ODISHA ELECTRICITY REGULATORY COMMISSION
BIDYUT NIYAMAK BHAWAN
PLOT NO.-4, CHUNUKOLI, SHAILASHREE VIHAR
BHUBANESWAR - 751 021
****

Present: **Shri U. N. Behera, Chairperson**
Shri S. K. Parhi, Member
Shri G. Mohapatra, Member

Case No. 66/2021

OPGC	………	Petitioner
Vrs.		
GRIDCO & Others	…………	Respondents

In the matter of: **Application under Regulations 13 & 14 of the OERC (Terms and Conditions for Determination of Generation Tariff) Regulations read with other relevant provisions of OERC (Conduct of Business) Regulations, 2004 for in principle approval of Capital Cost for renovation & Modernisation work and installation of FGD for Units 1 & 2 (2X220MW).**

For Petitioner: Shri Haresh Satpathy, Shri Prakash Dora, Shri Nrusingha Panda and Shri Sukanta Mohapatra

Respondent: Ms. Susmita Mohanty, AGM (PP), GRIDCO, Shri V. Wagle, TPCODL, Shri K. C. Nanda, DGM (Fin.), TPWODL, Shri Pratap Mohanty, TPNODL, Shri Binod Nayak, Asst. GM (Comm.), TPSODL and Shri R. P. Mahapatra.

Nobody is present on behalf of DoE, GoO.

ORDER

Date of hearing: 21.09.2021 **Date of order:03.11.2021**

The petitioner OPGC has filed the present petition seeking in-principle approval of capital cost for renovation and modernisation work and installation of FGD of the generating Units 1 & 2 having capacity of 420 MW (2 x 210 MW) of its thermal power station at Banharpalli, Jharsuguda.

2. OPGC has submitted that Unit 1 & 2 were first commissioned in the year 1994-95 and 1996-97 respectively. It has PPA with GRIDCO which is valid till end of June, 2026. After operation of 26 and 24 years the performance of the units has deteriorated resulting in forced outages, reduced output, decrease efficiency and increase in cost of generation. Hence it is proposed to carry out required refurbishments and replacement of the plant so as to restore the performance parameters like achieving normative availability factor,

restoration and sustenance of unit load and heat rate, reduction in auxiliary consumption and complying revised emission norms and also to extend the life of the plant at least for a period of 15 years beyond 2026. Accordingly, as approved by its Board of Directors in their meeting in May, 2018, an expert agency namely, M/s.IRC Engineering Service India Pvt. Ltd., was engaged in December, 2018 for carrying out the R & M assessment study following CEA guidelines and the firm submitted its report in May, 2019. The DPR was prepared by the agency for the R & M study on the basis of the RLA/CA study and condition assessment studies.

3. OPGC has submitted that the RLA/CA, Thermal Performance Test and EA studies have indicated the measures to be undertaken for a sustainable generation capacity and extension of life by 15 years. It has been envisaged to complete the R & M job within a period of two years with 80 days (Capital Overhauling of 50 days and Annual Overhauling of 30 days) of shut down for each unit. The benefits anticipated to accrue on implementation of the R & M Projects are as follows:

- Life of the units will be extended by 15 years beyond 2026.
- Rated capacity/design capacity of 210 MW will be restored.
- Forced outages reduction by 3 to 4%
- PLF improvement by about 10%
- Higher safety for operational personnel & equipment and Savings in maintenance expenditure, fuel oil consumption & Auxiliary power consumption.
- Taking care of obsolescence in Equipment and Systems
- Low capital investment towards R&M (Rs.1.8 Cr/MW) of equivalent additional capacity
- Lower cost of generation
- No requirement of rehabilitation & resettlement of people
- No need for additional infrastructure support.

4. OPGC has submitted that since last four years there has been accelerated deterioration of the performance of the units with respect to station heat rate, auxiliary consumption and specific oil consumption with increase in forced outage rate due to failure of critical equipment because of ageing. In order to improve the operational efficiency and life

expectancy of the generating units, R&M works shall have to be carried out in Boiler and Turbine, Electrical System, C&I, CHP and AHP, Ash Pond etc. The R&M work would be carried out by replacing obsolete elements and replacing worn out equipment to extend the life of the plant and to improve the operational parameters. The estimated cost of recommended R&M work is approximately Rs.561 crore which includes the cost of erection and commissioning. Further, considering the project duration of two years and present interest rate of 11%, the total cost of the project is estimated to be approximately Rs.760 crore. The project shall be serviced with debt, equity ratio of 70:30. The cost estimate as worked out and included in this report are considered to be reasonable which is given below:

Sl. No.	Particulars	Amount (Rs. Cr.)
1	Boiler and Auxiliaries	62.00
2	Turbine and Auxiliaries	140.00
3	Electrical System	78.05
4	C&I	29.70
5	CHP	28.60
6	AHP	50.00
7	Ash Pond	140.00
8	Miscellaneous Works	32.65
A	**Total Cost of Equipment's (supply & installation)**	**561.00**
	GST, @18%	100.98
	Contingency charges considering @3%	19.86
B	**Total Project Cost**	**681.84**
	IDC (Interest Rate 11%)	75.00
	Total Project Cost including IDC	**756.84**

5. OPGC has further submitted that Ministry of Environment, Forests and Climate Change (MoEFCC) vide Notification dated December 7, 2015 notified the Environment (Protection) Amendment Rules, 2015, thereby amending the Environment (Protection) Rules, 1986, which mandatorily required all operating thermal power plants to comply with the revised environmental norms on or before 06.12.2017, i.e., within a period of 2 years from the date of above mentioned notification. As per the said Notification the generating units of the thermal power station shall comply as follows:

Sr. No.	***Industry***	***Parameter***	***Standards***

1	*2*	*3*	*4*
"25.	***Thermal Power Plant***	***……. TPPs (units) to be installed from 1st January, 2017*****	
		Particulate Matter	*100 mg/Nm^3*
		Sulphur Dioxide (SO_2)	*600 mg/Nm^3*
		Oxides of Nitrogen (NOx)	*600 mg/Nm^3*
		Mercury (Hg)	-

6. Thereafter, OPGC floated tender for appointment of Technical Consultant and appointed M/s Black and Veatch Ltd. ("B&V") on 17th May 2016 for carrying out the feasibility study, recommending appropriate technological solution for meeting the revised emission norms, submit Detailed Project Report to that effect and support in preparation of tender document. B&V submitted its report in November, 2017 suggesting semi-dry FGD with flue gas emission system for OPGC Units 1 & 2 based on the market study conducted at that time for smaller size units. Subsequently, based on NTPC experience in implementation of FGD, another assessment was done in 2019 and concluded that wet FGD with FGC is going to be more economical looking at various aspects such as:

   (a) Well established FGD technology on a variety of world coals with proven reliability.

   (b) SO_2 removal upto 95% are common and removals as high as 98% can be attained.

   (c) Adequate and commercially viable suppliers offer the technology

   (d) Reagents used by the process are plentiful and readily available

   (e) Waste gypsum is stable for landfills without blending with fly ash and lime and it can also be designed to produce wallboard-grade gypsum as a sealable by-product

   (f) The FGD system is not sensitive to boiler operational aspects like cyclical variations.

7. In order to factor in the prevailing market situation, B & V was consulted again to revisit the previous proposal. Subsequently, B & V submitted a revised report on 25th June, 2021, which was further updated on 13th July, 2021, suggesting the following solutions for SO_x and PM abatement,

   - Wet Limestone Based Flue Gas Desulphurization System for SO_x abatement;

   - Flue Gas Conditioning System for PM abatement;

   As presently the Units 1 & 2 of OPGC are accomplishing the NO_x and Mercury standard and there is no requirement to reduce it further.

8. In the meantime Central Pollution Control Board (CPCB) vide its notice dated 11.12.2017 directed OPGC to comply the following:

- The plant shall meet emission limit of PM by installing Electrostatic Precipitator (ESP) by 30.09.2021 in Units 1 & 2
- The plant shall install FGD by 30.09.2021
- The plant shall take immediate measure like installation of low NO_x burners, providing Over Fire Air (OFA) etc. and achieve progressive reduction so as to comply NO_x emission limit by the year 2022.

9. In accordance with the amendment issued by MoEF & CC on 28 June 2018 and as mandated in the new advisory issued by CEA for implementation beyond 21st February, 2019 onwards, the stack height post FGD and water consumption were stipulated as follows:

Parameter	***Standards***
Stack height post FGD in meters	*H= 6.902 (QX0.277)*$^{0.555}$ *Or* *100 Meters whichever is more*
Specific water consumption	*All existing CT-based plants to reduce specific water consumption upto maximum of 3.5 m*^{3} *per MWh within a period of two years from the date of publication of notification.*

10. Ministry of Power, GoI vide a communication dated 30.05.2018 has requested CERC to allow pass through of environment retrofit costs through tariff. Further, CEA vide its Notification dated 21.02.2019, issued technical standards and benchmark costs for implementation of FGD. Thereafter, OPGC submitted the Detail Project Report (DPR) of FGD implementation for its Units-1 & 2 on 14.03.2019 for getting endorsement. CEA vide its communication dated 28.03.2019 has returned the report and advised to follow the guiding norms notified by CEA from time to time and the power plant may decide on the feasible technologies. CEA also advised that OPGC may approach their concerned regulator for future course of action in this regard.

11. OPGC has stated that in the interim period due to the unset of COVID 19 pandemic, most of the development activities across the country were affected. Hence, MoEF&CC vide notification dated 01.04.2021 modified the timelines for implementation of the terms as notified in 2015 based on the categories identified by the Task Force formed by the

members of MoEF&CC, CEA and CPCB. OPGC Units-1 & 2 being situated within 10 kms radious of Critically Polluted Areas or Non-attainment cities (as defined by CPCB), was put under Category-B. Accordingly, OPGC has to comply emission standards on or before 31.12.2023, as the Units-1 & 2 are not retiring. Otherwise 31st December, 2025 is the outer date for continuing operations for retiring units. Failing to comply the above timeline, the thermal power plant shall have to pay a penalty varying from 7 paise to 15 paise per unit of generation from the plants. In view of the above, OPGC has submitted that in order to comply with the revised emission norms of SO_x and Particulate Matter, the following technology/equipment need to be installed for Units-1 & 2:

(a) Wet Flue Gas Desulphurisation (FGD) system, for controlling SO_x emissions

(b) Flue Gas Conditioning (FGC) or any other suitable system for complying with emission norms of Suspended Particulate Matter (SPM).

(c) OPGC has submitted the indicative capital cost for implementation of FGD and FGC system for its Units-1 & 2 as given in the table below:

Sl No.	Particulars	Estimated Capex (Rs. Cr.)
Indicative Capital Expenditure for FGD		
1	Purchased Equipment Cost	299.46
2	Installation Cost	141.69
3	**Direct Cost (1+2)**	**441.15**
4	Indirect Cost	41.91
5	Allowance for Interest During Construction	66.42
	Sub-Total (A) (3+4+5)	**549.48**
Indicative Capital Expenditure for FGC		
1	Purchased Equipment Cost	19.96
2	Installation Cost	6.53
3	**Direct Cost (1+2)**	**26.49**
4	Indirect Cost	2.52
5	Allowance for Interest During Construction	1.28
	Sub-Total (B) (3+4+5)	**30.29**
	Total (A+B)	**579.77**

12. OPGC has submitted that the indicative capital costs for wet FGD and FGC system, indicated in the above table, were developed based on previous budgetary proposals, estimates by the Consultant of past projects, equipment/material cost estimates, as estimated and provided by M/s. Black & Veatch (B&V). The indirect cost includes contingencies and owner’s cost. OPGC has submitted that the indicative capital cost shown in the table includes the following features:

a) Flue Gas Desulfurization Vessels and Associated Equipment.

b) New stack with borosilicate glass lining for acid corrosion protection

c) Flue Gas Ductwork

d) Draft System Stiffening

e) Tanks, pumps and interconnecting Piping

f) New centrifugal ID fans, VFDs and supporting equipment

g) Auxiliary Transformers and Electrical equipment

13. OPGC has submitted that it is entitled to consider opportunity cost as part of the capital cost in line with the recommendation of CEA for other projects installing FGD. However, since installation period would depend on actual progress with reference to plan as well as consultation with GRIDCO on unit shutdown during the time of installation, OPGC prayed to allow the opportunity cost at the time of true up based on actual time of shutdown and proportionate AFC to be approved for the respective period.

14. OPGC has submitted that on installation of the FGD and FGC system the O&M expenses would increase on account of running operation cost of the consumables like limestone cost for the FGD plant and sulphur cost for the FGC plant, costs towards disposal of by-products and wastes such as gypsum etc. Further the maintenance spares and services of contracted/outsourced manpower would also be required to ensure the availability and reliability of the system. There will be increase in auxiliary consumption due to FGD system. All these would lead to increase in capacity charges of the power plant. The energy charge rate will also increase due to consumable cost (limestone, sulphur and water) and increase in auxiliary consumption (impact on ED charges and heat rate). The tariff implication has been worked out with the following considerations/ assumptions.

a) Capex (including IDC) for R&M and FGD/FGC are Rs.760 Cr. and Rs.580 Cr. respectively.

b) Life extension shall be for a period of 15 years. A new PPA shall be entered with GRIDCO for the extended term/life of the plant i.e. till June, 2042

c) Terms of OERC Generation Tariff Regulations, 2020 have been considered for the extended term of contract i.e. beyond June, 2026, assuming escalations as provided in the said Regulation.

d) Commissioning dates for the three project components have been considered as (i) FGD/FGC – December, 2023, (ii) R&M – December, 2024 and (iii) Ash pond – January, 2025.

e) Debt equity ratio has been considered at 70:30

f) Long term borrowing interest rate has been considered at 8.50% and working capital interest rate at 10% (SBI MCLR of 7% + 300 BP)

g) Auxiliary consumption has been assumed to be increased by1% due to installation of FGD and FGC

h) Additional O&M expenses (levelised) of Rs.43.50 Cr./annum has been considered on account of FGD/FGC implementation as provided in the DPR.

i) O&M inflation rate has been considered as 3.50% as per OERC Generation Tariff Regulation, 2020.

j) Discounting factor for calculating levelised tariff has been taken at 10.75%, which is the weighted average cost of capital.

k) For energy charge calculation, GCV of coal has been considered at 2900 Kcal/kg, cost of coal at Rs.1573/MT, cost of LDO at Rs.46345/KL.

l) Water charges has been considered at Rs.8.37 Cr./year, based on current charges.

15. Based on the above assumptions, levelised tariff on account of R&M and implementation of FGD has been computed by OPGC has given in the table below:

Levelised Tariff	**Units**	**Tariff after R&M with installation of Wet FGD and 15 year life extension**
Due to R&M/Ash Pond	Rs./kWh	0.41
Due to FGD/FGC	Rs./kWh	0.45
Due to original project cost	Rs./kWh	1.11
Total Fixed Charge	**Rs./kWh**	**1.97**
Energy Charge Rate	Rs./kWh	**1.51**
Total Levelised Tariff	Rs./kWh	**3.49**

16. OPGC has submitted that there is an incremental tariff of Rs.0.86/kWh over the AFC on account of original capital cost which is estimated to be Rs.1.11/kWh in accordance with OERC Generation Tariff Regulations. The ECR of post implementation of FGD is estimated to be Rs.1.51/kWh and total tariff to be Rs.3.49/kWh. OPGC has submitted that on comparison with tariff of other thermal generating stations including IPPs and CGS, this estimated tariff of OPGC Units-1 & 2 after R&M and installation of FGD/FGC, is

competitive. The investment is beneficial to the State and GRIDCO as there is no additional cost on infrastructure for the main plant and power can be supplied using the existing OPTCL transmission line, thus there is no incidence of high CTU charges.

17. OPGC has submitted that they have made a detailed presentation to the Senior Management of GRIDCO on 28.04.2021 presenting the cost benefit analysis and tariff implication of the proposed R&M work and extension of life period of the plant for 15 years along with implementation of FGD. Thereafter, the written proposal was sent to GRIDCO and in response GRIDCO vide its Letter on 20.05.2021 had extended in-principle support to the proposal, subject to seeking in-principle approval of the Commission on the proposed investment in compliance with the provisions of OERC Generation Tariff Regulations, 2020.

18. In view of the above OPGC has prayed the Commission to Grant in-principle approval to OPGC to incur the capital expenditure as proposed in the present petition and approve the estimated capital cost of approximately Rs.760 Cr. towards R&M works for enhancement of life of the plant and approximately Rs.580 Cr. towards compliance of revised emission norms in respect of FGD & FGC, subject to actual cost and truing up.

19. The respondent GRIDCO has submitted that the Commission vide its order dated 27.04.2015 has approved the amended PPA dated 19.12.2012 executed between OPGC and GRIDCO in respect of Stage-I (Units-1 & 2) of OPGC. As per PPA, the provisions of the PPA shall be applicable till the end of the term of PPA i.e. till June, 2026 for determination of tariff of OPGC Stage-I. As per the application of OHPC, the Units-1 & 2 has completed their useful life of 26 and 24 years of operation and over the past few years there has been continuous deterioration of units performance with respect to Station Heat Rate (SHR), Auxiliary Power Consumption and Specific Oil Consumption along with forced outage on account of failure of critical equipment due to ageing. Therefore, OPGC has proposed for R&M works of Units-1 & 2 with an estimated cost of Rs.756.84 crore including GST and IDC. As per the stipulations in the guidelines of CEA in respect of R&M works, OPGC should place on record before the Commission, the performance guarantees/improved operational parameters vis-a-vis current figures of operational parameters (not the relaxed norms) to be achieved after R&M works. GRIDCO has submitted that in order to refurbish the units in a cost effective manner so as to extend its life, improve operational efficiency and life expectancy of the project and to ensure that its performance is in compliance with the revised statutory standards, GRIDCO has no

objection, subject to prudence check of estimated cost and proposed technology by the Commission and subject to fulfilment of the following conditions:

i. Extension of useful life of both the thermal Units by at least 15 years from date of completion of R & M work;

ii. Norms of operation shall be as per the extant Regulations framed by OERC from time to time;

iii. No further R & M expenditure shall be allowed till completion of 15 years from the date of completion of R & M work;

iv. R & M work must be expedited and completed by OPGC on or before expiry of useful life in 2026;

v. Proper project planning to avoid cost and time escalation;

vi. Prudent approach towards Cost optimisation by OPGC, so as to reduce burden on consumers of the State;

20. GRIDCO has further submitted that OPGC has estimated to invest Rs.140 Crore for construction of one new Ash pond as part of its proposed R&M cost on the ground that the existing ash pond can cater up to 2026. GRIDCO submitted that the Ministry of Environment and Forest Notification 1999, 2003, and 2009 stipulates that:

(a)All Coal based thermal power Stations would be free to sell fly ash to the user agencies subject to the following conditions:-

(a.1) Pond ash should be made available free of any charge on "as is where basis" to manufacturers of bricks or tiles including clay fly ash product manufacturing units(s), farmers, the Central and the State road construction agencies Public works Department, and to agencies engaged in back filling or stowing of mines.

(a.2) At least 20% of dry ESP fly ash shall be made available free of charge to units manufacturing fly ash or clay-fly ash bricks, blocks and tiles on a priority basis over other users and if the demand from such agencies falls short of 20% of quantity, the balance quantity can be sold or disposed of by the power station as may be possible.

(a.3) All coal based thermal power stations and, or expansion units in operation before the date of issuance of notification must achieve the 100% target of ash utilization within five years.

(a.4) All new coal based thermal power stations or expansion units to achieve 100% ash utilization within four years from the date of commissioning.

21. GRIDCO has submitted that OPGC has failed to achieve the 100% of ash utilization, as contemplated in the above MoEF Notification and its subsequent amendments. Had the Petitioner (OPGC) complied with the MoEF notification for 100% ash utilization from the existing ash pond, there would have been no requirement of going for a new ash

pond, as the existing ash pond would have fulfilled the need of Ash disposal. Thus the cost implication due to failure/inefficiency of the Petitioner to comply the MoEF directives for 100% ash utilisation is wholly attributable to the Petitioner, which cannot be passed on to GRIDCO and ultimately the consumers. In view of the above, OPGC may be directed to achieve 100% ash utilisation from the existing ash pond in accordance with MoEF Notifications so as to utilise the same beyond the year 2026 instead of going for a new ash pond at a huge cost of Rs.140 Crores without any tariff burden on the State consumers.

22. GRIDCO has further submitted that as per the submission of OPGC the option of life extension and installation of FGD to meet the revised emission norms, required a composite approach to view the total capital investment requirement and commercial viability in terms of recovery of cost as a pass through in tariff. GRIDCO submitted that, in respect of NTPC thermal stations, the cost estimate for FGD for 4 x 210MW Units of Kahalgaon Stage-I Power Station is Rs.519.17 Crores (Rs.0.618 Cr./MW) vis-à-vis estimated CAPEX of FGD by OPGC for its 2 x 210MW Units submitted to be Rs.549.48 Crores (Rs.1.3083 Cr./MW). From this it is evident that the estimated cost of OPGC is abnormally very high in comparison to that by NTPC. Further, the cost estimation given by CEA for 210 MW Unit is Rs.0.45 Cr./MW. In view of the above, the Commission may accord in-principle approval to OPGC for such cost of FGD after prudent check of the estimated cost and proposed technology so as reduce burden on the consumers of the State with abnormally higher tariff due to cost of FGD.

23. GRIDCO has further submitted that as per the Tariff order dated 26.03.2021 in Case No. 71 of 2020 of OPGC Stage I for FY 2021-22, total tariff of 248.45 Paise/kWh (Fixed Charges 95.64 Paise/kWh and Energy Charge Rate(ECR) of 152.81Paise/kWh), which is one of the cheapest source of power available within the State at present. However, on implementation of the aforesaid proposal, as estimated by OPGC, there will be an increase of about 101.36 Paise/kWh in tariff of OPGC Stage I. OPGC has considered GCV value of coal as 2900 Kcal/Kg for Energy Charge calculation. But “As Received” GCV of linkage coal as per OERC order dated 28.10.2020 in Case No. 43 of 2017 cannot be as low as 2900 Kcal/kg when the grade of GCV is G14/G13 (it depends on annual notification by MCL). CEA in its advice on FGD and FGC Technology (to be applicable from 07.02.2020 onwards) has stipulated inter-alia the coal quality as a factor before finalization of FGD and FGC Technology. But, OPGC has not furnished the details of

Coal quality used in the above generating Station as per aforementioned Commission's order. Therefore, OPGC may be directed to furnish information pertaining to "As received" GCV of coal.

24. In view of the aforementioned submissions, GRIDCO has prayed the Commission to kindly consider the followings:-

1) In principle approval may be accorded for R & M and FGD/FGC installation at OPGC Stage I subject to the following conditions:

a) Estimated R & M expenditure of Rs.140 Crores for construction of Ash Pond may not be allowed as the existing ash pond can be utilised by achieving 100% ash utilisation as per MOEF Notification .

b) Extension of useful life of both the thermal Units by at least 15 years from date of completion of R & M work;

c) Norms of operation shall be as per the extant Regulations framed by OERC from time to time;

d) No further R & M expenditure shall be allowed till completion of 15 years from the date of completion of R & M work;

e) R & M work must be expedited and completed by OPGC on or before expiry of useful life in 2026;

f) Proper project planning to avoid cost and time escalation;

g) It is further submitted that, OPGC may prudently explore the possibility of optimization of the proposal, both technically and commercially. OPGC may target mainly towards Low capital investment, so as to reduce burden on consumers of the State

2) To Direct OPGC to place the following documents on record:

a. Certificate to the effect that FGD and FGC technology adopted would meet the evaluation criteria as indicated by CEA in its advisory dated 07.02.2020 and would also meet the Environmental emission norms specified by MoEF&CC;

b. Detailed note with regard to selection of technology for SO_2 control and particulate matter for the subject power plant based on the evaluation criteria as indicated by CEA in its advisory dated 07.02.2020;

c. Detailed note on bidding (ICB or domestic) for award of different packages of FGD/FGC system (firm basis or escalation basis), number and names of the bidders who participated in the bid and name of the L-1 bidder/s with awarded cost of each package, if already awarded;

d. Resolution of the Board/ decision of the competent authority to go ahead with the bidding and award of the contract(s), if already awarded;

e. Break-up of the capital cost claimed including awarded capital cost of different packages, IEDC, IDC, taxes and duties considered, opportunity cost for shutdown period and any other cost;

f. Plant Audit Report regarding FGD/FGC installation shall be provided to GRIDCO along with information regarding useful life of FGD/FGC;

g. Information regarding non-tariff income from sale of by-product;

h. Appropriate contingency planning for shutdown during the implementation of proposed R&M, Additional Capitalization work to minimize the generation loss;

i. R & M and FGD/FGC installation shall be completed within stipulated time, GRIDCO shall not bear any additional expenditure on account of time over run/cost over-run (if any);

3) OPGC should ensure the following anticipated benefits/advantages as mentioned in the DPR on R & M and its submission:

i. Life of Unit will be extended by 15 years beyond 2026;

ii. Rated Capacity/Design capacity of 210 MW will be restored if not improved;

iii. Force outages will be reduced;

iv. Higher safety for operational personnel and equipment;

v. Savings in maintenance expenditure, fuel oil consumption and Auxiliary power consumption;

vi. Low capital investment per MW of equivalent additional capacity.

vii. Shorter shutdown period;

viii. Lower cost of generation;

ix. No requirement of rehabilitation and resettlement of people;

x. No need for additional infrastructure support;

xi. Further, if State is deficit in power generation and is importing power to make up deficit, the extent of incremental energy becoming available from the units after R & M would reduce the power purchase requirement and equivalent cost burden;

xii. It will lead to carbon emission reduction and energy efficiency improvement which in turn shall enable earning carbon credit and energy efficiency credit that can be sold and serve as an additional revenue stream;

4) Tariff of power procurement shall be determined by OERC based on Tariff Regulations framed from time to time.

5) Concessional Coal i.e. Linkage coal /cheaper coal through SHAKTI Schemes/Policy as notified by Coal India Ltd/Ministry of Coal shall be utilized for generation of power.

6) OPGC and GRIDCO shall execute a separate PPA for the extended useful life of 15 years beyond June, 2026 after in principle approval is accorded by the Commission in the present application for executing R & M for extension of life and installation of FGD and FGC for adhering to the new emission control norms. The tariff of extended period shall be as per the OERC Tariff Regulations from time to time. Such PPA shall be placed before the Commission for approval before the expiry of the terms of existing PPA in June, 2026.

25. In its additional submission GRIDCO has submitted that, the Stage I of the power plant of OPGC has already depreciated and repayment of Loan completed in 2012 and the

existing PPA is valid till 2026.The following expected benefits are anticipated from the OPGC proposal of R & M and ECS installation:

a) Power shall be available at STU network. Thus, there shall be no implication of POC Charges & Losses.

b) FSA is valid till 2039 and with extension of useful life by 15 years, power shall be available till 2041. OPGC can use its captive coal for the balance two years.

c) Current Tariff is 248.45 Paise/kWh (FC: 95.64 + VC: 151.81) and as per OPGC proposal the Levelized tariff estimated is 349 Paise /kWh (FC: 197 + ECR: 151). The tariff may further reduce after prudent scrutiny by the Commission.

d) Norms of operation shall be as per the extant Regulations framed by OERC from time to time.

e) Compliance of new Environmental Emission Control Norms.

f) Earning carbon credit and energy efficiency credit that can be sold and serve as an additional revenue stream.

g) Low Capital Investment per MW of equivalent additional capacity.

h) No need for additional infrastructure support.

i) No requirement of rehabilitation and resettlement of people.

j) Improvement in operational parameters:

    a) Increase in PLF: By 10%.

    b) Reduction in Fuel Oil Consumption and APC%: By 3% to 4%.

    c) Shorter shutdown period.

k) Savings in maintenance expenditure.

l) Restoration of Rated Capacity/Design Capacity.

m) Higher safety for operational personnel and equipment

26. However, with regard to implementation of the proposed R & M and ECS installation, GRIDCO submitted that:

a. Proposed per MW expenditure towards ECS Installation appears to be at higher side;

b. If proposed works are not completed in scheduled time, it shall lead to time overrun and cost overrun, thereby escalating tariff;

c. Proposed R&M expenditure of Rs.140 Crores for the construction of Ash pond may not be required if 100% Ash Utilization as per MoEF Notification 1999, 2003 and 2009 is carried out.

d. R&M work and ECS Installation must be expedited by proper project planning and completed on or before 2026 to avoid chances phasing out of the thermal units.

e. Extension of Useful life may be allowed from end of the useful life in 2026 or from the date of completion of proposed work whichever is later.

f. Execution of a fresh/separate PPA shall be made incorporating provisions for determination of tariff as per OERC Regulations notified from time to time for the extended useful life of 15 years.

27. In view of the above facts and submissions, GRIDCO has submitted that it will be advantageous for GRIDCO to agree for R & M work of OPGC Stage I along with Installation of ECS so as to avail full entitlement of power from extended useful life of 15 years beyond June, 2026 in view of the following important aspects:

a) This is a STU connected power station, hence no CTU charges will be applicable.

b) The indicative tariff after R&M and installation of FGD is reasonable and subject to OERC Tariff Regulation from time to time.

28. With recent trend of increase in State power demand and surrender of capacities, power deficit situation in near future is anticipated. In this regard, the provisional Load Generation Balance Reports (LGBR) showing Power Supply & Demand Projection for the period from FY 2021-22 to FY 2029-30 with annual Average Demand and Peak Demand separately, as estimated by GRIDCO. The shortfall in peak demand is estimated at 1105 MW in FY 2026-27 which may be increased upto 1195 MW in FY 2029-30. Similarly the shortfall in average demand is estimated at 5 MW in 2026-27, but in FY 2029-30 a surplus of 256 MW in average demand is estimated. The projection is based on certain assumptions on power demand and supply, which are dynamic in nature and therefore, the power from OPGC Stage 1 is critical for GRIDCO for fulfilling the future demand of the State.

29. GRIDCO submitted that in the above background, approval of the proposal of OPGC for CAPEX may be accorded by the Commission after prudent check by the Commission as per Regulation 13(2), 14(3) and 17(1) of OERC Tariff Regulation, 2020. OPGC and GRIDCO shall execute a separate PPA for the extended useful life of 15 years beyond 2026 after approval is accorded by the Commission. The tariff of extended period shall be as per the OERC Tariff Regulations notified from time to time. Such PPA shall be placed before the Commission for approval before expiry of the terms of existing PPA in 2026.

30. The respondent TPWODL has submitted that OPGC in its present petition has not submitted the detailed breakup of the proposed capital cost and any study regarding bench marking cost in respect of R&M of thermal power plant. Further, the cost benefit analysis on the R&M works has not been narrated. Therefore, TPWODL is unable to verify/scrutinized the prudence of proposed estimated project cost.

31. TPWODL has further submitted that considering the RE power policy of Government of India and increase in RE installed capacity in the past year, the investment proposal of about Rs.1350 Cr. by OPGC towards R&M of its 420 MW thermal power plant seems to be not a prudence decision to compete with overall power purchase cost of different generators. Further, GRIDCO is retiring its PPAs with high cost thermal power plant and fulfilling the requirement through RE sources. In recent development Govt. of India, Ministry Power has circulated a draft for promoting renewable energy through Green Open Access Mechanism and is also proposing in Green Energy Tariff which has a great challenge for the thermal generators to recover their capital cost through generation tariff which may also affect the average power purchase cost of GRIDCO. In view of the above the Commission may take a suitable decision as the power purchase cost of DISCOMs may be affected by this capital investment of OPGC.

32. The respondents TPNODL & TPSODL have submitted similar views. They have submitted that the proposed investment Rs.1350 Cr. by OPGC will affect the power purchase cost of DISCOMs and also will impact on RST to large extent. As proposed by OPGC, its generation tariff will be Rs.3.49/kWh after R&M of the power plant, hence, the average power procurement cost of GRIDCO will rise which will impact the consumer tariff. They submitted that the proposed capital expenditure towards R&M should not be allowed in tariff and OPGC may meet the proposed investment from its internal cash flows/resources which have been gained by it over the years through the relaxed parameters of PPA. The respondent TPCODL has not furnished its views on the present petition of the OPGC.

33. The respondent Shri R.P.Mahapatra has submitted that OPGC has enjoyed huge benefits in variable charges on application of the tariff provisions of the PPA based on the judgment of Hon'ble Supreme Court and in fixed charges based on Govt. of Odisha Notification of 2008. Now, OPGC is stating that the normative parameters in the OERC Generation Tariff Regulations, 2020, as amended from time to time, shall be applicable after the R&M of the power plant. OPGC has also not stated the actual improvement in PLF of the plant after R&M. Therefore, after completion of R&M works, specific norms for operation of the power plant should be finalized and applicable for the entire period of 15 years after June, 2026. He has suggested that the secondary fuel oil consumption may be pegged at 0.25 ml per kWh and the PLF of 90% may be considered after R&M.

34. Shri Mahapatra has further submitted that OPGC has estimated the cost of Rs. 549.48 Cr. for installation of FGD only for its 2x210 MW generating units which works out to Rs.1.31 Cr. per MW. On the other hand the cost estimate for installation of FGD for 4x210 MW units of KhSTPS-I is Rs.519.97 Cr. i.e. Rs.0.62 Cr. per MW. As per CEA norms the installation cost of FGD is Rs.0.45 Cr. per MW for 210 MW units. OPGC has submitted that in KhSTPS-I, a common FGD plant has been installed for 2 nos. of units. Shri Mahapatra has stated that for OPGC Units-I & II, a common FGD plant may be installed to avoid unnecessary expenditure as it will utilized for a period of only 15 years and not 25 years. The Commission may direct OPGC to install a common FGD system for both the 210 MW units of Stage-I. Further, OPGC has initiated action for installation of environmental retrofit since 2017, but it is not finalized till date. Therefore, in case there is a delay in commissioning of the same beyond 31.12.2023, the penalty, if any, has to be borne by OPGC and should not be loaded on the consumer tariff.

35. Shri Mahapatra has submitted that OPGC has proposed for Rs.140 Cr. towards construction of one additional ash pond. There should not be any provision in R&M works for construction of additional ash pond. OPGC should improve its performance towards utilization of ash including despatch through railway rakes. If required, in emergency ash from Units-I &II can be disposed in the existing ash pond of Units-III & IV. Further, OPGC has estimated the tariff of Rs.3.49 per kWh after R&M and environmental retrofit. This tariff is at higher side; hence it may not enable GRIDCO for procurement of power from these units under merit order. Further, in its proposal OPGC has calculated the IDC for a period of two years. OPGC may be directed to prudently schedule the receipt of the materials in two phases so as to reduce the amount of IDC and consequently the tariff.

36. In its rejoinder, replying to the objections of the respondents, OPGC has submitted that its present level of ash utilisation is comparable to other pit head thermal power plants across the country. However, in spite of locational disadvantage of the OPGC plant, so far as the avenues for utilisation of ash is concerned, it is taking all possible measures to improve ash utilization by supplying ash to nearby cement plants, for brick manufacturing, for road construction and low land back filling projects. Also, OPGC has started dispatch of ash through Indian Railway rakes to different parts of country and all efforts are being made to maximize ash utilization. Further, even the station having achieved 100% ash utilization, is having big reserve of ash in their ash ponds as ash utilisation is not a continuous activity which is based on the seasonal and opportunity-based utilisation. Keeping in view of the practical aspects of the power plant operation, the Commission has kept the provision for additional capitalisation towards Ash Pond even for existing generating stations without seeking life extension through R&M. The relevant provision is extracted below for ready reference.

"Regulation 12 (4) The capital expenditure, in respect of existing generating station incurred or projected to be incurred on the following counts ***beyond the original scope****, may be admitted by the Commission, subject to prudence check:*

…………

(e) Deferred works relating to ash pond or ash handling system in addition to the original scope of work, on case to case basis:

Provided also that if any expenditure has been claimed under Renovation and Modernisation (R&M) or repairs and maintenance under O&M expenses, the same shall not be claimed under this Regulation;"

37. In view of the above and for all practical purposes, construction of ash pond commensurating with life extension of 15 years of OPGC-1&2 is a basic requirement and it is an integral part of R & M activity, without which continuous operation of the plant and the benefits accruing out of capital expenditure to be made towards life extension will be at stake.

38. Heard the parties and their written note of submission taken in to record. The Commission observed that the Units-1 & 2 of OPGC thermal power stations having 420 MW (2x 210 MW) capacity have completed their useful life of 26 & 24 years respectively. Further, as per PPA between OPGC and GRIDCO, the term of PPA is ending on June, 2026. Therefore, OPGC has filed the present application for R&M of plant due to deterioration in the performance of the generating units resulting in frequent forced outage, reduced output and decrease in efficiency. OPGC has proposed the

estimated capitalization of Rs.756.84 Cr. towards R&M of these units including IDC & GST. This estimated cost includes Rs.140 Cr. towards construction of a new ash pond. In its application, OPGC has also proposed a capital expenditure of Rs.579.7 Cr. (Rs.549.48 Cr. towards installation of FGD and Rs.30.29 Cr. towards installation of FGC) to meet the environmental norms as per the notification of MoEF & CC, Government of India, which is to be completed by December, 2023. The total estimated capital expenditure of Rs.1336.61 Cr. has been proposed by OPGC for the above works and OPGC has computed the generation tariff of 349 Paise/unit (FC-198 P/U and VC- 151 P/U) after the said capital expenditure in its power plant.

39. The Commission observed that in the BSP order of GRIDCO for the FY 2021-22, the Commission has estimated a surplus of 5792.43 MU considering the tied up capacity of GRIDCO with various generators. Subsequently, the Commission vide its order dated 29.10.2021 passed in Case No. 43 of 2021, has allowed for de-allocation of 346 MW from FSTPS-I & II and KhSTPS-I. Further, GRIDCO has submitted that the TSTPS-I power station of NTPC is being phased out from 2022-23 with a reduction of about 323 MW State share from this power station. GRIDCO is the State Designated Entity to procure power from all sources for State requirement. In the instant case GRIDCO in its submission has stated that as per the LGBR prepared by GRIDCO a shortfall in peak demand is estimated at 1105 MW in FY 2026-27 which may be increased upto 1195 MW in FY 2029-30. Similarly, a shortfall in average demand is estimated at 5 MW in FY 2026-27, but in FY 2029-30 a surplus of 256 MW in average demand is estimated. GRIDCO has further submitted that OPGC being a State generator it is advantageous to GRIDCO to avail full entitlement of power from the extended useful life of 15 years of this power station beyond June, 2026 because this is a STU connected power station, hence, there will be no implication of Central Transmission Charges and losses. GRIDCO has further submitted that the post Capex tariff of these power stations will be reduced as the norms of the OERC Tariff Regulation will be applicable after completion of the R&M works. GRIDCO has also stated that installation of FGD is required for compliance of the new environmental emission control norms which should be implemented by December, 2023. However, OPGC should make reasonable endeavour to reduce the cost of installation of FGD. GRIDCO has also stated that there is anticipated industrial load growth due to upcoming mega industrial projects in Paradeep, Kendrapara and Jagatsinghpur area. OPTCL has envisaged commensurate transmission system planning

for installation of sub-stations at 765/400 KV and 400/220/33 KV level in Paradeep area. GRIDCO in its submission dated 03.11.2021 has also stated as follows:

"That, it is anticipated that, the power from OPGC Units 1 & 2 (2*210 MW) after Renovation and Modernisation work and Installation of FGD shall be available to the State at a reasonable tariff. It is also expected that, with installation of Emission Control System in all thermal power plants and commensurate tariff impact, the power available from the OPGC Units 1 & 2 shall be within the Merit Order Despatch (MOD) for the State consumption."

In view of the above GRIDCO has also prayed the Commission to accord in-principle approval for R&M works of OPGC Units- 1 & 2 and also for installation of FGD.

40. The Commission observed that OPGC is now a State generator and GRIDCO is the State designated entity to procure power from all sources on behalf of DISCOMs for State requirements. As per the submission of GRIDCO there will be a shortfall in peak availability of power from the year 2026 onwards after end of the term of PPA with OPGC. Further, due to non-application of CTU charges and losses availing power from OPGC will be cost effective to GRIDCO. In view of the above, the Commission accords in-principle approval for the R&M works and installation of FGD and FGC in respect of generating Units-1 & 2 of OPGC thermal power station, based on the submission of GRIDCO. However, the Commission is not inclined to approve the proposed capital expenditure of Rs.140 Cr. towards construction of a new ash pond. OPGC should use the existing ash pond and follow the mandate of Govt. of India for 100% ash utilization. GRIDCO should take care that there should not be any redundant capacity charge payable on account of this R&M works. GRIDCO must take adequate precaution while signing fresh PPA with OPGC for the extended period of its life. It must be ensured that OPGC power comes within the merit order after renovation and modernisation including installation of FGD and FGC. GRIDCO should avoid at all cost crowding of PPAs with power stations who are beyond the merit order.

41. The Commission directs OPGC to make all reasonable endeavours to reduce the cost towards implementation of FGD and FGC for compliance of the new environmental emission control norms and involve GRIDCO in bidding and evaluation processes for this work. Further, this work should be completed by the stipulated time in order to avoid any penalty. Any penalty on this account shall not be passed on in the tariff of the OPGC.

GRIDCO should also be informed/updated on the procurement process and work in progress in respect of R&M works. Further, during signing of the fresh PPA, GRIDCO should keep in mind that OERC Generation of Tariff Regulations amended from time to time shall be applicable for procurement of power from OPGC power station and there shall not be any redundant capacity charge on account of the PPA.

42. With the above observations and directions, the case is disposed of.

Sd/-	Sd/-	Sd/-
(G. Mohapatra)	**(S. K. Parhi)**	**(U.N.Behera)**
Member	**Member**	**Chairperson**