

MINUTES OF THE 17TH MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 27TH SEPTEMBER, 2021 FROM 10:30 AM – 12:30 PM THROUGH VIDEO CONFERENCE.

The 17th meeting of the re-constituted EAC for River Valley & Hydroelectric Projects was held on 27th September, 2021 in the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, through video conference, under the Chairmanship of Dr. N. Lakshman. The list of Members participated in the meeting is at **Annexure**.

Agenda No. 17.1

CONFIRMATION OF THE MINUTES OF 16TH EAC MEETING

The minutes of the 16th EAC (River Valley Hydroelectric Project) meeting held on 7th September, 2021 were confirmed.

Agenda No. 17.2

Chitravati Pumped Storage Hydroelectric Project (500MW) in an area of 136 ha located at village Peddakotla and Parnapalli, Tehsil Tadimarri, District Anantapuram, Andhra Pradesh by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd. (NREDCAP) – Terms of Reference - reg.

[Proposal No. IA/AP/RIV/227012/2021; F. No. J-12011/12/2021-IA.I (R)]

17.2.1 The proposal is for grant of Terms of Reference (ToR) to Chitravati Pumped Storage Hydroelectric Project (500MW) in an area of 136 ha located at village Peddakotla and Parnapalli, Tehsil Tadimarri, District Anantapuram, Andhra Pradesh by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd. (NREDCAP).

17.2.2 The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

- i. The proposed project is pumped storage at Chitravathi Balancing Reservoir comprising of 500 MW / 2805 MWH storage capacity, located at Ananthapuramu District, Andhra Pradesh. The Chitravathi Pumped Storage Project will comprise of two reservoirs.
- ii. The geographical coordinates of the proposed upper reservoir are at longitude 77°56'2.6"E & latitude is 14°34'26.93"N and that of existing lower reservoir are at 77°56'51"E and 14°33' 31"N. Sri Penchikala Basi Reddy Chitravathi Balancing Reservoir is constructed across Chitravathi River near Parnapalli village of Lingala Mandal of YSR Kadapa District with a

storage capacity of 10.00TMC. The project lies in border of YSR Kadapa and Ananthapuramu districts. The Chitravathi dam is in YSR Kadapa District and the reservoir is in Ananthapuramu District. The new upper reservoir is proposed on the left bank of Chitravathi Dam, near Peddakotla village.

- iii. The existing Chitravathi Balancing Reservoir has been proposed as lower reservoir for the Pumped storage scheme with Full Reservoir Level of 298 m and Minimum draw down level of 282.55m. An artificial reservoir is proposed as upper reservoir which is constructed by excavating a pit and forming partial embankment/bund at elevation 495.0m.
- iv. Gross Storage Capacity of Existing Reservoir is 283.1 MCM (10 TMC). The live storage capacity for pumped storage scheme required is 6.26 MCM (0.22 TMC) i.e. 2.2% of storage capacity of existing lower reservoir. The proposed project will generate 500 MW of power by utilizing net rated head of 189.40 m. The total catchment area of the existing Chitravathi Balancing Reservoir is 5431 Sq. Km and the design flood discharge is 4080 Cumec.
- v. The water from the upper reservoir will be diverted through Power House and TRT to the existing lower reservoir. The water will be pumped back to the upper reservoir through TRT-Reversible Turbines-pressure shaft-HRT to upper reservoir. Evaporation losses, if any will be recouped periodically. The Project envisages non-consumptive re-utilization of 0.22 TMC of water for recirculation among these two reservoirs.
- vi. The Chitravathi PSP a storage capacity of 2805 MWH with Rating of 500 MW. This Project comprises of 2 units of 250 MW each. The Project will generate 500 MW by utilizing a design discharge of 297.26 cumec with rated head of 189.4 m. The Chitravathi PSP will utilize 556 MW to pump 0.22 TMC of water to the upper reservoir in 6.49 hours.
- vii. **Salient features of the Project:**

1. LOCATION	
Country	India
State	Andhra Pradesh
District	Anantapur/ Kadapa
River	Chitravathi river a tributary of Pennar River
Upper Reservoir	N- 14° 34' 26.93" E- 77° 56' 2.60"
Chitravathi Reservoir (Lower Reservoir)	N14° 34' and Long. E77° 57' 31.09"
Access to the Project	
Road	Accessible from State Highway SH 121
Airport	Tirupati: 260 km
Railhead (with unloading facilities)	Chinnekunta Palli : 30 km
Port	Krishnapatnam : 280 km

2. PROJECT	
Type	Pumped Storage Project
Installed Capacity	500 MW
Peak Operating duration	5.61 Hr.
3.0 CIVIL STRUCTURE	
3.1 UPPER RESERVOIR (New) (Excavated Pit)	
FRL	EL. 495 m
MDDL	EL. 460 m
Bed Level of Reservoir	EL. 459 m
Available Live storage	0.22 TMC (6.26 MCM)
3.2 LOWER RESERVOIR (Existing)	
FRL	EL. 298 m
MDDL	EL. 282.55 m
Live storage	9.956 TMC (281.85 MCM)
Dead Storage	0.044 TMC (1.25 MCM)
3.3 Upper Intake Structure	
Type	Bank Tower Type Intake
Size of Intake	5 bays of 4.5 width each
Sill Level of Intake	EL. 437 m
3.4.1 Main Pressure Shaft Tunnel (Steel Lined)	
Diameter	7.7 m
Length	312 m.
No. of Tunnel	1
3.4.2 Branch Pressure Shaft Tunnel (Steel Lined)	
Diameter	7.5 m
Length	62 m each.
No. of Tunnel	2
3.4 Tailrace Tunnel (Concrete Lined)	
Shape	Circular
Length	300.6 m
Diameter	10.7 m
3.5 Outlet Structural Lower Intake/Pump Intake	
Type	Trapezoidal type with anti-vortex louver
Size of Intake	6 bays of 5.7 width each
Sill Level of Intake	EL. 263 m
3.6 Powerhouse	
Type	Underground,
Size	105mx23.5mx5 1.5m
3.7 Transformer Room including Secondary GIS	
Type	Underground
LxWx H	90 mX18.5 mX30.0 m
3.8 Main Access Tunnel (MAT)	

Type	D-shape	
Size	8 m dia.	
3.8 Cable Access Tunnel (CAT)		
Type	D—shape	
Size	6 m dia.	
4.0 Electromechanical Equipment		
4.1 Pump Turbine		
Type	Vertical axis reversible Francis Turbine	
Number of unit	2 (Two)	
Max. Head as Turbine	206.22 m	
Rated Turbine Head	189.40 m	
Min. Head as Turbine	155.77 m	
Turbine Output at Rated Head	250 MW	
Max. Head as Pump	218.68 m	
Rated Pump Head	200.54 m	
Min. Head as Pump	168.23 m	
Max. discharge of Turbine at rated Turbine head	148.63 Cumec	
Turbine Centre Line	EL 245.45 m	
Rated Speed	214.30 rpm	
4.2 Generator-Motor		
Type	3 phase AC Synchronous Generator - Motor, Semi Umbrella Type	
Number of unit	2	
Motor Generator Capacity	327 MWVA	
Rated Voltage	15 kV	
Rated Frequency	50 cycles per second	
Synchronous Speed	214.30 rpm	
4.3 Transmission Line		
Type	Double Circuit moose Conductor	
Capacity Voltage Level	400 kV	
Length	Talaricheruvu - 45 KM (Approx.)	
4.4 Project Cost		
Item	Estimated Cost (INR-Cr)	
Civil and HM Works	989.49	
Electro-mechanical Works	808.10	
IDC	230.13	
Total	2027.72	
4.5 Project Benefit's		
Off Peak Energy Rate (INR/kWh)	First Year Tariff (INR/kWh)	Levellised Tariff(INR/k Wh)
3	8.37	7.82
2.5	7.70	7.15
2.0	7.03	6.48
0.0	4.36	3.81

- viii. The Chitravathi is an inter-state river in southern India that is a tributary of the Pennar River. Rising in Karnataka, it flows into Andhra Pradesh and its basin covers an area of over 5,900 km².
- ix. Considering the time for reserves for morning demand, it is proposed to operate on a daily cycle basis with 5.61 hours of peaking generation during 6 PM to 10PM.
- x. Total land required for the construction of proposed activities is approximately 136 ha. There is no settlement in the entire project area. No interstate issue on sharing of water, construction of new project, benefits and cost is involved.
- xi. **Details on Submergence Area:** The Proposed scheme is categorized as Open loop Pump Storage type. The Lower reservoir is an existing reservoir namely Chitravathi Balancing Reservoir which is connected to natural Chitravathi river. The Upper reservoir is proposed as an artificial reservoir at higher elevation to gain the available head. The area required for the upper reservoir is approx. 51 hectares.
- xii. **Details on Ecological Sensitive Area:** The proposed project does not involve diversion of any forest land or any National park/ Wildlife Sanctuary/ Conservation reserve etc., nor falls within 10 km boundary of any Protected Area under Wildlife Protection Act 1972. Accordingly, the project does not require CRZ clearance/ Forest clearance/ Wildlife Clearance.
- xiii. The total estimated cost of the project including direct and indirect charges including IDC is worked out to be Rs.202772 Lakhs (2027.72 Crores) and the cost per MW of installed capacity works out to be Rs. 4.05 Crores.
- xiv. **R&R details:** No rehabilitation is required for the proposed project. As per the revenue survey map, the proposed site has been classified as 'waste land'.

17.2.3 The EAC during deliberations noted the following:

EAC in the present meeting (17th meeting) deliberated on the information submitted (Form 1, PFR, etc.) and noted that 136 ha waste land will be required for the various components of the proposed PSP in which no forest land exists. EAC further noted that No Ecological Sensitive Area, if any within 10 km of Project site (WLS/Tiger/elephant corridor/Critically polluted area etc.).

The Project will generate 500 MW by utilizing a design discharge of 297.26 cumec with rated head of 189.4 m. Solar power will be utilized for lifting the water from lower reservoir to upper reservoir which will utilize 556 MW to pump 0.22 TMC of water to the upper reservoir in 6.49 hours.

17.2.4 *The EAC after detailed deliberation on the information submitted and as presented during the meeting **recommended** for grant of Standard ToR to Chitravati Pumped Storage Hydroelectric Project (500MW) in an area of 136 ha located at village Peddakotla and Parnapalli, Tehsil Tadimarri, District Anantapuram, Andhra Pradesh by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd. (NREDCAP), under the provisions of EIA Notification, 2006 and its amendments therein along with the following additional/specific ToR:*

- i. Certificate from concerned Forest department shall be submitted certifying that land acquired for the project is wasted land and no Forest land is involved for project purpose.*
- ii. Certificate from Chief Wildlife Wardern shall be submitted mentioning that project area not falling in any Ecological Sensitive Area, WLS/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.*
- iii. Three season (Pre-monsoon, Monsoon and winter season) baseline data of all the environmental attributes including biological environment as mentioned in the Standard ToR shall be collected for preparation of EIA/EMP report. Soil characteristics shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.*
- iv. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) and accordingly a detailed Water Shed development Plan shall be prepared and incorporated in EIA/EMP report.*
- v. The PP shall explore the possibility of fulfilling the entire power requirement to pump the water from the lower reservoir to the proposed upper reservoir from renewable sources except under exceptional unforeseen situations.*
- vi. The PP will submit undertaking that no additional waters will be withdrawn from Chitravathi River or any other water resource and will use only the water available in lower reservoir.*
- vii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.*
- viii. Fisheries Management Plan be prepared along with other Environmental Safety Measures and shall be incorporated in the EIA/EMP report.*

- ix. *Declaration by the project proponent by way of affidavit that “No” Inter-state issue is involved with any state in the project.*
- x. *All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/EMP report in the relevant chapter. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry’s OM F.No.22-65/2017-IA.III dated 30th September, 2020 shall be submitted.*
- xi. *Consolidated EIA/EMP report to be submitted as per the generic structure (Appendix III & IIIA) given in the EIA Notification, 2006.*
- xii. *Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.*
- xiii. *Techno-economic viability of the project must be recommended from CEA/CWC.*
- xiv. *Environmental matrix during construction and operational phase needs to be submitted.*
- xv. *Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used may be mentioned in the EIA report.*
- xvi. *Both capital and recurring expenditure under EMP shall be submitted.*
- xvii. *Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.*
- xviii. *Environmental Cost Benefit Analysis shall be done in terms of water availability, water uses for generation of hydro power and Ecological flows in the Pennar River & Chitravati River.*
- xix. *Submit NOC from Government of Karnataka for Use of water from reservoir of Chitravati River for lifting the water for generation of Hydropower.*
- xx. *Undertaking regarding water allocated to this scheme shall not be diverted to other purpose such as lift irrigation scheme etc.*
- xxi. *Photograph of sampling location shall contain specific date and time along with coordinates which shall be incorporated in EIA.*
- xxii. *An undertaking as part of the EIA report from Project proponent, owning the contents (information and data) of the EIA report with the declaration about the contents of the EIA report pertaining to a project have not been copied from other EIA reports.*

The meeting ended with vote of thanks to the Chair.

ATTENDANCE LIST

Sr. No.	Name & Address	Role	Attendance
1	Dr. N. Lakshman	Member (Acting Chairman)	P
2	Dr. Mukesh Sharma	Member	P
3	Dr. A. K. Malhotra	Member	P
4	Shri Sharvan Kumar	Member (Representative of CEA)	P
5	Dr. A. K. Sahoo	Representative of CIFRI	P
6	Shri Yogendra Pal Singh	Member Secretary	P

APPROVAL OF THE CHAIRMAN

Email

<https://email.gov.in/h/printmessage?id=58716&tz=Asia/Kolkata&xim=1>

Email

Yogendra Pal Singh

Re: Draft MoM of 17th EAC meeting held on 29.07.2021

From : lnand@rocketmail.com

Fri, Oct 01, 2021 04:21 PM

Subject : Re: Draft MoM of 17th EAC meeting held on 29.07.2021

To : Yogendra Pal Singh <yogendra78@nic.in>, mukesh@iitk.ac.in

Cc : jaj@wii.gov.in, ajitkumarmalhotra463@gmail.com, amiya saho <amiya.sahoo@icar.gov.in>, amiya7@gmail.com, Amrendra Kumar Singh <ceenvtmgmt@nic.in>, bijayaketan panigrahi <bijayaketan.panigrahi@gmail.com>, balrajjoshi@gmail.com, chandrahas deshpane <chandrahas.deshpane@welingkar.org>, dchandrahas@gmail.com, kn shenoy <kn.shenoy@manipal.edu>, udaykumarry@yahoo.com, director@mnit.ac.in, Dr. Vijay Kumar <vijay.kumar66@nic.in>, dirhpa3@gmail.com, Munna Kumar Shah <munna.shah@gov.in>, Sourabh Kumar <sourabh.9@govcontractor.in>

Reply To : Lakshman Nandagiri <lnand@rocketmail.com>

Dear Yogendraji,
I extend approval to the Minutes.
-Lakshman
...

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"In the play of life, wisdom usually appears after the final act"

On Friday, October 1, 2021, 11:44:54 AM GMT+5:30, <mukesh@iitk.ac.in> wrote:

1 of 2

04-10-2021, 12:42