



**“3A. Additional Definitions:** In these Regulations, unless the context otherwise requires, the following definitions shall be used in respect of the integrated energy storage system:-

- (1) **'Auxiliary energy consumption for integrated energy storage control system'** or **'AUX(ess)'** means the quantum of energy consumed by auxiliary equipment of the integrated energy storage system of the thermal generating station or transmission system in addition to the auxiliary energy consumption under clauses (7) and (8) of Regulation 3 of the Principal Regulations.
- (2) **'Battery cell'** means the electrochemical device of the battery energy storage system that stores electrical energy in chemical energy and converts chemical energy into electrical energy, which consists of a positive (cathode) and a negative (anode) electrode with the capability to generate electricity.
- (3) **'Battery cycle'** in respect of a battery energy storage system means the process beginning with charging to its maximum rating and ending with discharging to its minimum specified rating to complete one cycle of a battery energy storage system.
- (4) **'C-rate – charge or discharge rate'** means the rate of discharge from or charging of the battery energy storage system, relative to its total capacity per hour and is expressed in terms of one-hour discharge as a fraction of C-rate.
- (5) **'Date of commercial operation of the integrated energy storage system '** or **'COD(ess)'** in relation to the energy storage system shall have the same meaning as specified in Chapter 5 of the Grid Code-
- (6) **'Declared capacity of Integrated Energy Storage System'** or **'DC(ess)'** in relation to an integrated energy storage system integrated with the generating station or transmission system means, the capability to deliver ex-bus electricity in MW declared by such generating company or transmission licensee, necessarily during the peak hours of electricity demand of the day, duly taking into account the stored electricity after successful charging, and subject to further qualification in these Regulations.
- (7) **'Energy storage system' or 'ESS'** shall have the same meaning as specified in clause (46) of Regulation 3 of Grid Code.
- (8) **'Integrated energy storage system'** means the energy storage system co-located with the generating station or the transmission system, as the case may be, connected to a common bus-bar, including a dedicated line, if any, and for the purpose, including safe and reliable operation of the grid or for deferring the transmission investment and for enhancing the flexible operation of the generating station, as the case may be, as per the requirement of the National Load Despatch Centre or beneficiaries or the designated ISTS customers, as the case may be.
- (9) **'Maximum continuous rating of integrated energy storage system'** or **'MCR(ess)'** means the maximum continuous amount of electricity (in MW) of integrated energy storage system guaranteed by the manufacturer at rated parameters for the specific period (in hours).
- (10) **'Plant Availability Factor of energy storage system'** or **'PAF(ess)'** in relation to an integrated energy storage system with generating station for any period means the average of the daily declared capacities during peak hours (DCs) for all the days during the period expressed as a percentage of the installed capacity in MW less the auxiliary energy consumption as per these regulations;

(11) **‘Rated capacity’** in respect of an integrated energy storage system means the total amount of energy that can be stored in the integrated energy storage system as per the specifications of the original equipment manufacturer, expressed in terms of kilowatt-hours (kWh) or megawatt-hours (MWh).

(12) **‘Round trip efficiency of integrated energy storage system’** or **‘RTE(ess)’** in relation to a period means the quantum of energy delivered by the integrated energy storage system of the generating station or the transmission system as a percentage of the energy supplied for charging the integrated energy storage system which shall be higher of 85% or actual during the month.

(13) **‘State of charge’** in respect of the energy integrated storage system means the amount of the charge an integrated energy storage system has available for the supply of electricity at a given time and is expressed in percentage capacity with reference to its installed capacity.”

**5. Amendment to Regulation 5 of the Principal Regulations:** In Regulation 5 of the Principal Regulations, the following new clause (3) shall be inserted, namely:—

“(3) The date of commercial operation of the integrated energy storage system installed in an existing generating station or the transmission system shall be declared by the generating company or the transmission licensee, in accordance the Chapter 5 of the Grid Code, except where the integrated energy storage system is commissioned along with the new generating station or new transmission system as a part of the original scope.”

**6. Amendment to Regulation 8 of the Principal Regulations:** In Regulation 8 of the Principal Regulations: —

6.1 In clause (1), —

- i) the words “generating station and emission control system” shall be substituted for the words “generating station, emission control system and integrated energy storage system”;
- ii) the words “and integrated energy storage system, wherever applicable,” shall be inserted after the words “a transmission system” and before the words “may be determined”;
- iii) the words “or integrated energy storage system” shall be inserted after the words “associated communication system”;
- iv) after proviso (iii), the following proviso (iv) shall be inserted, namely: —

“The generating company or transmission licensee shall apply for the determination of a supplementary tariff for an integrated energy storage system installed in a coal, gas, or lignite-based thermal generating station or transmission system, as the case may be, in accordance with these Regulations, not later than 30 days from the date of commercial operation of such integrated energy storage system.”

6.2 After clause (5), the following clause (5a) shall be inserted, namely: —

“(5a) Supplementary energy charge of the integrated energy storage system shall be computed based on the energy charge rate of the electricity sourced from the

associated generating station or the tariff of the electricity procured for charging the integrated energy storage system based on sources other than the associated generating station, as the case may be, adjusted for the round-trip efficiency of the integrated energy storage system.”

**7. Amendment to Regulation 9 of the Principal Regulations:** In Regulation 9:—

- i) After clause (3), a new clause (3a) shall be inserted, namely:—

“(3a) In case an integrated energy storage system is installed with the generating station or unit thereof, transmission system or its sub-station, an application shall be made for the determination of supplementary tariff (fixed storage charges with or without variable energy charges) based on the actual capital expenditure duly certified by the Auditor.”

- ii) After clause (4), a new clause (4a) shall be inserted, namely:—

“(4a) Where the generating company or the transmission licensee has installed an integrated energy storage system at its generating stations or the transmission system, as the case may be, the generating company or the transmission licensee shall file a petition for determination of the supplementary tariff of integrated energy storage system, not later than 30 days from date of commercial operation of the integrated energy storage system in accordance with the provision of these Regulations.”

**8. Amendment to Regulation 10 of the Principal Regulations:** In Regulation 10 :—

- i) In clause (1), after the words “for an integrated mine” and before the words “or the transmission licensee”, the words “or an integrated energy storage system” shall be inserted.

- ii) After clause (1), the following explanation shall be added:-

“Explanation: The tariff filing forms specified in Annexure-I shall be used for filing an application for the determination of supplementary tariff separately, after suitable modification wherever required.”

**9. Amendment to Regulation 11 of the Principal Regulations:** In Regulation 11 of the Principal Regulations: —

- i) The existing clause shall be numbered (1).

- ii) Clause (1) of Regulation 11 of the Principal Regulations, after the words “or the transmission licensee” and before the words “undertaking any additional capitalization”, the words “or for an integrated energy storage system” shall be inserted.

- iii) After clause (1), the following new clause (2) shall be inserted, namely: —

“(2) The generating company or the transmission licensee, undertaking any additional capitalization on account of integrated energy storage system, for a generating station or a sub-station, as the case may be, may file petition for in-principle approval for incurring such expenditure after prior notice to the beneficiaries or the long-term

customers, as the case may be, along with underlying assumptions, estimates and justification for such expenditure.”

**10. Amendment to Regulation 13 of the Principal Regulations:** In Regulation 13 of the Principal Regulations: —

- i)* In sub-clause (c) of clause (1), after the words “emission control system” and before the words “as admitted by the Commission”, the words “, or the integrated energy storage system” shall be inserted.
- ii)* In clause (3), after the words “generating station or a unit thereof”, the words “, or the integrated energy storage system” shall be inserted.

**11. Amendment to Regulation 14 of the Principal Regulations:** In Regulation 14 of the Principal Regulations, a new clause shall be inserted, namely: —

“(6) The supplementary tariff consisting of supplementary fixed storage charges and supplementary energy charges, on account of the installation of an integrated energy storage system in generating stations or transmission system, as the case may be, shall be determined by the Commission separately.”

**12. Amendment to Regulation 15 of the Principal Regulations:** In Regulation 15 of the Principal Regulations, after clause (2), the following new clause (2a) shall be inserted: —

“(2a) **Supplementary storage charges of energy storage system:** Supplementary capacity charges of the integrated energy storage system shall be derived based on the Annual Fixed Cost of energy storage system (AFCess). The Annual Fixed Cost for the integrated energy storage system shall consist of the components as listed in sub-clauses (a) to (e) of clause (1) of this Regulation.”

**13. Amendment to Regulation 16 of the Principal Regulations:** In Regulation 16 of the Principal Regulations: —

- i)* The existing clause shall be numbered clause (1),
- ii)* After clause (1), the following new clause (2) shall be inserted:
 

“(2) The supplementary energy charges of the integrated energy storage system installed in a generating station or transmission system, as the case may be, shall consist of the cost of the electricity sourced, after adjustment of round-trip efficiency and auxiliary energy consumption of the energy storage system, as under:

  - a) Energy charges of the generating station if it is sourced from the same generating station; or
  - b) Energy charges of the other generating station if it is sourced from the share of the common beneficiaries; or
  - c) Cost of electricity procured at the metering point of the generating station derived based on the approved tariff applicable at the generating station or at the competitive rate from the open market.”

- 14. Amendment to Regulation 18 of the Principal Regulations:** In Regulation 18 of the Principal Regulations, after clause 6, a new clause (7) shall be inserted, namely: —

“(7) Any expenditure incurred for the energy storage system during the tariff period, as may be admitted by the Commission as additional capital expenditure of the generating station or transmission system for the determination of supplementary tariff, shall be serviced in the manner specified in clause (1) of this Regulation.”

- 15. Amendment to Regulation 23 of the Principal Regulations:** In Regulation 23 of the Principal Regulations, after clause (iv) of the proviso, a new clause (v) shall be inserted, namely: —

“v. where the integrated energy storage system is installed in the generating station or the transmission system, the norms of initial spares shall be:

- a) as applicable for coal or lignite-based thermal generating stations, as the case may be, for the integrated energy storage system installed in the generating station;
- b) as applicable for the existing transmission substation for the integrated energy storage system installed in the transmission system.”

- 16. Amendment to Regulation 24 of the Principal Regulations:** In clause (1) of Regulation 24 of the Principal Regulations, after the words “an existing project” and before the words “incurred or projected to be incurred”, the words “including integrated energy storage system” shall be inserted.

- 17. Amendment to Regulation 25 of the Principal Regulations:** In clause (1) of Regulation 25 of the Principal Regulations, after the words “a new project” and before the words “on the following counts”, the words “including integrated energy storage system” shall be inserted.

- 18. Amendment to Regulation 26 of the Principal Regulations:** In clause (1) of Regulation 26 of the Principal Regulations, after the words “the communication system” and before the words “incurred or projected to be incurred”, the words “the integrated energy storage system” shall be inserted.

- 19. Amendment to Regulation 27 of the Principal Regulations:** In clause (1) of Regulation 27 of the Principal Regulations, the words “or the transmission licensee” shall be deleted.

- 20. Insertion of New Regulations 29A and 29B of the Principal Regulations:** After Regulation 29 of the Principal Regulations, a new Regulation 29A shall be inserted, namely:—

**“29A. Additional Capitalization on account of an integrated energy storage system with the generating station :** (1) A generating company required to incur additional capital expenditure in the existing generating station for an integrated energy storage system shall share its proposal with the beneficiaries and file a petition for approval before undertaking such additional capitalization.

(2) The proposal under clause (1) above shall contain details of the proposed technology, scope of the work, phasing of expenditure, schedule of completion, estimated completion cost including interest during construction, foreign exchange component, if any, detailed computation of indicative impact on tariff to the beneficiaries, cost-benefit analysis and any other information considered to be relevant by the generating company.



(3) Where the generating company makes an application for approval of additional capital expenditure for installation of integrated energy storage system, the Commission may grant in-principle approval after due consideration of the reasonableness of the cost estimates, financing plan, schedule of completion, interest during construction, use of efficient technology, cost-benefit analysis, and such other factors as may be considered relevant by the Commission.

(4) After completion of the implementation of the integrated energy storage system, the generating company shall file a petition for the determination of a supplementary tariff for the integrated energy storage system. Any expenditure incurred or projected to be incurred and admitted by the Commission after a prudence check based on the reasonableness of the cost shall form the basis of the determination of the tariff.

(5) Un-discharged liability, if any, on account of the integrated energy storage system shall be allowed as additional capital expenditure during the year it is discharged, subject to prudence check.”

**“29B. Additional Capitalization on account of integrated energy storage system with the transmission system :** (1) A transmission licensee required to incur additional capital expenditure in the existing transmission system for an integrated energy storage system shall share its proposal with the concerned Regional Power Committee, Central Transmission Utility, and the concerned Regional Load Despatch Centre.

(2) Where the integrated energy storage system is to be installed with the existing transmission system, the concerned transmission licensee shall also forward a copy of the proposal to all long-term transmission customers or the Designated ISTS Customer of the region, as may be applicable, and file a petition for approval before undertaking such additional capitalization.

(3) The Central Transmission Utility and the concerned Regional Load Despatch Centre shall submit the recommendations to the concerned transmission licensee.

(4) The proposal under clauses (1) and (2) above shall contain details of the proposed technology, scope of the work, phasing of expenditure, schedule of completion, estimated completion cost including interest during construction, foreign exchange component, purpose of investment whether for increasing grid reliability or transmission deferral, if any, detailed computation of indicative impact on tariff to the beneficiaries, cost-benefit analysis and any other information considered to be relevant by the transmission licensee, as the case may be.

(5) Where the transmission licensee makes an application for approval of additional capital expenditure for the installation of an integrated energy storage system, the Commission may approve by considering the following purposes:

- a) The integrated energy storage system for exclusive use of strengthening reliability of the grid operation or deferring investment of the transmission system or efficient operation of the power system, where the cost will be recovered through CERC (Sharing of transmission charges) Regulations, 2020;

Provided that where the integrated energy storage system is to be installed to provide storage services as other businesses, the same will be governed through the Central Electricity Regulatory Commission (Sharing of Revenue Derived from Utilization of Transmission Assets for Other Business) Regulations, 2020;

- b) The integrated energy storage system may be partly used for reliability of the grid

operation or deferring investment as per clause (a) above or any other purpose as may be approved by the Commission.

(6) After completion of the implementation of the integrated energy storage system, the transmission licensee shall file a petition for the determination of a supplementary tariff for the integrated energy storage system. Any expenditure incurred or projected to be incurred and admitted by the Commission after a prudence check based on the reasonableness of the cost shall form the basis of the determination of the tariff.

(7) Un-discharged liability, if any, on account of the integrated energy storage system shall be allowed as additional capital expenditure during the year it is discharged, subject to prudence check.”

## **21. Amendment to Regulation 30 of the Principal Regulations:**

21.1. In para (iii) of the second proviso to clause (3) of Regulation 30 of the Principal Regulations, a new clause (c) shall be inserted, namely:—

“c) measurement of ramp rate, for the purpose of this Regulation, is to be decided by the National Load Dispatch Centre by issuing suitable guidelines for measurement by considering the energy measurement at a suitable interval.”

21.2. After clause (3) of Regulation 30 of the Principal Regulations, a new clause (4) shall be inserted, namely:—

“(4) Return on equity for an integrated energy storage system installed as additional capitalization with the existing generating station or the transmission system, as the case may be, shall be computed at the base rate of 14.00%.”

## **22. Amendment of Regulation 32 of the Principal Regulations:** The following fifth proviso shall be inserted in clause (5) of Regulation 32 of the Principal Regulations, namely:

“Provided also that if the generating company or the transmission licensee, as the case may be, has availed a part or entire loan from a related party at a higher rate of interest than the rate of interest charged by other financial or lending institutions not classified as related party, the rate of interest shall be —

- a) the weighted average rate of interest calculated based on the existing loan portfolio, excluding part of the loan availed from a related party;
- b) lower of actual or 1-year SBI MCLR plus 180 basis points, where the entire loan is availed from a related party; and
- c) reduced by restructuring or re-financing the loan within a period of one year from the date of commercial operation for the new project or from the date of notification of this regulation for the existing project.

*Clarification: The meaning of related party will be considered as per sub-section 76 of Section 2 of the Companies Act, 2013.”*

## **23. Amendment to Regulation 33 of the Principal Regulations:** In Regulation 33 of the Principal Regulations, a new clause (13) shall be inserted, namely:—



“(13) The depreciation of the integrated energy storage system installed with the generating station or the transmission system shall be recovered in the following manner:-

- a) If the integrated energy storage is implemented within the original scope of the generating station or the transmission system, the depreciation of the generating station or unit thereof or the transmission system, including the integrated energy storage system, shall be computed in accordance with Clauses (1) to (9) of this Regulation.
- b) If an existing generating station or transmission system in which the integrated energy storage system is installed is yet to complete its useful life, the depreciation shall be computed annually from the date of operation of the integrated energy storage system based on the straight-line method at rates specified in Appendix-I to these regulations;

Provided that the unrecovered depreciation as on 31<sup>st</sup> March of the year closing after a period of 12 years from the date of operation of such integrated energy storage system shall be spread over the higher of the balance operational life of the integrated energy storage system or the generating station, or the transmission system, as the case may be.”

**24. Amendment to Regulation 34 of the Principal Regulations:** In clause (1) of Regulation 34 of the Principal Regulations, a new clause (e) shall be inserted, namely:—

“(e) For an integrated energy storage system of coal or lignite-based thermal generating stations or the transmission system:-

- (i) Receivables equivalent to 45 days of the supplementary tariff of an integrated energy storage system;
- (ii) Maintenance spares @ 20% of operation and maintenance expenses and
- (iii) Operation and maintenance expenses for one month.”

**25. Amendment to Regulation 36 of the Principal Regulations:** In Regulation 36 of the Principal Regulations:—

- i) In sub-clause (6) of the clause (1), the following third proviso shall be inserted after the second proviso, namely:—

“Provided further that the Ash Transportation Expenses incurred by the thermal generating stations toward supply of ash for the construction of road and flyover embankments, shoreline protection structures in coastal districts, dams, or filling of the mine void shall be allowed to be recovered from the beneficiaries on a monthly basis after adjustment of revenue generated, subject to the following conditions:-

- a) submission of the Auditor Certificate towards monthly expenditure towards fly ash transportation expenses, and a certificate of delivery from the users of fly ash;
- b) award of fly ash transportation contract through transparent competitive bidding;
- c) the monthly fly ash transportation expenses allowed shall be subject to true-up at the end of the tariff period; and
- d) surplus revenue after adjustment of ash transportation expenses shall be treated as Non-tariff income.”

- iii) In sub-clause (a) of clause (2), after the words “shall be fixed at” and before the words “of the original project cost”, the words and expressions “3.5% and 5.0%” shall be substituted by “3.0% and 4.5%”.
- iv) In sub-clause (a) of clause (3), after the fourth proviso, a new fifth proviso shall be inserted, namely:—

“Provided also that the O&M expenses of the transmission system of Bhakra Beas Management Board shall be allowed based on past year data on a case-by-case basis at the time of the determination of tariff.”

- v) After clause (3), the following new clause (4) shall be inserted, namely:—

**“(4) Integrated Energy storage system:** The operation and maintenance expenses on account of integrated energy storage systems in coal or lignite-based thermal generating stations or the transmission system, as the case may be, shall be 2% of the admitted capital expenditure (excluding IDC and IEDC) as on the date of commercial operation, which shall be escalated annually @ 5.25% during the first two years of operation;

Provided that the generating company or the transmission licensee, as the case may be, shall file the details of the operation and maintenance expenses for each financial year for consideration of the Commission and wherever required, the Commission may revise the operation & maintenance expenses through separate order either by its own motion or application filed by the generating company or the transmission licensee, as the case may be.”

**26. Amendment to Regulation 37 of the Principal Regulations:** In Regulation 37 of the Principal Regulations, proviso to clause (3) shall be substituted by the following, namely:—

“Provided that the generating company may request an interim input price in its petition, which may be allowed by the Commission up to 90% of the claimed input price after the first hearing of the application;

Provided further that the difference between the input price of coal determined under these regulations and the input price of coal either adopted by the generating company in terms of this sub-regulation or the interim input price allowed by the Commission under the first proviso to this sub-regulation shall be recoverable or payable in accordance with sub-regulation (4) of this Regulation.”

**27. Amendment to Regulation 39 of the Principal Regulations:** In Regulation 39 of the Principal Regulations:—

- i) In clause (1), the words “Coal Mines (Special Provisions) Act, 2015”, shall be substituted by the words and expressions “Coal Mines (Special Provisions) Act, 2015, Mines and Minerals (Development and Regulation) Act, 1957 or any other applicable Act”.
- ii) In clause (2), the words “Coal Mines (Special Provisions) Act, 2015”, shall be substituted by the words and expressions “Coal Mines (Special Provisions) Act, 2015, Mines and Minerals (Development and Regulation) Act, 1957 or any other applicable Act”.
- iii) New clause (4A) shall be inserted, namely:—

“(4A) No incentive shall be payable to the generating company for the production of

coal exceeding ATQ, up to 100% of the quantity specified in the Mining Plan:

Provided that if the actual production of coal or lignite, as the case may be, from the integrated mine exceeds 100% of the quantity specified in the Mining Plan, the generating company shall retain fifty percent of the savings on achieving higher efficiency worked out by the following formulae:-

$$\text{Sharing of gains} = 1/2 \times \text{Savings} \times \text{Additional deliveries}$$

$$\text{Savings} = [ \text{ROM Cost (Annual quantity of coal or lignite as specified in the mining plan)} - \text{ROM Cost (Actual production)} ]$$

Where,

- i) ROM Cost (Actual production) is the ROM cost in Rs per Tonne of coal or lignite worked out as per the sub-regulation (2) and (3) of this Regulation by considering the actual quantity of coal or lignite specified in the mining plan and the actual annual extraction cost;
- ii) ROM Cost (100% quantity of coal lignite specified in the mining plan) is the ROM cost in Rs per Tonne of coal or lignite worked out as per the sub-regulation (2) and (3) of this Regulation by considering 100% quantity of coal or lignite specified in the mining plan and actual extraction cost;
- iii) Additional deliveries are the quantity of coal delivered to the associated generating station beyond 100% quantity of coal or lignite specified in the mining plan.”
- iv) In clause (5), after the words “terms of Rupees per tonne” at the end of sentence, the words and expressions “on a monthly basis based on ATQ which shall be reconciled at the end of the year based on actual production from the integrated mine, and the differential amount shall be adjusted in the six-monthly instalments” shall be inserted.

**28. Amendment to Regulation 41 of the Principal Regulations:** In clause (3) of Regulation 41 of the Principal Regulations, after the second proviso, the following third proviso shall be inserted, namely:—

“Provided also that the expenditure incurred for development of an integrated mine, with the approval of the Board of the generating company before the issue of the Investment Approval, shall also form part of the capital cost, and IDC and IEDC shall be considered in the manner as specified under Regulation 21 of these Regulations.”

**29. Amendment to Regulation 42 of the Principal Regulations:** In Regulation 42 of the Principal Regulations:—

- i) in clause (1), after the words “as per the Mining Plan”, the words “or as per the investment approval by the Board;” shall be inserted.
- ii) in sub-clause (a) of clause (1), after the words “as per the Mining Plan”, the words “or as per the investment approval by the Board;” shall be inserted.
- iii) in sub-clause (a) of clause (2), after the words “as per the Mining Plan”, the words “or as per the investment approval by the Board” shall be inserted.

**30. Amendment to Regulation 45 of the Principal Regulations:** In Regulation 45 of the Principal Regulations:—

- i)* in proviso (ii) of clause (2), the word “and” between the “freehold land is conditional” and “is required to be returned” shall be substituted by the words “or”.
- ii)* in proviso (ii) of clause (2), after the words “prudence check by the Commission” and before the words “; and”, the words “and the net realisable value of the said land after the operational life of the mine or in case of alternate use, the deemed cost of the land, if any, shall be fully shared with the beneficiaries” shall be inserted.

**31. Amendment to Regulation 50 of the Principal Regulations:** In Regulation 50 of the Principal Regulations:—

- i)* in clause (2), after the words “the commensurate grade of coal”, the words “or price of alternative coal, as the case may be” shall be inserted.
- ii)* a new clause (3) shall be inserted, namely:—

“(3) In case of an integrated mine of lignite, the actual production is reduced below ATQ attributed to the low scheduled generation from beneficiaries (including scheduling to another beneficiary or open market), the generating company shall recover the fixed components of annual extraction cost of unutilized lignite, after duly subtracting the lignite sold in the open market, on a case-by-case basis;

**32. Amendment to Regulation 51 of the Principal Regulations:** In Regulation 51 of the Principal Regulations: —

- i)* in sub-clause (a) of clause (3), the words “If Mine Developer and Operator is appointed” shall be substituted by the words “If OB adjustment is not factored in the mining charge of the Mine Developer and Operator contract”
- ii)* in para (iii) in sub-clause (b) of clause (3), the words “without” in the words and expressions “without the OB adjustment as per contract” shall be substituted by the words “with”.
- iii)* para (vi) in sub-clause (b) of clause (3) shall be deleted.”

**33. Amendment to Regulation 52 of the Principal Regulations:** In Regulation 52 of the Principal Regulations:—

- a)* in sub-clause (b) of clause (2), the formula of GCV adjustment shall be substituted by the following, namely:—

“If GCV adjustment is not factored into the mining charge of the Mine Developer and Operator contract:

$$\text{GCV Adjustment} = [(\text{Mining Charge})] \times [(\text{Declared GCV of coal} - \text{Weighted Average GCV of coal extracted in the year}) / (\text{Declared GCV of coal})]$$

If the Mine Developer and Operator is not appointed:

$$\text{GCV Adjustment} = [(\text{Operation \& Maintenance expenses of the mining activity} / \text{ATQ})] \times [(\text{Declared GCV of coal} - \text{Weighted Average GCV of coal extracted in the year}) / (\text{Declared GCV of coal})]$$

**34. Amendment to Regulation 53 of the Principal Regulations:** In Regulation 53 of the Principal Regulations, in clause (1) the words “Coal Mines (Special Provisions) Act, 2015”, shall be substituted by the words and expressions “Coal Mines (Special Provisions) Act, 2015, Mines and Minerals (Development and Regulation) Act, 1957 or any other applicable Act”.

**35. Amendment to Regulation 57 of the Principal Regulations:** In Regulation 57 of the Principal Regulations, the existing clause shall be numbered (1) and thereafter, a new clause (2) shall be inserted: —

“(2) The Supplementary Energy Charges on account of the integrated energy storage system shall comprise the energy charges of the electricity sourced from the same generating station as approved by the Commission, or the cost of the electricity sourced from other generating stations as determined or adopted by the Commission, or the cost of electricity procured at the competitive rate from the open market.”

**36. Amendment to Regulation 61 of the Principal Regulations:** After Regulation 61 of the Principal Regulations, the following Regulation 61A shall be inserted, namely:—

**“(61A) Aggregate cost of Electricity used for charging integrated energy storage system:** The cost of electricity for an integrated energy storage system for supplementary energy charges shall be the:

- a) Energy charges of the generating station if such energy is sourced from the surplus generation of the same generating station;
- b) Energy charges of such other generating station from where the energy is sourced for charging the integrated energy storage system from the share of the same beneficiaries of the generating station where the integrated energy storage system is installed; and
- c) Aggregate cost of electricity (fixed charges, energy charges and any other) used for charging of the integrated energy storage system of the generating station if such energy is sourced from another generating station or the market price of electricity procured from the open market.”

**37. Amendment to Regulation 63 of the Principal Regulations:** In Regulation 63 of the Principal Regulations, the heading shall be substituted by the following, namely:—

**“63. Computation and Payment of Supplementary Capacity Charge on account of emission control system for Coal or Lignite-based Thermal Generating Stations:”**

**38. Amendment to Regulation 64 of the Principal Regulations:** In Regulation 64 of the Principal Regulations, the heading shall be substituted by the following, namely:—

**“61. Computation and Payment of Energy Charge for Thermal Generating Stations and Supplementary Energy Charge on account of emission control system for Coal or Lignite-based Thermal Generating Stations:”**

**39. Insertion of New Regulation 64A of the Principal Regulations:** After Regulation 64 of the Principal Regulations, the following new Regulation 64A shall be inserted, namely:—

**“64A. Computation and Payment of Supplementary Capacity Charge on account of integrated energy storage system for Coal or Lignite-based Thermal Generating Stations:**

(1) The fixed cost of the integrated energy storage system installed in coal or lignite-based thermal generating stations shall be computed on an annual basis based on the norms specified under these Regulations and recovered every month under a fixed storage charge. The total fixed storage charge for an integrated energy storage system shall be shared by its beneficiaries as per their respective percentage share or allocation in the capacity of the generating station where the integrated energy storage system is installed.

(2) The fixed storage charge of the integrated energy storage system payable to a coal or lignite generating station for a calendar month shall be calculated in accordance with the following formulae:

$$SCC_{ess}(n) = (AFC_{ess}) \times (n/12) \times (PAF_{ess} M(n)/NAPAF_{ess}) \text{ subject to ceiling of } (12) \\ \{(AFC_{ess}) \times (n/12)\} - \sum_{n=1} SCC(n-1)$$

Where,

$SCC_{ess}(n)$  = Supplementary Capacity Charges of the integrated energy storage system for the  $n^{th}$  Month.

$AFC_{ess}$  = Annual Fixed Cost of the ESS.

$PAF_{ess}M(n)$  = Plant Availability Factor achieved up to the end of the  $n^{th}$  Month.

$NAPAF_{ess}$  = Normative Annual Plant Availability Factor of the integrated energy storage system.

(3) Normative Plant Availability Factor for a month for the purpose of Fixed Storage Charge of the integrated energy storage system shall be as specified in clause (e) of Regulation 70A of these regulations. The  $PAF_{ess}M(n)$  shall be worked out in accordance with Clause (59) of Regulation 3 of these Regulations.”

**40. Insertion of New Regulation 64B of the Principal Regulations:** After Regulation 64 of the Principal Regulations and Regulation 64A as given above, a new Regulation 64B shall be inserted:—

**“64B. Computation and payment of supplementary energy charge on account of integrated energy storage system for coal or lignite-based thermal generating stations:**

(1) The energy charge of the integrated energy storage system shall cover the cost of energy required for charging the integrated energy storage system during charging operation.



- (2) The energy used for charging the integrated energy storage system shall be arranged from the surplus generation from the associated generating station where the integrated energy storage system is installed or the other generating station or from the open market:

Provided that—

- a) use of integrated energy storage systems by the generating company to maintain the technical minimum of the generating unit and to ensure the continuous supply to the beneficiaries shall have priority;
  - b) where the surplus energy from the associated generating station is not available for charging the integrated energy storage system, energy from the most economical alternate source may be arranged by the beneficiary or the generating company on behalf of the beneficiaries.
- (3) The supplementary Energy charge payable to the generating company for a month shall be:

Supplementary Energy Charges (SEC(n)) = (Supplementary Energy charge rate of integrated energy storage system (SECRess) in Rs/ kWh) x {Scheduled energy from integrated energy storage system (ex-bus) for the n<sup>th</sup> month in kWh}

- (4) The supplementary energy charge rate on account of the integrated energy storage system shall be worked out based on the source from where the electricity is procured for charging the integrated energy storage system in the following manner:

- a) Charging from an associated generating station whose tariff is determined by the Commission:

$$(\text{SECRess in Rs/kWh}) = (\text{ECR in Rs/kWh}) / [\text{Maximum (Normative Round-trip efficiency (RTEess), Actual Round trip efficiency) } \times (1 - \text{AECess})]$$

- b) Allocated share of beneficiaries from another generating station whose tariff is determined by the Commission:

$$(\text{SECRess in Rs/kWh}) = (\text{ECR in Rs/kWh}) / [\text{Maximum (Normative Round-trip efficiency (RTEess), Actual Round trip efficiency) } \times (1 - \text{AECess})]$$

- c) Charging from another generating station whose tariff is approved by the Commission:

$$(\text{SECRess in Rs/kWh}) = [(\text{ECR}) + (\text{CC})] \text{ in Rs/kWh} / [\text{Maximum (Normative Round-trip efficiency (RTEess), Actual Round trip efficiency) } \times (1 - \text{AECess})]$$

- d) Charging from procuring electricity from the open market or any other source:

$$(\text{SECRess in Rs/kWh}) = (\text{Discovered Tariff in Rs/kWh}) / [(\text{Maximum (Normative Round-trip efficiency (RTEess), Actual Round trip efficiency )} \times (1 - \text{AECess}))]$$

- e) Charging from electricity drawal from the grid during high frequency operation:

$$(\text{SECRess in Rs/kWh}) = (\text{DSM Rate in Rs/kWh}) / [(\text{Maximum (Normative Round-trip efficiency (RTEess), Actual Round trip efficiency )} \times (1 - \text{AECess}))].$$

(5) In addition to the supplementary capacity charges and supplementary energy charges, an incentive shall be payable to a generating station or unit thereof @ 25 paise/kWh for excess discharge of energy over and above the energy corresponding to normative round-trip efficiency achieved on a cumulative basis, as specified in Regulation 70 of these regulations.

(6) In case energy for charging is arranged by the beneficiaries at their cost, the Energy Charge Rate shall be zero.”

**41. Amendment of Regulations 65 of the Principal Regulations:** In clause (7) of Regulation 65 of the Principal Regulations, the words and expressions “truing up at the end of the tariff period” shall be substituted by the words “trued up on the application filed by the generating company at the end of the tariff period”.

**42. Amendment to Regulation 70 of the Principal Regulations:** In Regulation 70 of the Principal Regulations, the following new clause (FF) shall be inserted, namely:—

**“(FF) Norms of operation for integrated energy storage system :** (1) Norms for the operation of an integrated energy storage system shall be as under:-

- a) Normative Availability Factor of integrated energy storage system (NAPAFess) shall be 90% for an integrated energy storage system installed at the generating station;
- b) Round-trip efficiency of the integrated energy storage system (RTEess) shall be 85% for an integrated energy storage system installed at the generating station or the transmission system;
- c) Auxiliary Energy Consumption of integrated energy storage system (AECess) shall be 5% of the input energy supply to an integrated energy storage system installed at the generating station or the transmission system, as the case may be.”

**43. Amendment of Regulations 74 of the Principal Regulations:** In Regulation 74 of the Principal Regulations:—

- i) The existing clause shall be numbered (1) and after the words “for the generating station”, the words and expressions, “including an integrated energy storage system” shall be inserted.

ii) In clause (1), the following proviso shall be inserted, namely:—

“Provided that the first right of discharge, from the integrated energy storage system, shall lie with the beneficiary, except when it is required for the safe and secure operation of the power system.”

iii) The following new clause (2) shall be inserted, namely:—

“(2) The procedure for charging, scheduling, and dispatch of electricity and energy account for the integrated energy storage system with the transmission system or the generating station shall be prepared by the respective Regional Power Committee in consultation with the Regional Load Dispatch Centre consistent with the Grid Code.”

**44. Amendment of Regulations 78 of the Principal Regulations:** In Regulation 78 of the Principal Regulations, after clause (2), the following new clauses (3) and (4) shall be added, namely:—

“(3) The charges determined under these regulations in relation to the integrated energy storage system forming part of the transmission system shall be shared by the beneficiaries or long-term customers or the designated ISTS customers, as the case may be, in accordance with the Sharing Regulations:

Provided that receipts received from providing storage services by the transmission licensee to the generating company or licensee shall be adjusted to reduce the yearly transmission charges of the transmission system.

(4) The transmission licensee shall retain the revenue of 25 paise/kWh for excess discharge of energy over and above the energy corresponding to normative round-trip efficiency achieved on an annual basis, as specified in Regulation 70 of these regulations.”

**46. Insertion of New Regulation 84A of the Principal Regulations:** After Regulation 84 of the Principal Regulations, the following new Regulation 84A shall be inserted, namely:—

**“84A. Sharing of gains on account of storage services:** (1) If the generating company or the transmission licensee, as the case may be, renders storage service to the other generating company, beneficiaries, or the system operator in the form of ancillary services or sale in the open market, there may be a gain on account of the following:

- a) the receipt of the additional charges towards the supplementary fixed charges of the integrated energy storage system;
- b) the receipt of the higher energy charges in comparison with the supplementary energy charges; or
- c) both (a) and (b) above.

(2) The receipt, excluding incentive, if any, under clause (1) above –

- a) shall be appropriated by the generating company against the supplementary storage charges and supplementary energy charges first, and net gain, after adjusting the fixed cost, shall be shared with the beneficiaries and the generating company in the ratio of 1:1;

- b) shall be adjusted by the transmission licensee in the yearly transmission charges of the transmission system.”

**47. Insertion of New Regulation 101A of the Principal Regulations:** After Regulation 101 of the Principal Regulations, the following new Regulation 101A shall be inserted, namely: —

**“101A. Special Provisions relating to Regulatory Sandbox:** To scale up research, development, and innovation (RDI) in power sector relevant for energy security and self-reliance, the generating company or the transmission licensee, or the company whose tariff or input price determined under these Regulations shall be eligible to participate in the Regulatory Sandbox for undertaking innovation and research projects in the power sector, with prior approval of the Commission, and the additional cost on this count shall be allowed up to 0.5% of annual fixed cost or ₹100 Cr, whichever is less.”

**48. Amendment to the Appendix IV of the Principal Regulations:** In Appendix-IV of the Principal Regulations:—

- i) in clause (2), the following sub-clauses (via) and (viii) shall be inserted, namely:—

**“via) Integrated Energy Storage System (“ESS”):** Each integrated ESS with the transmission system or sub-station shall be considered as a separate element.”

**viii) Thyristor Controlled Series Reactors (TCSCs) or Fixed Series Reactors:** Each Thyristor Controlled Series Reactor (TCSCs) or Fixed Series Reactors shall be considered as one element.

- ii) In clause (3), the following shall be inserted:

- a) “+(z X AVz) +(e X AVe)” and “z+e” shall be added in the numerator and denominator respectively

- b) The following terms shall be added before the formula of TAFMn (in %) for HVDC System,

Z = Total number of TCSs or FSCs

AVz = Availability of z number of TCSs or FSCs

E = Total number of ESSs

Ave = Availability of number of ESS”

- c) In clause (4), the following sub-clauses shall be added:

“(h) For TCSCs/FSCs- The total rated MVAR capacity;

(i) For integrated energy storage system- the total rated MVARh capacity”

**49. Amendment to Appendix-V of the Principal Regulations:** In Appendix-V of the Principal Regulations:—

- i) the following formulae shall be inserted, namely:—

$$AV_z \text{ (Availability of } z \text{ no. of TCSCs/FSCs)} = \frac{\sum_{a=1}^z W_a(T_a - TNA_a)/T_a}{\sum_{a=1}^z W_a}$$

$$AV_e \text{ (Availability of } e \text{ no. of ESS)} = \frac{\sum_{e=1}^e W_e(T_e - TNA_e)/T_e}{\sum_{e=1}^e W_e}$$

ii) the following new terms shall be inserted, namely:—

$W_a$  = Weightage factor for  $a^{\text{th}}$  TSC or FSC  
 $W_e$  = Weightage factor for  $e^{\text{th}}$  ESS

**50. Amendment to Tariff Filing Forms in Annexure-1 to the Principal Regulations In Annexure- I of the Principal Regulations —**

- i) In Part I, Tariff filing forms for the determination of supplementary tariff for Thermal Generating station, the amendments as identified in Appendix-A shall be incorporated in the tariff filing forms for the determination of supplementary tariff.
- ii) In Part III, Tariff filing forms for the determination of supplementary tariff for the Transmission system, the amendments as identified in Appendix-B shall be incorporated

**Secretary**

*Note:* (1) The Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2024 were published vide notification No. L-1/268/2022/CERC dated 15<sup>th</sup> March 2024 and in the Gazette of India, Extraordinary, Part III-Section 4. No. 468 dated 1st July 2024.

(2) The Central Electricity Regulatory Commission (Terms and Conditions of Tariff) (First Amendment) Regulations, 2024 were published vide notification No. L-1/268/2022/CERC dated 4<sup>th</sup> February 2025 and in the Gazette of India, Extraordinary, Part III-Section 4. No. 293 dated 11<sup>th</sup> April, 2025.

## Appendix-A

**List of the amendments in the Tariff Filing Forms (Thermal) for the determination of the Tariff, Main Tariff Form, Annexure- I, Part I of the Principal Regulations**

1. The following rows shall be added in the Form-1 of Annexure-I(Part I) of the Principal Regulations

| S. No.     | Particulars                                                  | Unit    | Existing<br>2023-24 | 2024-25 | 2025-26 | 2026-27 | 2027-28 | 2028-29 |
|------------|--------------------------------------------------------------|---------|---------------------|---------|---------|---------|---------|---------|
|            | 2                                                            | 3       | 4                   | 5       | 6       | 7       | 8       | 9       |
| <b>4.</b>  | <b>Summary of Supplementary Tariff (ESS)</b>                 |         |                     |         |         |         |         |         |
| <b>4.1</b> | Depreciation                                                 | Rs Lakh |                     |         |         |         |         |         |
| <b>4.2</b> | Interest on Loan                                             | Rs Lakh |                     |         |         |         |         |         |
| <b>4.3</b> | Return on Equity <sup>1</sup>                                | Rs Lakh |                     |         |         |         |         |         |
| <b>4.4</b> | Interest on Working Capital                                  | Rs Lakh |                     |         |         |         |         |         |
| <b>4.5</b> | O&M Expenses                                                 | Rs Lakh |                     |         |         |         |         |         |
|            | <b>Total</b>                                                 | Rs Lakh |                     |         |         |         |         |         |
| <b>4.6</b> | Supplementary Capacity Charges (ESS)                         | Rs/Unit |                     |         |         |         |         |         |
| <b>5</b>   | <b>Supplementary Energy Charges &amp; Source of Charging</b> |         |                     |         |         |         |         |         |
| <b>5.1</b> | Same Generating Station (Name)                               | Rs/Unit |                     |         |         |         |         |         |
| <b>5.2</b> | Another Generating Station 1 (Name)                          | Rs/Unit |                     |         |         |         |         |         |
| <b>5.3</b> | Another Generating Station 2 (Name)                          | Rs/Unit |                     |         |         |         |         |         |
| <b>5.4</b> | Renewable Generation 1 (Name)                                | Rs/Unit |                     |         |         |         |         |         |
| <b>5.5</b> | Renewable Generation 2 (Name)                                | Rs/Unit |                     |         |         |         |         |         |
| <b>5.6</b> | Open Market (Name of Platform/Traders)                       | Rs/Unit |                     |         |         |         |         |         |



| S. No. | Particulars | Unit | Existing<br>2023-24 | 2024-25 | 2025-26 | 2026-27 | 2027-28 | 2028-29 |
|--------|-------------|------|---------------------|---------|---------|---------|---------|---------|
|        | 2           | 3    | 4                   | 5       | 6       | 7       | 8       | 9       |
|        | Total       |      |                     |         |         |         |         |         |

2. In the Form-1(I), the title of the form “**Statement showing claimed capital cost – (A+B)**” shall be substituted by the words and expressions “**Statement showing claimed capital cost of generating station, emission control system or the integrated energy storage system, as the case may be– (A+B)**”
3. In the Form-1(IIA), the title of the form “**Statement showing Return on Equity at Normal Rate**” shall be substituted by the words and expressions “**Statement showing Return on Equity at Normal Rate of generating station, emission control system or the integrated energy storage system, as the case may be– (A+B)**”
4. In the Form-1(IIB), the title of the form “**Statement showing Return on Equity linked to SBI MCLR**” shall be substituted by the words and expressions “**Statement showing Return on Equity linked to SBI MCLR\_of generating station, emission control system or the integrated energy storage system, as the case may be– (A+B)**”
5. In the Form-2, following rows shall be added after the row “ Details of SPM control system” in the table:

| Particulars                                            | Unit-I | Unit-II | Unit-III | .... |  |  |
|--------------------------------------------------------|--------|---------|----------|------|--|--|
| Types of ESS (integrated )                             |        |         |          |      |  |  |
| Technology of ESS (Li-ion, odium-Sulfur, or Lead-acid) |        |         |          |      |  |  |
| Number of Battery Racks/Modules of ESS                 |        |         |          |      |  |  |

| Particulars                                                                           | Unit-I | Unit-II | Unit-III | .... |  |  |
|---------------------------------------------------------------------------------------|--------|---------|----------|------|--|--|
| Number of Battery Cell in ESS                                                         |        |         |          |      |  |  |
| Voltage capacity of Battery Cell (DC volt)                                            |        |         |          |      |  |  |
| Operation mode (bid-directional or uni-directional at interface point with the grid ) |        |         |          |      |  |  |
| Rated Capacity (MW) of ESS                                                            |        |         |          |      |  |  |
| Maximum continuous rating of ESS (MW)                                                 |        |         |          |      |  |  |
| Energy Capacity (MWh) of ESS                                                          |        |         |          |      |  |  |
| Voltage output of ESS                                                                 |        |         |          |      |  |  |
| AC                                                                                    |        |         |          |      |  |  |
| DC                                                                                    |        |         |          |      |  |  |
| Power Factor of ESS                                                                   |        |         |          |      |  |  |
| Round-Trip Efficiency of ESS                                                          |        |         |          |      |  |  |
| Response Time of ESS                                                                  |        |         |          |      |  |  |
| State of Charge (SoC)                                                                 |        |         |          |      |  |  |
| Cycle Life of ESS                                                                     |        |         |          |      |  |  |
| C-Rate of ESS                                                                         |        |         |          |      |  |  |
| i) Charging                                                                           |        |         |          |      |  |  |
| ii) Discharging                                                                       |        |         |          |      |  |  |
| Black Start Capability of ESS                                                         |        |         |          |      |  |  |
| Efficiency or Utilization factor (%) of ESS                                           |        |         |          |      |  |  |

6. In the Form-3, —

- a) the title of the form “**Normative parameters considered for tariff computations**” shall be substituted by the words and expressions “**Normative parameters considered for computations of tariff, supplementary tariff of ECS or supplementary tariff of ESS, as the case may be.**”

b) following rows shall be added after the row “ Transit and Handling Losses of coal or lignite, as applicable” in the table:

| Particulars                         | Unit  | Existing 2023-24 | 2024-25 | 2025-26 | 2026-27 | 2027-28 | 2028-29 |
|-------------------------------------|-------|------------------|---------|---------|---------|---------|---------|
| 1                                   | 2     | 3                | 4       | 5       | 6       | 7       | 8       |
| Round-Trip Efficiency               | %     |                  |         |         |         |         |         |
| Number of Cycles per day            | %     |                  |         |         |         |         |         |
| Total annual cycles                 |       |                  |         |         |         |         |         |
| Availability of ESS (NAPAF)         | %     |                  |         |         |         |         |         |
| Auxiliary Energy Consumption of ESS | %     |                  |         |         |         |         |         |
| Depth of Discharge (DoD)            |       |                  |         |         |         |         |         |
| Useful life of ESS                  | Years |                  |         |         |         |         |         |
|                                     |       |                  |         |         |         |         |         |

7. In the Form-A, —

a) the words “including emission control system or integrated energy storage system, as the case may be, “ shall be added at the end of title of the form “**Abstract of Capital Cost Estimates and Schedule of Commissioning for the New Projects**”

8. In the Form-B, —

a) the words “including emission control system or integrated energy storage system, as the case may be, “ shall be added at the end of title;

b) following rows shall be added after the row “ **2.5 Control & Instrumentation (C & I) Package**” in the table:

| S. No. | Break Down                      | As per Original Estimates as per Investment Approval | Actual Capital Expenditure as on COD <sup>6</sup> | Liabilities/ Provisions | Variation (3 – 4 - 5) | Specific Reasons for Variation | Estimated Capital expenditure upto Cut-off dat |
|--------|---------------------------------|------------------------------------------------------|---------------------------------------------------|-------------------------|-----------------------|--------------------------------|------------------------------------------------|
|        |                                 |                                                      | Actual Amount                                     |                         |                       |                                |                                                |
| 1      | 2                               | 3                                                    | 4                                                 | 5                       | 6                     | 7                              | 8                                              |
|        |                                 |                                                      |                                                   |                         |                       |                                |                                                |
| 2.5A   | Specific Equipment of ESS       |                                                      |                                                   |                         |                       |                                |                                                |
| 2.5A.1 | Battery Pack Cost               |                                                      |                                                   |                         |                       |                                |                                                |
| 2.5A.2 | Power Conversion System (PCS)   |                                                      |                                                   |                         |                       |                                |                                                |
| 2.5A.3 | AC-DC/DC-DC Coupling cost       |                                                      |                                                   |                         |                       |                                |                                                |
| 2.5A.4 | Battery Management System (BMS) |                                                      |                                                   |                         |                       |                                |                                                |
| 2.5A.5 | Specific fire protection system |                                                      |                                                   |                         |                       |                                |                                                |

9. In the Form-E, —

- a) the words “including integrated energy storage system, as the case may be, “ shall be added at the end of title;
- b) following rows shall be added after the row “ Type of Coal (Domestic/Imported)” in the table:

| S. No. | Variables                           | (Design Operating Range) Values |
|--------|-------------------------------------|---------------------------------|
| 25     | Battery/Module Supply               |                                 |
| 26     | Power Conversion System (PCS)       |                                 |
| 27     | Energy Management & Control for ESS |                                 |
|        |                                     |                                 |

## Appendix-B

**List of the amendments in the Tariff Filing Forms (Transmission) for the determination of the Tariff, Main Tariff Form, Annexure- I, Part III of the Principal Regulations**

1. The following rows shall be added in the Form-1 of Annexure-I(Part IIII) of the Principal Regulations

| S. No.     | Particulars                                                  | Form No.   | 2024-25 | 2025-26 | 2026-27 | 2027-28 | 2028-29 | 2028-29 |
|------------|--------------------------------------------------------------|------------|---------|---------|---------|---------|---------|---------|
|            | 2                                                            | 3          | 4       | 5       | 6       | 7       | 8       | 9       |
| <b>2.</b>  | <b>Summary of Supplementary Tariff (ESS)</b>                 |            |         |         |         |         |         |         |
| <b>2.1</b> | Depreciation                                                 | Rs Lakh    |         |         |         |         |         |         |
| <b>2.2</b> | Interest on Loan                                             | Rs Lakh    |         |         |         |         |         |         |
| <b>2.3</b> | Return on Equity <sup>1</sup>                                | Rs Lakh    |         |         |         |         |         |         |
| <b>2.4</b> | Interest on Working Capital                                  | Rs Lakh    |         |         |         |         |         |         |
| <b>2.5</b> | O&M Expenses                                                 | Rs Lakh    |         |         |         |         |         |         |
|            | <b>Total</b>                                                 | Rs Lakh    |         |         |         |         |         |         |
| <b>2.6</b> | Supplementary Capacity Charges (ESS)                         | Rs per kWh |         |         |         |         |         |         |
| <b>3</b>   | <b>Supplementary Energy Charges &amp; Source of Charging</b> |            |         |         |         |         |         |         |
| <b>3.1</b> | Drawal from Inter-state grid (Name)                          | Rs per kWh |         |         |         |         |         |         |
| <b>3.2</b> | Drawal from Intra-state grid (Name)                          | Rs per kWh |         |         |         |         |         |         |
| <b>3.3</b> | Drawal from Generating Station 1 (Name)                      | Rs per kWh |         |         |         |         |         |         |
| <b>3.4</b> | Open Market (Name of Platform/Traders)                       | Rs per kWh |         |         |         |         |         |         |
| <b>3.5</b> | ...                                                          | Rs per kWh |         |         |         |         |         |         |
| <b>3.6</b> | ...                                                          | Rs per kWh |         |         |         |         |         |         |

2. The following rows shall be added in the Form-2 of Annexure-I(Part IIII) of the Principal Regulations:

**“3A. Integrated Energy Storage System:**

| S. No. | Name of ESS | Type of ESS | Installed Capacity | No of Modules | No of Battery Cells | Date of Commercial operation | Capital Cost upto Cutoff date(Original Project cost) | Covered in the present Petition |                     |
|--------|-------------|-------------|--------------------|---------------|---------------------|------------------------------|------------------------------------------------------|---------------------------------|---------------------|
|        |             |             |                    |               |                     |                              |                                                      | Yes/No                          | If No, Petition No. |
| 1      |             |             |                    |               |                     |                              |                                                      |                                 |                     |
| 2      |             |             |                    |               |                     |                              |                                                      |                                 |                     |
| 3      |             |             |                    |               |                     |                              |                                                      |                                 |                     |
| -      |             |             |                    |               |                     |                              |                                                      |                                 |                     |

**Summary**

| O& M Expenses for the Energy Storage System covered in the instant petition | 2024-25 | 2025-26 | 2026-27 | 2027-28 | 2028-29 |
|-----------------------------------------------------------------------------|---------|---------|---------|---------|---------|
| Original Project Cost / Asset related to the ESS                            |         |         |         |         |         |
| O&M expenses as per regulations (2% of Original Project Cost)               |         |         |         |         |         |
| Actual O&M Expense (Rupees in Lakh)*                                        |         |         |         |         |         |

**Plant Characteristics**

| Particulars                                            | S/S I | S/S-II | S/S-III | .... |  |  |
|--------------------------------------------------------|-------|--------|---------|------|--|--|
| Types of ESS (integrated )                             |       |        |         |      |  |  |
| Technology of ESS (Li-ion, odium-Sulfur, or Lead-acid) |       |        |         |      |  |  |
| Number of Battery Racks/Modules                        |       |        |         |      |  |  |
| Number of Battery Cell                                 |       |        |         |      |  |  |

| Particulars                                                                           | S/S I | S/S-II | S/S-III | .... |  |  |
|---------------------------------------------------------------------------------------|-------|--------|---------|------|--|--|
| Voltage capacity of Battery Cell (DC volt)                                            |       |        |         |      |  |  |
| Operation mode (bid-directional or uni-directional at interface point with the grid ) |       |        |         |      |  |  |
| Rated Capacity (MW)                                                                   |       |        |         |      |  |  |
| Maximum continuous rating of ESS (MW)                                                 |       |        |         |      |  |  |
| Energy Capacity (MWh)                                                                 |       |        |         |      |  |  |
| Voltage output                                                                        |       |        |         |      |  |  |
| AC                                                                                    |       |        |         |      |  |  |
| DC                                                                                    |       |        |         |      |  |  |
| Power Factor                                                                          |       |        |         |      |  |  |
| Round-Trip Efficiency                                                                 |       |        |         |      |  |  |
| Response Time                                                                         |       |        |         |      |  |  |
| State of Charge (SoC)                                                                 |       |        |         |      |  |  |
| Cycle Life                                                                            |       |        |         |      |  |  |
| C-Rate                                                                                |       |        |         |      |  |  |
| i) Charging                                                                           |       |        |         |      |  |  |
| ii) Discharging                                                                       |       |        |         |      |  |  |
| Black Start Capability                                                                |       |        |         |      |  |  |
| Efficiency or Utilization factor (%)                                                  |       |        |         |      |  |  |

Note: 1. The O&M expenses as per regulation shall be worked on based on estimated project cost.

2. Expenses of ESS shall be allowed on actual basis after due prudence check.

\*The actual O&M expenses to be provided at the time of true up."

3. In clause (4) in the Form-2 of Annexure-I(Part IIII) of the Principal Regulations, the additional row "4. Integrated Energy Storage System" shall be added.

4. In the Form-3, following rows shall be added in the table:



| Particulars                         | Unit  | Existing 2023-24 | 2024-25 | 2025-26 | 2026-27 | 2027-28 | 2028-29 |
|-------------------------------------|-------|------------------|---------|---------|---------|---------|---------|
| 1                                   | 2     | 3                | 4       | 5       | 6       | 7       | 8       |
| <b>B. Integrated ESS</b>            |       |                  |         |         |         |         |         |
| Round-Trip Efficiency               | %     |                  |         |         |         |         |         |
| Number of Cycles per day            | %     |                  |         |         |         |         |         |
| Total annual cycles                 |       |                  |         |         |         |         |         |
| Availability of ESS (NAPAF)         | %     |                  |         |         |         |         |         |
| Auxiliary Energy Consumption of ESS | %     |                  |         |         |         |         |         |
| Depth of Discharge (DoD)            |       |                  |         |         |         |         |         |
| Useful life of ESS                  | Years |                  |         |         |         |         |         |
|                                     |       |                  |         |         |         |         |         |

5. In the Form-5, the following rows shall be added in the table:-

| S. No.<br>(1) | Particulars<br>(2)    | Cost in Lakh                  |      |                |                                           |      |                |                                                                               |      |                            | Projected/actual cost of Deferred work to be capitalised after COD but before cut-off date (7) | Variation between actual Cost and IA/RCE cost as on COD (8=(5-6+7)-(3 or 4)) | Reasons for Variation <sub>1</sub> (9) | Un-Discharge Liabilities included in Col. 5 (10) | Admitted cost (11) | Capital Work in Progress as per Books of Account as on COD (12) |                                                                                                                                            |
|---------------|-----------------------|-------------------------------|------|----------------|-------------------------------------------|------|----------------|-------------------------------------------------------------------------------|------|----------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------|--------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|               |                       | As per Original Estimates (3) |      |                | As per Revised Cost Estimates (if any)(4) |      |                | Actual Capital Expenditure (Gross Block) as on COD as per Books of Account(5) |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 | The portion Capital cost included in col. 5 which is not eligible for transmission tariff (eg. Grant, other business etc. <sup>3</sup> (6) |
|               |                       | Quantity                      | Rate | Estimated Cost | Quantity                                  | Rate | Estimated Cost | Quantity                                                                      | Rate | Gross Block of the account |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| D             | Energy Storage System |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 15            |                       |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 15.1          | Preliminary Works     |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |

| S. No.<br>(1) | Particulars<br>(2)                                                        | Cost in Lakh                  |      |                |                                           |      |                |                                                                               |      |                            | Projected/actual cost of Deferred work to be capitalised after COD but before cut-off date (7) | Variation between actual Cost and IA/RCE cost as on COD (8=(5-6+7)-(3 or 4)) | Reasons for Variation <sup>1</sup> (9) | Un-Discharge Liabilities included in Col. 5 (10) | Admitted cost (11) | Capital Work in Progress as per Books of Account as on COD (12) |                                                                                                                                            |
|---------------|---------------------------------------------------------------------------|-------------------------------|------|----------------|-------------------------------------------|------|----------------|-------------------------------------------------------------------------------|------|----------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------|--------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|               |                                                                           | As per Original Estimates (3) |      |                | As per Revised Cost Estimates (if any)(4) |      |                | Actual Capital Expenditure (Gross Block) as on COD as per Books of Account(5) |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 | The portion Capital cost included in col. 5 which is not eligible for transmission tariff (eg. Grant, other business etc. <sup>3</sup> (6) |
|               |                                                                           | Quantity                      | Rate | Estimated Cost | Quantity                                  | Rate | Estimated Cost | Quantity                                                                      | Rate | Gross Block of the account |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 15.2          | Energy Storage system equipment's                                         |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 15.3          | Taxes and Duties                                                          |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 15.4          | <b>Total (ESS)</b><br>(15.1+15.2+15.3)                                    |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 16            | <b>Cost of Plant &amp; Machinery</b><br>(10.0+15.4)                       |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 17            |                                                                           |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 17.1          | <b>Construction and pre-commissioning expenses</b>                        |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 17.1          | Site supervision & site administration .etc.                              |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 17.2          | Tools and Plants                                                          |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 17.3          | construction Insurance                                                    |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 17.4          | <b>Total Construction and pre-commissioning expenses</b> (17.1+17.2+17.3) |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 18            | <b>Overheads</b>                                                          |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 18.1          | Establishment                                                             |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 18.2          | Audit & Accounts                                                          |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |

| S. No.<br>(1) | Particulars<br>(2)                                                        | Cost in Lakh                  |      |                |                                           |      |                |                                                                               |      |                            | Projected/actual cost of Deferred work to be capitalised after COD but before cut-off date (7) | Variation between actual Cost and IA/RCE cost as on COD (8=(5-6+7)-(3 or 4)) | Reasons for Variation <sup>1</sup> (9) | Un-Discharge Liabilities included in Col. 5 (10) | Admitted cost (11) | Capital Work in Progress as per Books of Account as on COD (12) |                                                                                                                                            |
|---------------|---------------------------------------------------------------------------|-------------------------------|------|----------------|-------------------------------------------|------|----------------|-------------------------------------------------------------------------------|------|----------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------|--------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|               |                                                                           | As per Original Estimates (3) |      |                | As per Revised Cost Estimates (if any)(4) |      |                | Actual Capital Expenditure (Gross Block) as on COD as per Books of Account(5) |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 | The portion Capital cost included in col. 5 which is not eligible for transmission tariff (eg. Grant, other business etc. <sup>3</sup> (6) |
|               |                                                                           | Quantity                      | Rate | Estimated Cost | Quantity                                  | Rate | Estimated Cost | Quantity                                                                      | Rate | Gross Block of the account |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 18.3          | Contingency                                                               |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 18.4          | Other overheads                                                           |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 18.5          | <b>Total Overheads</b><br>(18.1+18.2+18.3+18.4)                           |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
|               |                                                                           |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 18            | <b>IDC, FC, FERV &amp; Hedging Cost</b>                                   |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 19.1          | Interest During Construction (IDC)                                        |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 19.2          | Financing Charges (FC)                                                    |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 19.3          | Foreign Exchange Rate Variation (FERV)                                    |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 19.4          | Hedging Cost                                                              |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 19.5          | <b>Total of IDC, FC, FERV &amp; Hedging Cost</b><br>(19.1+19.2+19.3+19.4) |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
|               |                                                                           |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |
| 20            | <b>Capital cost including IDC, FC, FERV &amp; Hedging</b>                 |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                |                                                                              |                                        |                                                  |                    |                                                                 |                                                                                                                                            |

| S. No.<br>(1) | Particulars<br>(2)               | Cost in Lakh                  |      |                |                                           |      |                |                                                                               |      |                            | Projected/actual cost of Deferred work to be capitalised after COD but before cut-off date<br>(7) | Variation between actual Cost and IA/RCE cost as on COD (8=(5-6+7)-(3 or 4)) | Reasons for Variation <sup>1</sup><br>(9) | Un-Discharge Liabilities included in Col. 5 (10) | Admitted cost (11) | Capital Work in Progress as per Books of Account as on COD (12) |                                                                                                                                            |
|---------------|----------------------------------|-------------------------------|------|----------------|-------------------------------------------|------|----------------|-------------------------------------------------------------------------------|------|----------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------------|--------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|               |                                  | As per Original Estimates (3) |      |                | As per Revised Cost Estimates (if any)(4) |      |                | Actual Capital Expenditure (Gross Block) as on COD as per Books of Account(5) |      |                            |                                                                                                   |                                                                              |                                           |                                                  |                    |                                                                 | The portion Capital cost included in col. 5 which is not eligible for transmission tariff (eg. Grant, other business etc. <sup>3</sup> (6) |
|               |                                  | Quantity                      | Rate | Estimated Cost | Quantity                                  | Rate | Estimated Cost | Quantity                                                                      | Rate | Gross Block of the account |                                                                                                   |                                                                              |                                           |                                                  |                    |                                                                 |                                                                                                                                            |
|               | Cost<br>(10+11.4+12.5+13.5+19.5) |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                   |                                                                              |                                           |                                                  |                    |                                                                 |                                                                                                                                            |
|               |                                  |                               |      |                |                                           |      |                |                                                                               |      |                            |                                                                                                   |                                                                              |                                           |                                                  |                    |                                                                 |                                                                                                                                            |