

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

**Present: Shri G. Mohapatra, Officiating Chairperson
Shri S. K. Ray Mohapatra, Member**

Case No. 78/2021

OHPC

Vrs.

GRIDCO Ltd.

..... Petitioner

..... Respondent

In the matter of: **Application for approval of Capital Maintenance of Unit 1 & 2 of CHEP, Chiplima and the capital civil works of different power stations of OHPC for the FY 2021-22 as per para 12(1)(g) of the OERC (Terms and Conditions for Determination of Generation Tariff) Regulations,2020 and in compliance to Para 15 of the Order passed in Case No.52 of 2019 by the Commission.**

For Petitioner: Shri A. K. Mohanty, Director (Operation) and Shri D. N. Patra, (GM).

Respondent: Representative of GRIDCO

ORDER

Date of hearing: 17.05.2022

Date of order:13.06.2022

The petitioner-OHPC has filed the present application for approval of capital maintenance of the generating Units 1 & 2 of CHEP, Chiplima (Rs.57.36 Crore) and capital expenditure towards civil works at its different power stations (Rs.224.00 Crore) for the FY 2021-22.

2. OHPC has submitted that the Units 1 & 2 of Chiplima Power House were commissioned in the year 1962 and again brought into service in the year 1998 and 2008 respectively after Renovation & Modernisation (R&M). These units have already served for almost 22 years and 13 years respectively after R&M works and during this period no major maintenance has been carried out. However, due to normal wear and tear of various mechanical components, obsolescence of electrical protection & control systems and non-availability of spares, a major overhauling /capital maintenance is required for smooth operation of these units. As per the decision of OHPC Board in its 159th meeting, the OEM M/s. Voith Hydro India Pvt. was asked for inspection and assessment of the conditions of these units. After inspection, the OEM suggested for carrying out capital maintenance of both the units simultaneously in order to minimise

the cost and overall shut down period. After deliberation on techno-commercial aspect of the work and price negotiation with the OEM, the TCC had recommended to place the order on the OEM at the negotiated price of Rs.57.36 crore (Rs.38.93 crore for supply and Rs.18.43 crore for service) for both the units excluding applicable taxes against the offered price of Rs.65.45 crore. The TCC also suggested for shut down of the units one after another as per schedule and to adhere to the timeline for minimum possible outage of the units for the said work. Accordingly, the period of capital maintenance for each machine will be around 200 days as per the recommendation of OEM. OHPC submitted that if the proposed capital maintenance is not taken up, there may be prolonged forced outage of these units resulting in a huge loss to the State being deprived of availing cheap power from these units.

3. OHPC has submitted that the Commission in its Orders passed in Case No. 65 of 2010 and in Case No. 52 of 2019 on the matter relating to approval of Normative Annual Plant Availability Factor (NAPAF) of Hydro Power Stations under OHPC for the control period 2009-14 (from 01.04.2009 to 31.03.2014) and 20019-24 (from 01.04.2019 to 31.03.2024) respectively had made following observation:

“However, the capacity of the generating units under Renovation and Modernization shall not be considered in installed capacity while computing the plant availability factor. Further, while computing the plant availability, the capacity of the generating units under capital maintenance requiring maintenance period of more than 45 days may also be deducted from installed capacity after due approval of the Commission.”

4. Further, the Commission in its order dated 01.05.2012 in Case No. 5 of 2012 has clarified that, *“a generator should not suffer from non- recovery of capacity charges due to capital maintenance of a generating unit which takes around three months and normally taken in each 3 or 5 Years as per the manufactures guidelines.”*

Further, the Commission while approving the Capital Maintenance proposal of different power stations of OHPC at para-152 of ARR & Tariff Orders for FY 2015-16 has made the following clarifications:

- *OHPC should take up the Capital Maintenance of the generating units which are due for capital maintenance as per the operating manual/manufactures guidelines*
- *Due approval of OHPC Board is required.*
- *The zero date for taking up the capital maintenance of the generating units should be fixed in consultation with SLDC.*

- *The capital maintenance of the generating units shall not be taken during rainy season where there is a possibility of spillage of water from the reservoir.”*
5. OHPC has submitted that regarding the additional capitalisation, Regulation 12(1) (g) of OERC Generation Tariff Regulations, 2020 states as follows:

“Additional Capitalization

Para 12(1): The capital expenditure incurred or projected to be incurred, on the following counts within the original scope of work, after the date of commercial operation and up to the cut-off date may be admitted by the Commission, subject to prudence check:

X X X X X

Para12(1)(g): Any additional works/services, which have become necessary for efficient and successful operation of a generating station but not included in the original capital cost.”

OHPC has stated that the Commission vide its order in Case No. 59 of 2020 has approved the Capital works for Implementation of ERP System at different Power Stations and Corporate office of OHPC basing on the above Regulations. In view of the above OHPC has prayed to the Commission to accord in-principle approval to carry out capital maintenance of Units 1 & 2 of Chiplima Power House at a capital expenditure of approximately Rs.57.36 crore exclusive of applicable taxes. OHPC has further prayed to approve the tentative shut down period of 200 days for each unit and accordingly to compute the PAFM during the shutdown period in line with the earlier orders of the Commission.

6. OHPC has submitted that the power channel from HHEP, Burla to CHEP, Chiplima on its way connects Pond-1, Pond-2, Surplus escape, Head Regulator and Cross Regulator. The power channel was constructed in early sixties and no major maintenance work has been carried since then. At present the power channel including its hydro-mechanical component at surplus escape, head regulator and cross regulator are in heavily distressed condition and need immediate repair. In addition the bank top of the channel from head regulator to Chiplima needs widening, the inspection road along the channel from Burla to Chiplima needs renovation and the stone pitching lining at certain places needs to be replaced with concrete line to avoid further damage. OHPC Board in its 163rd meeting on 25.06.2021 had approved the execution of the work of repair and renovation of the power channel through NBCC at an estimated cost of Rs.153.55 crore (Rs.69.91 crore for RD 0.00 to 16,000 ft and Rs.83.64 crore for RD 30,000 to 83,480 ft), which is inclusive of GST, NBCC charges and contingencies. OHPC has estimated a period of 46 days for each work and propose to take up the work during the normal

shut down period of 46 days each in May/June and November/December of two consecutive years. During this period of shut down the generation of CHEP and HHEP will be Nil. OHPC has submitted that after repair and renovation of power channel, the water carrying capacity of the channel will be improved and the water level at the forebay can be maintained at its highest capacity level. Consequently the generation of Chiplima power house is likely to be increased. Further it will also prevent the high annual maintenance cost of the power channel. OHPC submitted that work order has been issued in favour of M/s NBCC for initiating tendering process of these works. OHPC has prayed the Commission to approve the aforesaid work along with approval of shut down period of 184 days (4x46 days) in two consecutive years in order to compute the PAFM during the period of shut down in line with the earlier order of the Commission.

7. OHPC has further sought approval for construction of 42 nos. of 2 BHK quarters, 24 nos. of 3 BHK quarters, 6 nos. of 4 BHK quarters, a 40 bedded Training Hostel and new water supply system at BHEP, Balimela with the estimated cost as given in the table below:

Sl. No.	Name of the Work	Preliminary estimated cost(inclusive of GST & exclusive of consultancy charges)
i)	Construction of 42 nos. of 2 BHK Qtrs. at BHEP, Balimela	Rs.28.20 Crores
ii)	Construction of 24 nos. of 3 BHK Qtrs. & 06 nos. of 4 BHK Qtrs. at BHEP, Balimela	Rs.14.00 Crores
iii)	Construction of 40 bedded Training Hostel at BHEP, Balimela	Rs.05.00 Crores
iv)	Construction of new Water Supply System at BHEP, Balimela	Rs.06.00 Crores
	Total:	Rs.53.20 Crores

8. OHPC has submitted that the existing 2 BHK and 3 BHK quarters were constructed in the sixties and are in dilapidated condition and not repairable economically. The quarters lack basic infrastructure facility such as water tank, tile flooring, water pipe connections, kitchen platform and the vehicle parking space etc. The present strength of executives (AM to DGM) at Balimela is 55 and total number of 3R quarters is 36, out of which 33 nos. are habitable now. OHPC further submitted that the existing erectors' hostel at Balimela is having total 10 rooms, which are being used for the officials from BHEL, WAPCOS, BSF, AG Audit, Diving teams, special teams from GoI/GoO such as

Dam safety, IB, Vigilance etc. and other Govt. officials (police, health, revenue etc.) and OHPC executives on transfer/tour to Balimela. Sometimes it becomes inadequate to meet the requirement. OHPC further submitted that the existing water supply system to Balimela Colony from valve house is very old and proper water purification is not achieved. Further, it is also not possible to supply adequate water to most of the quarters with this old system. In view of the above, OHPC Board in its 163rd meeting has accorded in-principle approval to take up the above works through M/s NBCC on deposit work basis as stated above.

9. Further, OHPC has sought approval for construction of 12 nos. of D type quarters at RHEP, Rengali and extension of water supply to RHEP Colony at Rengali Dam Site. OHPC has submitted that out of total 9 nos. of C type quarters, 4 nos. are at habitable condition and out of total 39 nos. of D type quarter, 28 nos. are at habitable condition, whereas the present strength of executives at RHEP is 72. OHPC submitted that earlier water supply to RHEP colony was looked after by DoWR which has been discontinued and the existing water supply from bore well is grossly inadequate. The Principal Secretary, DoE has directed to ensure proper drinking water supply in the power house area as the employees are forced to purchase drinking water from outside due to non-availability of adequate drinking water. In view of the above, OHPC Board in its 163rd meeting has approved Rs.4.53 crore (approx.) towards construction of 12 nos. of D type quarters and Rs.6.72 crore (approx.) towards extension of water supply system at RHEP, Rengali which is to be carried out through M/s. NBCC. This estimated cost is inclusive of GST and exclusive of consultancy charges.
10. Further, OHPC has sought in-principle approval for construction of a training hostel at OHPC Training Centre, Bhubaneswar at an approximate cost of Rs.6.00 core (exclusive of GST). OHPC has submitted that earlier they had approached the Commission with the proposal for construction of multi-storied office/commercial complex on the land of OHPC Training Centre, Bhubaneswar, which was not considered and the Commission had opined to submit revised proposal in due course after approval of OHPC Board. Now OHPC Board in its 163rd meeting on 25.06.2021 had decided to modify the earlier proposal and approve to undertake work for construction of Training Hostel at OHPC Training Centre, Bhubaneswar in G+4 floor configuration (as per the approved plan of BDA) by NBCC on deposit work basis with an approximate cost of Rs.6.00 crore. OHPC has stated that the present Training Centre does not have Conference Room,

Reading Rooms, Library, Dormitory etc. for meeting the requirements of the trainees coming from various units. Further, there is no accommodation facility in OHPC Training Centre. It has been proposed to render accommodation facilities to the trainees and the employees of OHPC coming from various units for official activities.

11. OHPC has submitted that the present proposal of Capital Works has become necessary for efficient and successful operation of the generating station of OHPC after the cut-off date and thus, comply with the provisions of OERC Tariff Regulation, 2020 and different Orders passed by the Commission. OHPC submits that the above proposals of Capital Works are to be taken up by different power stations of OHPC from FY 2021-22 onwards in a phased manner. In view of the above, OHPC has prayed the Commission to accord in-principle approval of the proposed capital maintenance of units-1 & 2 of CHEP, Chiplima and the proposal of capital civil works at different OHPC power stations as given in the table below:

Sl. No.	PARTICULARS	Tentative Project Cost (Rs. in Cr.)	Shut down Period of the Generating Units	Remarks
1	Capital Maintenance of Unit-1 of CHEP, Chiplima.	29.4378	200days	PAFM to be computed as per earlier orders of the Commission.
2	Capital Maintenance of Unit-2 of CHEP, Chiplima.	27.9202	200 days	
3	Repair and renovation of power channel from RD 0.00 to RD 16000 ft.	69.91	184days (46 day each in May/June and November/December.)	
4	Repair and renovation of power channel from RD 30000 ft. to RD 83480 ft.	83.64	184days (46 day each in May/June and November/December.)	
5	Construction of 42 nos. of 2BHK Qtrs at BHEP, Balimela	28.20 (approx.)		
6	Construction of 24nos. of 3BHK Qtrs & 06 nos. of 4BHK Qtrs at BHEP, Balimela	14.00 (approx.)		
7	Construction of 40 beded Training Hostel at BHEP, Balimela	5.00 (approx.)		
8	Construction of new Water Supply System at BHEP, Balimela	6.00 (approx.)		
9	Construction of Training Hostel at OHPC Training Center	6.00 (approx.)		
10	Construction of 12nos. of 'D' type quarters at RHEP,	4.53 (approx.)		

Sl. No.	PARTICULARS	Tentative Project Cost (Rs. in Cr.)	Shut down Period of the Generating Units	Remarks
	Rengali Dam site.			
11	Extension of water supply to Rengali Hydro Electric Project Colony, Rengali Dam site.	6.72 (approx.)		

12. The Respondent-GRIDCO has submitted that OHPC has proposed for approval of additional capitalization amounting to Rs.281.358 Crore towards Capital Maintenance of Unit-1& 2 of CHEP, Chiplima and Capital Civil Works of its different Hydro Power Stations as per earlier order of the Commission passed in Case No. 52 of 2019 and as per the provisions of OERC (Terms & Conditions for Determination of Generation Tariff) Regulations, 2020. GRIDCO has stated that Regulation 12 (1) of above Regulations on Additional Capitalisation reads as follows:

“The capital expenditure incurred or projected to be incurred, on the following counts within the original scope of work, after the date of commercial operation and up to the cut-off date may be admitted by the Commission, subject to prudence check”

Further, Regulation 3 (1) (n) of above Regulations, 2020 stipulates Cut-off Date as:

“Cut-off Date” means the last day of the calendar month after thirty six (36) months from the date of commercial operation of the project.”

Further, Regulation 12 (1)(g) of above Regulations, 2020 states that:

“Any additional works/services, which have become necessary for efficient and successful operation of a generating station but not included in the original capital cost.”

13. GRIDCO submitted that in accordance with sub-clause (g), read with Clause (1) of Regulation 12 and Regulation 3 (1) (n) of above Regulations, 2020, there is provision of “any additional works/services, which becomes necessary for efficient and successful operation of a generating station” within the last day of the calendar month after thirty six (36) months from the date of commercial operation of the project. Since the period of 36 months from the date of COD of the aforesaid OHPC Generating Stations has already been over since long time, therefore, Regulation 12 (1) (g) of above Regulations, 2020 is not applicable to the proposed maintenance work for Unit-I & II of Chiplima Generating Station. Further, “any additional works/services, which becomes necessary for efficient and successful operation of a generating station” also does not come under purview of Regulation 12 (2) of OERC Generation Tariff Regulation, 2020, which reads as hereunder:

*“The capital expenditure incurred or projected to be incurred, on the following counts within the original scope of work, **after the cut-off date** may, in its discretion, be admitted by the Commission, subject to prudence check:*

- (a) Liabilities to meet award of arbitration or for compliance of the directions or order of any statutory authority or order or decree of any court of law;*
- (b) Change in law or compliance of any existing law;*
- (c) Deferred works relating to ash pond or ash handling system in the original scope of work;*
- (d) Liability for works executed prior to the cut-off date;*
- (e) Force Majeure events;*
- (f) Liability for works admitted by the Commission after the cut-off date to the extent of discharge of such liabilities by actual payments;*
- (g) Raising of ash dyke as a part of ash disposal system.”*

14. GRIDCO stated that, there is no such provision of ‘Capital Maintenance Work’, ‘Repair and Renovation’ or ‘Capital Civil Works’ in any of the Regulation of OERC Generation Tariff Regulations, 2020, as proposed by OHPC in the present Petition. Therefore, in absence of any provision for the above works in the Regulations; the present application of OHPC is liable for rejection.

15. Without prejudice to the stand that the petition is liable for dismissal at the admission stage, GRIDCO further submitted that Clause 4 (Adjustments on Renovation & Additional Capital Expenditure) of the PPA, executed between GRIDCO & OHPC on 20th November, 2009 inter-alia stipulates as here under;

“4.1.1 The Approved Capital Cost shall be:

- (a) Increased by the cost incurred by OHPC in OHPC’s complying with its obligations pursuant to and in accordance with clause 2.1(e) & also any capital expenditure on case to case basis duly approved by OERC can only be passed through tariff.*

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*4.3 Any expenditure for maintenance, **major overhaul of equipment** to operate & maintain the Power Station during the term of agreement shall be met out of O & M and Insurance charges included in the tariff.*

4.4 Any expenditure on replacement of old assets shall be considered for additional capitalisation after writing off the gross value of the original assets from the original capital cost.”

16. GRIDCO stated that as per above mutually agreed terms and conditions of the said PPA, any major overhaul of the equipment shall be met out of O & M and insurance charges included in the tariff for which there is provision in OERC Generation Tariff Regulations, 2020. As submitted by OHPC the Units-1 & 2 of Chiplima Power House

had undergone need-based Renovation & Modernisation (R&M) work in the year 1998 and 2008 respectively and most of the mechanical components were used after refurbishment. But no supporting documents have been submitted by OHPC on such R&M work including date of completion of work and life extension after R&M etc.. OHPC has also not submitted the copy of operating manual/manufacture's guidelines as provided by the OEM during supply/installation and commissioning of these Units to ascertain whether there is provision for such capital maintenance along with the scope of such work and duration etc. OHPC has not brought out the impact of such investment on tariff, which will be passed on to the consumers ultimately. OHPC has also neither quantified the reduction in O & M expenses nor the increase in generation of electricity after such huge investment.

17. GRIDCO further stated that, the proposal of OHPC to incur huge expenditure of more than Rs.57 Crore for so-called capital maintenance of Units- 1 & 2 of Chiplima is without any life extension of the units. GRIDCO prays that in case the Commission allow such huge expenditure it may be treated as R & M work with life extension for further period of 25 years in addition to the life extension after completion of R & M in 1998 and 2008 for unit 1&2 respectively.
18. GRIDCO has further submitted that, there is no provision in OERC Generation Tariff Regulations, 2020 for the proposed Rs.153.55 Crore towards Repair and Renovation of Power Channel of Chiplima. Such expenditure may be met by OHPC from its O&M cost/own earnings. However, GRIDCO submits that in case the Commission decides to pass on the above cost in generation tariff then:
 - a) OHPC is to guarantee the healthy condition of the power channel for a minimum period of 50 years.
 - b) Saving in annual maintenance cost needs to be quantified by OHPC.
 - c) Increase in generation of electricity also needs quantification.
 - d) OHPC is required to quantify the impact of such huge investment on generation tariff, which will be ultimately passed on to the consumers.
19. GRIDCO has further submitted that there is no provision in OERC Generation Tariff Regulations, 2020 for capitalization of the proposed capital civil works for construction of Quarters, Training Hostel and water supply system etc. OHPC in addition to earning from sale of power inter-alia return on equity have also other sources of earnings like

interest from fixed deposit etc. So, GRIDCO is of the view that the proposed capital civil work amounting to Rs.70.45 Cr. which includes construction of Qtrs. at Balimela & Rengali, construction of Training Hostel at OHPC Training Center, Bhubaneswar & construction of water supply system at Balimela and Rengali etc. may be met out from miscellaneous earnings of OHPC i.e. from its own investment to avoid further tariff burden on the consumers of the State. The proposed civil constructions, which are not incidental to the hydro generation may not be allowed and passed on to the tariff.

20. In its reply to the objections raised by GRIDCO, the petitioner-OHPC in its rejoinder has submitted that they have filed the proposal for taking up Capital Works as per the existing Regulations, agreed PPA and previous Orders of the Commission. The relevant provisions are summarized below:

(i) **Clause No. 12(3) of OERC(Terms & Conditions for Determination of Generation Tariff) Regulations, 2020 :**

“In case of replacement of assets deployed under the original scope of the existing project after cut-off date, the additional capitalization may be admitted by the Commission, after making necessary adjustments in the gross fixed assets and the cumulative depreciation, subject to prudence check on the following grounds:

- (a) *The useful life of the assets is not commensurate with the useful life of the project and such assets have been fully depreciated in accordance with the provisions of these regulations;*
- (b) *The replacement of the asset or equipment is necessary on account of change in law or Force Majeure conditions;*
- (c) *The replacement of such asset or equipment is necessary on account of Obsolescence of technology; and*
- (d) *The replacement of such asset or equipment has otherwise been allowed by the Commission.*

ii) **Relevant portion of Approved PPA:**

4.1.1 The Approved Capital Cost shall be:

- (a) *Increased by the cost incurred by OHPC in OHPC's complying with its obligations pursuant to and in accordance with clause 2.1(e) & also any additional capital expenditure on case to case basis duly approved by OERC can only be passed through tariff.*

iii) **Relevant portion of Order dtd. 11.06.2020 in Case No. 56 of 2019:**

Para-21: From conjoint reading of the above provisions, we find that additional capitalization can be permitted for renovation and modernization work after prudence check by the Commission. OHPC is to take up the capital maintenance of generating units as per the operating manual/manufactures guidelines since the units are in operation for a very long period. The following units are

approved to be taken up under capital maintenance as proposed by OHPC. This will extend the life of the generating units.”

iv) Relevant portion of Order dtd. 01.05.2012 in Case No. 05 of 2012:

“a generator should not suffer from non-recovery of capacity charges due to capital maintenance of a generating unit which takes around three months and normally taken in each 3 or 5 Years as per the manufactures guidelines.”

21. OHPC stated that as per the above provisions, they are taking up the need based Capital Maintenance of its Power Stations basing on the manufacturer’s guideline after due approval of the Commission. Accordingly, OHPC has filed the present petition for approval of different Capital Works by the Commission. Periodic capital maintenance is required on regular basis to increase the availability & reliability of machines. However, due to exigency of work & to avoid immediate outage of machine, OHPC sought the assistance of the OEM, M/s. Voith Hydro Pvt. Ltd and based on the OEM’s recommendation after site inspection, OHPC has issued the work order for execution of Capital Maintenance of work of Unit-1 & 2 of CHEP, Chiplima. The major maintenance work to be taken in this Capital Maintenance as per work order are as follows:

- i) Replacement of generator brake assembly.
- ii) Replacement of generator lubrication system
- iii) Replacement of Turbine Guide bearing.
- iv) Replacement of shaft seal assembly.
- v) Replacement of drainage & dewatering system.
- vi) Replacement of cooling water system.
- vii) Replacement of OPU governing system.
- viii) Replacement of digital governing panels & cabling.
- ix) Replacement of control system panels & cabling.
- x) Replacement of protection system panels & cabling.
- xi) Replacement of Unit Auxiliary Board.
- xii) Replacement of current transformer at generator phase & neutral side.

22. OHPC has submitted that as per the above scope of work there is no replacement of major components viz: Turbine, Generator & Transformer, which may be done during R&M programme at a later date, after conducting Residual Life Assessment (RLA) study. However, the present capital maintenance work would be taken up for replacement auxiliary equipment / systems associated with Generator –Turbine set as per recommendation of OEM. The availability of spares of such auxiliary systems have

become difficult due to technological obsolescence. The present capital maintenance work will increase the reliability and availability of machines for another 10 years or so and reduce the outage hours. Thereby GRIDCO can source the cheap hydro generation from these units. Since the present requirement of Capital works is well accommodated under the above mentioned regulatory provisions, GRIDCO's objection for non-admissibility of the petition in absence any regulations is not correct.

23. OHPC has stated that the purpose of Capital Maintenance and Renovation & Modernization works are different from each other and therefore, has been addressed separately. Accordingly, whether a particular generating unit requires R&M or Capital Maintenance are determined and decided in consultation with the OEM, as they are authorized for such recommendation. Since the generating units have not yet completed their useful life after their 1st phase R&M works, it may be further considered for the proposed Capital Works for healthy and smooth running of another 10 years. OHPC has submitted a comparative study of Units undergoing Renovation & Modernization and Capital Maintenance as given in the table below:

Sl. No.	Particulars	Unit undergoing R&M	Unit undergoing Capital Maintenance
1	Capital Required	Rs70Crs per Unit (approx.)	Rs.28 Crs per Unit (approx.)
2	Rise in average cost of CHEP	10.55 paise per Unit	4.22 paise per Unit
3	Tentative period of Shutdown	24 months (more time is required for Tendering, dismantling of Unit, Approval of drawing & design, Reverse engineering, transportation of critical parts from abroad etc)	6 months (less as few part are to be replaced)
4	Depreciation	Depreciation fully recovered	Depreciation partly recovered
5	Life Extension	Life is extended as provided by the OEM and approved by OERC	<ul style="list-style-type: none"> • Reliability & availability of machine is increased for an approximate period of 10 years. • The outage of the machine is reduced thereby increasing availability of machines. • Breakdown of auxiliary systems & subsequent machine outage are avoided.
6	Loss of water	Since outage period is more there is continuous loss of water.	Less water is lost in spillway or auto siphon.
7	Technology Upgradation	One time Technology Upgradation is possible only at the time of R&M.	Reliability & Efficiency is maintained due to intermittent technology upgradation during Capital Maintenance

8	Spare Management	Spare management is smooth for initial year till upgradation of technology.	Spare management is always easy as technology is upgraded timely.
9	Outage Hour	Outage hour increases after 10 to 15 years due to wear and tear of movable parts	Timely Capital Maintenance brings down the outage hour.
10	Recommendation	R&M is recommended after RL&A study of Unit.	Capital Maintenance is recommended as per OEM guidelines.

OHPC has stated that from the above analysis it shall be wise and cost effective to take Capital Maintenance of Unit I & II of CHEP at this stage to increase the reliability & maintain efficiency of these units for a longer period.

24. OHPC has further submitted that the power channel including its Hydro- Mechanical components at surplus escape, head regulator & cross regulator are in heavily distressed and damaged condition causing widespread water loss due to seepage and hence the following repairs are urgently required to maintain the healthy condition of the power channel for years to come.

- i) The repair of the linings at different locations of power is urgently required to restrict further damage and further breach of the power Channel. As understood from project authorities, the bed repair of the power Channel is also urgently required as per the site conditions and requirements.
- ii) The bank top of the channel from head regulator to CHEP to be increased suitably for providing additional safety and also to prevent overtopping.
- iii) The inspection road along the channel from HHEP to CHEP to be renovated with CC pavements for better longevity and ease in inspection & communication.
- iv) Keeping in view the alarming condition of the bed etc., the repair of entire power channel from HHEP to be taken up which will help in keeping the power channel in healthy condition for another 50 years and more.
- v) The stone pitching lining wherever present are to be replaced with concrete lining to avoid further damage and frequent repair.
- vi) The head regulator, cross regulator and other mechanical components are to be repaired and renovated as per the standard practice.

OHPC has stated that the above works shall be undertaken through M/s NBCC Ltd. on deposit work basis and appropriate care shall be taken to ensure the quality so as to maintain a healthy condition of the power channel for another minimum 50 years. The repair of concrete lining and bed concrete of the entire power channel has been envisaged with state-of-art technology. Further the present proposal also includes installation of sewage treatment plant at requisite locations in order to prevent entry of organic waste to power channel that is contributing to weed growth. This will save the expenditure of OHPC in cutting, clearing and disposal of aquatic weeds during regular powerhouse shutdown period. Further, cost incurred by OHPC in frequent repair & maintenance of power channel is amounting to Rs.25.00 lakhs (approx.)/ annum which will be saved after completion of the proposed work. In addition the following major saving and advantages of the work are:

- The water carrying capacity of the power channel will be improved resulting in increase in generation which is a major benefit of this work.
- There will be no need for shutdown of the generating unit during May/June and Nov/Dec each year during repair and maintenance work of power channel.

25. In view of the above, OHPC has prayed the Commission to approve the repair and renovation of the power channel from HHEP, Burla to CHEP, Chiplima at an estimated cost of Rs.153.55 Cr (Rs.69.91Cr from RD 0.00 to 16000 ft and Rs.83.54 Crs from RD 30000 to 83480 ft) along with approval of the shutdown period of 184 days in order to compute the PAFM during the approved period of shutdown in line with the earlier orders of the Commission mentioned in earlier paragraphs.

26. OHPC has further submitted that –

- (a) In case the proposed capital maintenance of units of CHEP is not taken up, there may be prolonged forced outage of the Units and as a result state of Odisha shall be deprived of availing cheap power @ 74.02 p/unit (for FY 2021-22) and peaking support to the State Grid. In addition CHEP will lose Rs.1,63,927 per machine per day on account of capacity charge besides loss of energy charges.
- (b) The impact of capitalization of Rs.57.358 Crs will increase the first year average tariff of CHEP by about 8.69 p/unit and average tariff of OHPC will increase marginally by about 0.75 p/unit. The above impact is calculated considering repayment period of loan for 10 years and approved norms of the Commission.

- (c) The impact of capitalization of Repair and Maintenance of Power Channel from RD 0.00 to RD 16000 at the cost of Rs.69.91 Crore will increase the 1st year average tariff of CHEP by about 10.59 p/unit and average tariff of OHPC will increase marginally by about 0.91 p/unit. Similarly, the impact of capitalization of Repair & Maintenance of Power Channel from RD 30000 to RD 83480 at the cost of Rs.83.64 Crore will further increase the 1st year average tariff of CHEP by about 12.68 p/unit and average tariff of OHPC marginally by about 1.10 p/unit. The above impact is calculated considering repayment period of loan for 10 years and approved norms of the Commission. This may further reduce if the loan repayment period is considered for 12 years or 15 years.
- (d) The Unit 1&2 of CHEP may generate upto 350 MU.
- (e) There will be no considerable change in O&M expenditure as regular daily, quarterly and annual maintenance are required for up keeping of the machines as per manufacturer's guide lines and 70% of the approved O&M expenditure goes towards manpower expenditure.

27. Heard the Petitioner and the Respondents on virtual mode. OHPC has sought approval for execution of the following works and capitalisation of the cost thereof which are discussed below:

- (a) Capital maintenance of Units 1 & 2 of Chiplima Power House.

The Units-1&2 of CHEP, Chiplima had undergone R&M works in the year 1998 and 2008 respectively. As per the submission of OHPC, during the above need based R&M works most of the mechanical components were used after refurbishment. Moreover, the protection and control system have now become obsolete and availability of spares have become difficult. Further, OHPC has not carried out capital maintenance of these units after the above R&M works. Therefore, OHPC has proposed for capital maintenance of these generating units with an estimated cost of Rs.57.36 Crore excluding applicable taxes (Unit-1 Rs.29.4378 Crore and Unit-2 Rs.27.9202 Crore) with the maintenance period of 200 days for each unit. The TCC has recommended to place the order on the OEM at the above negotiated price.

The Commission further observed that the capital maintenance of the generating units are normally undertaken with an interval of 3 to 5 years as per the

manufacture's guidelines for smooth and efficient running of the generating units. Chiplima power house is a base load power plant which runs with the tail race water from Burla power house available through the power channel. Hence, the generating units of the Chiplima power house must be ready for operation to avoid wastage of water after generation at Burla. We observe that Clause 12 (3) of OERC (Terms & Conditions for Determination of Generation Tariff) Regulations 2020 and Clause 2.1 (e) of PPA provides for additional capitalization for such capital maintenance. Further, the Commission vide its earlier orders in Case No. 56 of 2009 and Case No. 5 of 2012 have allowed for such capital maintenance to OHPC even after the cut-off date. In view of the above, the Commission now accord in principle approval to carry out the capital maintenance of Units-1&2 of Chiplima power house at the negotiated price of Rs.57.36 Crore as proposed by OHPC since this capital maintenance is based on the recommendation of the OEM. As prayed for by OHPC, during the proposed period of the above capital maintenance, the PAFM of Chiplima power House shall be computed as per the Commission's order in Case No. 52/2019 and beyond the proposed period the PAFM shall be computed as per the Generation Tariff Regulations. However, OHPC should take care that there would not be any cost and time over-run while carrying out the proposed capital maintenance. Efforts should be made to minimize the shut down period of machines by reducing the time period for site activity.

- (b) Repair and renovation of power channel from Burla Power House to Chiplima Power House.

OHPC has proposed for repair and renovation of power channel from Burla Power House to Chiplima Power House including its hydro mechanical components at surplus escape head regulator and cross regulator through NBCC at an estimated cost of Rs.153.55 Crore (Rs.69.91 crore for RD 0.00 to 16,000 ft and Rs.83.64 crore for RD 30,000 to 83,480 ft) inclusive of GST, NBCC charges and contingencies. OHPC has proposed to take up the work during the normal shut down period of 46 days each in May/June and November/December of two consecutive years. Total shutdown period shall be 184 days (4 x 46 days) in two consecutive years. The Commission feels that Repair and Maintenance of Power Channel from HHEP to CHEP is essential so that its water carrying

capacity is not affected and optimum generation is possible at Chiplima Power House. As per submission of OHPC in this regard the work order has been issued to NBCC who shall carry out this work on deposit work basis following tendering process.

The Commission agrees in principle with this proposal of OHPC for refurbishment of power channel. The estimated cost of Rs.153.55 Crore for this work will have impact on tariff of consumers. Hence, OHPC must ensure that cost of executed work is optimised and tender for this work is carried out in a transparent manner by NBCC with details specification having stringent norms and technical parameters. The representative of OHPC shall participate in the tender evaluation process. The actual cost discovered through this tendering process shall be allowed for capitalisation once the work is over. OHPC shall approach the Commission for actual capitalisation of this work in its future tariff petition after such work is completed.

(c) Other Civil Works

- i. Construction Quarters at BHEP, Balimela and RHEP, Rengali.
- ii. Construction of new water supply system at BHEP, Balimela and extension of water supply system to RHEP colony at Rengali Dam site.
- iii. Construction of 40 bedded Training Hostel at BHEP, Balimela.
- iv. Construction of Training Hostel at OHPC Training Centre at Bhubaneswar.

OHPC has proposed for approval of a total estimated amount of Rs.70.45 crore for other civil works as mentioned above and to undertake the civil works through M/s. NBCC Ltd. on deposit work basis. OHPC proposes for construction of 42 nos. of 2 BHK, 24 nos. of 3 BHK and 6 nos. 4 BHK quarters at BHEP, Balimela at an estimated cost of Rs.47.20 Crore and construction of 12 nos. of D type quarters at RHEP, Rengali at an estimated cost of Rs.4.53 crore.

OHPC has further proposed for construction of new water supply system at BHEP, Balimela at an estimated cost of Rs.6.00 Crore and for extension of water supply system to RHEP colony at Rengali Dam site at an estimated cost of Rs.6.72 Crore. OHPC has further proposed for construction of a 40 bedded Training Hostel at BHEP, Balimela at an estimated cost of Rs.5.00 Crore and

construction of Training Hostel at OHPC Training Centre at Bhubaneswar at an estimated cost of Rs. 6.00 Crore.

The Commission feels that there is need for construction of quarters along with other basic facilities like drinking water supply system at BHEP & RHEP, which were constructed during the years 1960s & 1980s respectively, to provide better living condition to employees staying in such remote areas. Similarly, proposed construction of training hostel at Balimela and Bhubaneswar is also considered essential for capacity building of employees. Therefore, the Commission agrees for construction of the proposed civil works in respect of construction of quarters & water supply system at BHEP & RHEP, construction of Training Hostel at OHPC Training Centre, Bhubaneswar. However, the Commission observed that the expenditure on the above civil works, if passed on in the ARR of OHPC, will cause hike in OHPC Tariff which consequently exerts burden on the State consumers. In order to avoid such burden on the consumers, the Commission is not inclined to pass on the expenditure of Rs.70.45 Crore proposed by OHPC for the above mentioned civil works as OHPC is in a comfortable position to meet such expenses from its earnings for which huge amount of income tax is being paid by it. Hence, the Commission suggests that OHPC may meet the said expenditure from its miscellaneous earnings in a segregated manner spanning over some years and should not be capitalised.

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

Sd/-
(S. K. Ray Mohapatra)
Member

Sd/-
(G. Mohapatra)
Officiating Chairperson