists in this case.

e) As per the amended Environmental Clearance granted to JSW on 28.6.2010, one important condition was as follows:

“JSW shall reduce the power generation and /or change to a fuel with low Sulphur content or close the plant, if so required in case the SO₂ levels exceed the prescribed standards till the installation of FGD.”

This clearly indicates that JSW's amended environmental clearance envisaged the installation of FGD. No such stipulation exists in case of TSPL.

iii) Finally, TSPL has complied with all environmental protection measures contemplated by the Consent granted to it, such as the installation of a hybrid electrostatic precipitator, Fabric Filter system to ensure PM emissions less than 50mg/Nm³, High concentration slurry disposal system, Ash dyke, waste water/ sewage water treatment system, Zero discharge system, Ambient Air quality stations, Chimney Emission monitoring stations, Dust suppression and dust extraction system, etc. Therefore, TSPL is fully cognizant of its obligations under the Consent, and categorically states that the de novo installation of a new FGD system and other systems clearly falls beyond the ambit of the Consent. Hence, the JSW Case has no application whatsoever in the present case.

In rebuttal, PSPCL contended that the Environment Clearance granted to JSW had similar conditions as cited in TSPL's Clearance. TSPL

has sought to distinguish the above judgment of Hon'ble APTEL on various grounds. However, it is submitted that the rationale of the judgment is that when the Environmental Clearance required the provision of space for installation of FGD and further, required that separate funds must be allocated for environment measures, then the installation of FGD was already contemplated and the subsequent communication is merely a confirmation of the requirement. The various distinguishing features sought to be raised by TSPL do not impact the above basic finding of Hon'ble APTEL as explained hereunder:

- a) TSPL is seeking to draw a specious and frivolous distinction between retrofitting and installation of FGD. The term 'retrofitting' gives greater emphasis on the fact that FGD was envisaged.
- b) The issue of Modification of Environment rules being the reason for requirement of FGD does not take away the basic principle of the decision of Hon'ble APTEL that the FGD was already envisaged at the time of Environmental Clearance. Once the FGD was already envisaged, the subsequent confirmation of the requirement of FGD cannot be considered as change in law. This contention of TSPL is also negated specifically by the Ministry of Power in its Letter dated 30.05.2018 which provided that if FGD was already envisaged, there is no change in law. It has been provided in the aforesaid letter as under:-

"5.1 The MoEFCC Notification requiring compliance of Environment (Protection) Amendment Rules, 2015 dated 7th December, 2015 is of the nature of Change in Law event except in following cases:

....

(b) TPPs where such requirement of pollutions control system was mandated under the environment clearance of the plant or envisaged otherwise before the notification of amendment rules”

- c) TSPL has sought to distinguish the case of JSW based on permissible sulphur content being higher for JSW than TSPL. If the requirement of FGD in JSW case was because of higher permissible sulphur content, then the condition of space for FGD should never have been included in the Environment Clearance for TSPL. The fact is that both TSPL and JSW's Environment Clearance provided for space for FGD and cost of environment measures based on which Hon'ble APTEL had given its finding. Therefore, both cases being similar, the rationale of Hon'ble APTEL is equally applicable.
- d) The requirement of space provision for installation of FGD was not necessarily linked to the additional study to be carried out or for preservation of notified archaeological sites. If the above contention of TSPL is accepted, then there should have been no such requirement in the TSPL's Environmental Clearance as there was no issue of plantation or marine fisheries or archaeological sites. Hon'ble APTEL had considered the fact that the requirement of space for FGD and funds to be earmarked meant that the FGD had already been envisaged.
- e) TSPL's contention on the amended Environmental Clearance dated 28.06.2010 of JSW is misconceived. The original Environment Clearance of JSW was dated 17.05.2007 based on whose conditions, Hon'ble APTEL held that the FGD was already envisaged and the Amendment dated 28.06.2010 merely confirmed the same. Further,

TSPL already has the condition of low sulphur content of coal and yet the Environment Clearance provided for space for FGD. Therefore, the distinction sought to be drawn is not of any consequence.

- f) TSPL's contention that it has already complied with all environment measures is irrelevant to the present case. The issue is only the FGD was envisaged prior to Amendment dated 07.12.2015.

PSPCL submitted that TSPL by pointing out certain distinguishing facts cannot seek to ignore the principles laid down by Hon'ble APTEL for consideration of change in law. It does not change the premise of Hon'ble APTEL's decision that the original Environmental Clearance by requiring the space for FGD and earmarking of funds, had already envisaged the requirement of FGD and the installation of FGD subsequently is not a change in law. The reasoning of Hon'ble APTEL would have survived even without the alleged distinguishing facts of JSW as relied on by TSPL. It is not open for TSPL to argue that there was no requirement of FGD when the Environmental Clearance specifically required that the space for FGD be provided. There would have been no need for provision of space for retrofitting of FGD if the requirement had not been envisaged.

PSPCL further submitted that TSPL has not provided for funds for FGD, however, the same cannot be used to justify its claim that the FGD was not envisaged in the original Environment Clearance. It is the obligation of TSPL to comply with the terms and conditions of the Environmental Clearance and any failure on part of TSPL to do so cannot be a reason to claim that such condition was not part of the Environment

Clearance. TSPL cannot take advantage of its own wrong in not providing for funds required under the Environmental Clearance.

PSPCL submitted that the contention of TSPL regarding the separate fund for the FGD equipment is contrary to the decision of Hon'ble APTEL in JSW case. In that case also, JSW had not allocated the funds for FGD. However, that does not change the fact that the Environmental Clearance provided for such requirement. Merely because no objection was raised by any authority does not mean that the Environmental Clearance did not provide for the same.

Considering the above submissions of PSPCL and TSPL with regard to Hon'ble APTEL's judgment dated 21.01.2013 in Appeal no. 105 of 2011 in JSW Energy Limited (JSW) Vs. Maharashtra State Electricity Distribution Co. Ltd., the Commission finds that the facts in the case of JSW are quite similar to the present case of the petitioner and hence the judgment of Hon'ble APTEL dated 21.01.2013 is relevant to the present case.

The Commission notes that TSPL, in support of its contention that the obligation to install FGD equipment introduced vide the MoEF Notification dated 07.12.2015 constitutes change in law, has relied upon the findings of CERC in its Order dated 28.03.2018 in the case of Adani Power Limited versus Uttar Haryana Bijli Vitran Nigam Limited and Anr. in Petition no. 104/MP/2017. The relevant portion of the said order is as under:

“32. It is evident from the above that the Petitioner had not earmarked funds for installation of FGD in the year-wise expenditure submitted to MOE&F on environmental protection measures in compliance with the ECs dated 13.8.2007 and 21.10.2008. It is pertinent to mention that MOE&F had also not raised any objections for not earmarking funds towards installation of FGD in terms of the ECs dated 13.8.2007 and 21.10.2008 respectively. In this background, we are of the view that the installation of FGD in Phases I & II of the project was not mandatory, except for space provisions for FGD and the Petitioner could have reasonably assumed that similar condition would only be imposed for Phase III of the project. Accordingly, the Petitioner could not have been expected to factor the cost of installation of FGD in the bid for Phase III. We therefore conclude that the installation of FGD was not a mandatory requirement as on the cut-off date (19.11.2007) and was made mandatory post the cut-off date vide the EC dated 20.5.2010 granted to the Petitioner for Phase III (units 7 to 9) of Mundra UMPP...

33. In view of the above, the condition mandating the installation of FGD in Phase III units of the Petitioner falls within the definition of change in law under Article 13.1.1(i) of the PPA. Consequent upon the above, the Petitioner is entitled for reimbursement of the expenditure for installation of FGD in Phase III of the project in terms of the EC dated 20.5.2010.”

TSPL has submitted that a perusal of the above judgment of CERC makes it clear that where funds are not required to be earmarked for an FGD system under an environmental clearance, and no objections in this

regard are ever raised by the MoEF, a new requirement for FGD installation constitutes a change in law.

In response, PSPCL contended that the decisions of the CERC are not binding on the Commission. PSPCL further contended that the case of Adani Power Limited was different since the original Environmental Clearance issued to Adani Power Limited provided for the installation of FGD. The CERC had distinguished the decision of Hon'ble APTEL on this specific point as under:

“...36. In the case of JSW, the MOE&F granted EC to JSW on 17.5.2007, subject to various conditions and one of the conditions was provision of space for installation of FGD system for removal of SO₂, if required at a later stage and for allocation of separate funds for implementation of environmental protection measures. Thereafter, at the final stage of commissioning of the project of JSW, the MOE&F by letter dated 16.4.2010 imposed a condition that FGD system should be installed before the commissioning of the said project within a period of 23 months and conveyed its EC for the project, subject to compliance of safeguards and conditions mentioned in the said letter. MERC and Tribunal had rejected the claim of JSW on the ground that there was no change in law under Article 13 of the PPA, since the letter dated 16.4.2010 issued by MOE&F merely confirmed the requirement of installation of FGD intimated through letter dated 17.5.2007. The findings of the Tribunal in the case of JSW is that the EC dated 16.4.2010 is a mere confirmation of the earlier EC dated 17.5.2007 which is apparently based on the fact that the EC granted by MOE&F to JSW on 16.4.2010 makes reference of the EC granted

by letter dated 17.5.2007 where there was a direction to make provisions for space for FGD. In the present case of the Petitioner, the EC granted by MOE&F on 20.5.2010 for Phase III was independent of the ECs granted by MOE&F on 13.8.2007 and 21.10.2008 respectively for Phases I and II of the project. However, in case of Phase III, there was no prior EC as in case of JSW and EC dated 20.5.2010 was granted by MOE&F at the first instance mandating the installation of FGD. The case of JSW is therefore distinguishable from the present case of the Petitioner and hence the judgment of the Tribunal dated 21.1.2013 cannot be made applicable in case of the Petitioner as contended by the Respondents/M/s Prayas...”

PSPCL submitted that the decision of CERC does not take into account the MOP letter dated 30.05.2018 which also specifically recognizes that if there is a mandate or envisaging of measures (such as FGD), there is no change in law. The mandate and envisaging of measures are two different considerations. Even if there is no specific mandate, the measures can still be envisaged.

Considering the above submissions / contentions of the parties with regard to CERC’s judgment dated 28.03.2018 in the case of Adani Power Limited versus Uttar Haryana Bijli Vitran Nigam Limited & Anr. and keeping in view para 5.1 (b) of the MOP letter dated 30.05.2018, the Commission is of the view that the facts in the case of Adani Power Limited are different than the present case of TSPL. As would be seen in case of TSPL, provision of the space for FGD and allocation of funds for environmental protection measures, which

were to be included as part of project cost & were not to be diverted for any other purposes and year wise reporting of expenditure was to be made to the Ministry, were envisaged at the inception stage of the project. However, in case of Phase-III of Adani Power Project, there was no prior environmental clearance. Hence the Commission considers that CERC's judgment dated 28.03.2018 is not relevant in the present case.

The Commission observes that the Environmental Clearance was accorded to TSPL by Ministry of Environment and Forests vide letter dated 11.07.2008 subject to implementation of the various terms and conditions, which included the conditions hereunder:

“(vi) Space provision shall be kept for retrofitting of FGD, if required at a later date.

.....

(xxv) Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.”

The Commission finds the following clauses of the bidding documents comprising the RfQ, RfP and PPA to be relevant for deciding the issue(s) involved:

As per clause 5.5 of the PPA, TSPL was responsible for obtaining consents (other than those required for the Interconnection and Transmission Facilities and the Initial Consents) required for developing, financing, constructing, operating and maintenance of

the project. Not only that, TSPL was responsible for obtaining, maintaining and renewing the initial consents and also for fulfilling all conditions specified therein. TSPL was originally incorporated by the erstwhile PSEB as a Special Purpose Vehicle for setting up the project and was to arrange Environmental Clearance, acquisition of land for the project, long-term coal linkage and water linkage as a pre-requisite at the bidding stage. Clause 5.5 of the PPA is quoted below:

“5.5 Consents

The Seller shall be responsible for obtaining all Consents (other than those required for the Interconnection and Transmission Facilities and the Initial Consents) required for developing, financing, constructing, operating and maintenance of the Project and maintaining/ renewing all such Consents in order to carry out its obligations under this Agreement in general and this Article 5 in particular and shall supply to the Procurer promptly with copies of each application that it submits, and copy/ies of each consent/approval/license which it obtains. For the avoidance of doubt, it is clarified that the Seller shall also be responsible for maintaining / renewing the Initial Consents and for fulfilling all conditions specified therein.”

That apart, Clause 3.1.2 (i) of the PPA, TSPL shall have received the initial consents either unconditionally or subject to conditions which do not materially prejudice its right or performance of its obligations under the agreement. Thus, these clauses of the PPA cast the burden on TSPL. Clause 3.1.2 (i) of the PPA is quoted below:

“3.1.2

i) the Seller shall have received the Initial Consents as mentioned in Schedule 2, either unconditionally or subject to conditions which do not materially prejudice its rights or the performance of its obligations under this Agreement.”

Further, clause 2.7.2 “Bidder to inform himself fully” of the RfP reads as under:

“2.7.2.1 The Bidder shall make independent enquiry and satisfy itself with respect to all the required information, inputs, conditions and circumstances and factors that may have any effect on his Bid. While submitting the Bid the Bidder shall be deemed to have..... examined the laws and regulations in force in India and fixed its price taking into account all such relevant conditions and also the risks, contingencies and other circumstances which may influence or affect the supply of power. Accordingly, the Bidder acknowledges that, on being selected as Successful Bidder and on acquisition of the Seller, the Seller shall not be relieved from any of its obligations under the RfP Project Documents nor shall the Seller be entitled to any extension of time or financial compensation by reason of the unsuitability of the Site for whatever reason.

2.7.2.2 In their own interest, the Bidders are requested to familiarize themselves with the Electricity Act, 2003, the income Tax Act, 1961, the Companies Act, 1956, the Customs Act, the Foreign Exchange Management Act, IEGC, the regulations framed by regulatory commissions and all other related acts, laws, rules and regulations prevalent in India.

.....”

Also, the Bidders were required to give an undertaking as per Annexure-6 of the RfP document for unconditional acceptance to the RfP Project Documents issued by Procurer/Authorised Representative as a part of the RfP.

As per the RfQ and Schedule 2 of the PPA, the following were the initial consents to be available at the time of bidding:

- i) Acquisition of land required for the project;
- ii) Environmental Clearance;
- iii) Long-term coal linkage;
- iv) Water linkage.

As the Environmental Clearance was not available on the cut-off date, all the participating bidders chose to submit their bids without the same. As per clause 2.7.2 "*Bidder to inform himself fully*" of the RfP, the Bidder was to make independent enquiry and satisfy itself with respect to all the required information, inputs, conditions and circumstances and factors that may have any effect on his Bid. While submitting the Bid, the Bidder is deemed to have examined the laws and regulations in force in India and fixed its price taking into account all such relevant conditions and also the risks, contingencies and other circumstances which may influence or affect the supply of power. The Bidders were to familiarize themselves with the Electricity Act, 2003, the Income Tax Act, 1961, the Companies Act, 1956, the Customs Act, the Foreign Exchange Management Act, IEGC, the regulations framed by regulatory commissions and all other related acts, laws, rules and regulations prevalent in India.

The cut-off date of the project was 16.06.2008 and the Environmental Clearance was granted on 11.07.2008. In the absence of the Environmental Clearance on the cut-off date, all the bidders shall have made their due diligence with regard to the Environmental Clearance in terms of the bidding documents and relied upon the Environmental Clearances being granted by MoEF to such projects at that point of time including JSW project.

Evidently, TSPL's bidding company (Sterlite Energy Limited) did not raise any objection on the receipt of Environmental Clearance for the project on 11.07.2008 with regard to the direction by MoEF for space provisioning for retrofitting of FGD at a later stage and allocating funds for the same. Also, the bidder after having been declared successful in the bidding process, opted to sign the Share Purchase Agreement and acquired 100% shares of TSPL and signed the PPA on 01.09.2008 with the erstwhile PSEB (now PSPCL) in its own wisdom without raising any objection/seeking clarification with regard to the requirement of providing funds for retrofitting of FGD at a future date having been made in the Environmental Clearance dated 11.07.2008, thereby accepting the same at bidding stage.

Accordingly, the Commission is of the view that granting the relief as sought by TSPL with regard to Change in Law would also defeat the sanctity of the competitive bidding process as the other bidders who had participated in the competitive bidding would be prejudicially affected.

As noted by the Commission in the foregoing paras, the Environmental Clearance granted to TSPL project is similar to JSW

Project as is evident from the Environmental Clearance granted to JSW project on 17.05.2007, as brought out below:

“.....

(iii) Space provision shall be made for installation of FGD of requisite efficiency of removal of SO₂, if required at later stage.

.....

(xx) Separate funds should be allocated for implementation of Environmental protection measures along with item wise break up. These cost should be included as part of the project cost. The funds earmarked for the environment protection measures should not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.”

Perusal of the Environmental Clearance granted to TSPL project as brought out in the foregoing paras and JSW project as brought above clearly reveals that there is no difference in the two with regard to FGD.

In fact a plain reading of condition (xxv) of the EC granted for TSPL project and condition (xx) of the EC granted for JSW project reveals that the language in TSPL case is rather specific in so much as it uses the word ‘shall’ while directing for (i) allocation of funds for implementation of environmental protection measures along with item-wise break-up, (ii) including these cost as part of the project cost and (iii) not diverting the said funds for other purposes, as compared to JSW case where the word used is ‘should’ for similar directions.

Admittedly, TSPL has kept the space provision for retrofitting of FGD for unit-1, 2 & 3 of the project as stated in its Half Yearly Environmental Clearance Compliance Report for the period of April,

2013 to September, 2013 submitted to MoEF vide its letter dated 07.11.2013. However it did not make provisions of funds for the same for installing FGD at a future date as envisaged in the Environmental Clearance. Under the Environmental Clearance dated 11.07.2008, the direction was issued to TSPL to keep the space for retrofitting of FGD if required at later stage and also to allocate separate funds inter alia for this purpose which shall not be diverted for any other purpose.

According to TSPL, the requirement of retrofitting of FGD / SNCR to comply with the new norms as mandated by Ministry of Environment, Forest and Climate Change, vide notification dated 07.12.2015 is a Change In Law. Condition (xxv) of the Environmental Clearance dated 11.07.2008 mandated TSPL to allocate separate funds for implementation of the Environmental Protection Measures. It also provided a condition that the said funds shall not be diverted for any other purpose. Clause (xxv) of the Environmental Clearance is quoted below:

“(xxv) Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.”

The Commission notes that conditions (vi) & (xxv) of the Environmental Clearance dated 11.07.2008 mandated that TSPL shall provide space to retrofit FGD if required at a later date and shall allocate funds for implementation of all the environmental protection

measures. It also provided that TSPL shall not divert the said funds for any other purpose. The earmarking of funds for all environmental protection measures had to be done at the beginning. The details of environmental protection measures was not spelt out but obviously flowed from the conditions mentioned in the Environmental Clearance. TSPL was also enjoined not to divert the funds since only expenditure was to be reported to the Ministry. The Ministry wanted to know only about the expenditure made on various environmental protection measures and not about the earmarking of funds. Earmarking of funds and not diverting the funds for other purposes was the responsibility of TSPL. Though TSPL complied with condition (vi) for providing space for retrofitting of FGD, it did not allocate funds for retrofitting FGD system. Thus, TSPL did not fully comply with the requirement of FGD as contemplated in the Environmental Clearance.

If it had considered that the condition for providing space for retrofitting FGD at a later stage was onerous and adverse / prejudicial to its interests the bidding company of TSPL (Sterlite Energy Ltd.) could have opted to withdraw / cancel its bid at that time on 01.09.2008. Having failed to act promptly at the appropriate time it cannot at a belated stage now make a case to not fulfill its contractual obligations and take shelter under the Change in Law provisions.

TSPL submitted that as per the Environmental Clearance dated 11.07.2008, it was required to install FGD in future and not at that stage, and therefore, the installation of FGD system to comply with the new norms as mandated by Ministry of Environment, Forest and Climate Change, vide notification dated 07.12.2015 amounts to

change in law as per the PPA signed between TSPL & PSPCL and consequently, TSPL is entitled to claim the financial benefits of the said Change in Law. In case the contention of TSPL that the Environmental Clearance did not require installation of FGD is considered correct, then the Commission is of the opinion that the Environmental Clearance would have either not included any mention of FGD – space or retrofitting or categorically stated that FGD is not required to be retrofitted. In that case, the directions for funds allocation would not have been issued. As such, the Commission is of the view that the mandate of MoEF was not complied with in totality.

The Commission notes that it has been provided in the Ministry of Power Letter dated 30.05.2018 that the MoEF&CC Notification dated 7th December 2015 requiring compliance of Environment (Protection) Amendment Rules, 2015 is of the nature of Change in law event except in the cases of TPPs where such requirement of pollutions control system was mandated under the Environmental Clearance of the plant or envisaged otherwise before the notification of amendment rules. In this particular case without doubt the retrofitting of FGD was envisaged much before the notification dated 07.12.2015 in the Environmental Clearance dated 11.07.2008.

Accordingly, on the basis of discussion above and careful perusal of the relevant clauses of the bidding documents comprising RfQ, RfP and PPA, the Environmental Clearance dated 11.07.2008, the Notification dated 07.12.2015 issued by MoEF & CC and para 5.1 (b) of Ministry of Power letter dated 30.05.2018, the Commission holds that there is no “Change in Law” as contemplated in the PPA. The

Notification dated 07.12.2015 issued by MoEF & CC only confirms the requirement of installation of the FGD intimated through the Environmental Clearance dated 11.07.2008. As such, there is no Change in Law as claimed by TSPL in the instant case.

Further to MoEF & CC notification dated 07.12.2015 which is applicable for all operational thermal power stations, Central Pollution Control Board (CPCB) vide letter dated 11.12.2017 issued directions to TSPL under Section 5 of the Environment (Protection) Act, 1986 for compliance of the emission limit notified vide notification No. S.O. 3305 (E) dated 07.12.2015. In the aforesaid letter it has been directed by CPCB that TSPL shall install FGD by 31.12.2019 in Unit 1, 2 & 3 respectively so as to comply with SO₂ emission limit. The Commission in its Interim Order dated 11.06.2018 has already passed directions to TSPL that since the FGD has to be installed by December 2019 as per CPCB and recommendations of CEA, TSPL should initiate the process for the same. The Commission further directs that the requirement to install FGD by the specified date be complied with by TSPL.

The Commission notes that TSPL submitted that the estimated capital expenditure to be incurred by it for complying with the MoEF&CC Notification dated 07.12.2015 is approximately Rs. 1.53 crore per MW and the operating expenses to be incurred shall be in addition to the aforesaid estimated capital expenditure.

The Commission further notes that Central Electricity Authority vide its letter no.44/FGD/UMPP/CEA/2018/735 dated 25.09.2018 addressed to SE/Projects, Thermal Design, PSPCL with copy to PSERC informed that CEA vide letter dated 16.05.2018 had provided recommendation report to TSPL wherein it was also specified that TSPL would determine the cost of retrofitting of FGD system through competitive bidding in consultation with PSPCL. The maximum indicative cost i.e. CAPEX mentioned in the report is 0.5 crore per MW. CEA vide its aforesaid letter dated 25.09.2018 has informed that the prices have further come down to 0.4 crore per MW and suggested that while closing the cost for retrofitting FGD system, the present market conditions should be looked into for an optimum cost.

As regards the NOx emissions limit, CPCB in its aforesaid letter dated 11.12.2017 has directed TSPL to take immediate measures like installation of low NOx burners, provide Over Fire Air (OFA) system etc. and achieve progressive reduction so as to comply NOx emission limit by the year 2019. **CEA in its report has not indicated any technology for meeting the NOx emission limit. In view of the above, the Commission is not inclined to consider the plea for the installation of SNCR as claimed by TSPL to comply with NOx emissions specified in the MoEF & CC notification dated 07.12.2015. TSPL is directed to comply with the directions of CPCB in this regard.**

The petition is disposed of in terms of above with no costs.

Sd/-
(Anjuli Chandra)
Member

Sd/-
(S.S. Sarna)
Member

Sd/-
(Kusumjit Sidhu)
Chairperson

Chandigarh
Dated: 21.12.2018