# MINUTES OF THE $38^{TH}$ MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON $15^{TH}$ DECEMBER, 2022 FROM 02:30 PM – 05:30 PM THROUGH VIDEO CONFERENCE.

The 38<sup>th</sup> meeting of the re-constituted EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 15<sup>th</sup> December, 2022 through video conference, under the Chairmanship of Dr. A. K. Malhotra. The list of Members present in the meeting is at <u>Annexure</u>.

### Agenda Item No. 38.1

Confirmation of the minutes of 36<sup>th</sup> EAC meeting.

### Agenda Item No. 38.2

Singanamala Pumped Storage Project (800 MW), in an area of 480.65 Ha located at Salakam cheruvu Village, Tehsil Singanamala, District Ananthapuramu, (Andhra Pradesh) by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd (NREDCAP) Project – Terms of Reference (TOR) – reg.

#### [Proposal No. IA/AP/RIV/407154/2022; F. No. J-12011/18/2022-IA.I (R)]

**38.2.1:** The proposal is for grant of terms of reference to Singanamala Pumped Storage Project of capacity 800 MW in an area of 480.65 Ha located at village Salakam cheruvu, Tehsil Singanamala, District Ananthapuramu (Andhra Pradesh) by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd (NREDCAP).

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

The proposal is for grant of Terms of References (TOR) to Singanamala Pumped Storage Project (800 MW), in an area of 480.65 Ha located at Salakam cheruvu Village, Tehsil Singanamala, District Ananthapuramu, (Andhra Pradesh) by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd (NREDCAP) Project.

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

 Location: Salakam cheruvu Village, Tehsil Singanamala, Anantapuram district of Andhra Pradesh. The geographical coordinates of the proposed upper reservoir are at longitude 77°41'40.75"E & latitude is 14°51'10.11"N and that of existing lower reservoir are at 77°43'5.18"E and 14°50'50.03"N. structed newly) and Singanamala PSP Upper Reservoir (to be constructed newly). The proposed upper reservoir and lower reservoirs are not located on any river course.

- ii. Singanamala Pumped Storage Project (SPSP) is an Off-Stream Closed Loop Pumped Storage development, proposed with an installed capacity of 800MW/5248 MWH. The Project comprises of development of upper & lower reservoirs with a gross storage capacity of 0.73TMC & 0.59 TMC respectively, out of which upper reservoir to be constructed on the hill top with maximum dam height of 54 m to create the desired storage capacity while the lower reservoir will have maximum height of 34 m constructed at the downhill.
- iii. The Singanamala PSP envisages construction of Upper reservoir which is proposed to be located on hill top. The water from upper reservoir shall be utilized for peaking power generation. After generation, the water from Lower dam shall be pumped back to upper dam during off peak hours through reversible turbines.
- iv. The storage project is proposed with the following major components
  - a. Formation of Upper reservoir
  - b. Upper Intake from Upper reservoir
  - c. A Concrete lined Head Race Tunnel
  - d. Surge Tank & steel lined penstock tunnel/pressure shaft to feed water to generating units
  - e. Concrete Lined Tail Race Tunnel
  - f. Powerhouse, switch yard and other auxiliary units
- v. **Land requirement**: The total land required for construction of project components, reservoir area, muck dumping, construction camps and colony, etc., works out to be 480.65 ha (248.32 forest land & 232.33 Non Forest land.
- vi. The proposed Pumped storage project is a pumped storage project, no consumptive utilisation of water is envisaged, except for recouping the evaporation losses of 0.968 MCum in the upper & lower reservoirs. All the project components of the proposed PSP are within the state of Andhra Pradesh and the submergence due to construction of upper reservoir also lies within the state of Andhra Pradesh. As the Consumptive use of the project is only 0.968 MCum, which is a continuous requirement, is only be applicable for consideration of inter-state aspects. However, the water will be allocated from the states share of water, as such no interstate issue on sharing of water is not envisaged at this stage. All the project components and the submergence due to upper reservoir are completely in the state of Andhra Pradesh. Hence, no Inter-State aspects of territory, property etc. coming under submergence, oustees rehabilitation, compensation etc.
- vii. The project area is located in the Ananthapur district in the Rayalseema region of Andhra Pradesh. As per the seismic map zone of India, the Project area lies in the seismic zone-II. The area has not experienced any major earthquakes so far.
- viii. The proposed project is an off stream closed loop project with an installed capacity of 800MW/5248 MWH. The land required for the proposed upper reservoir and upper intake is 124.98 ha and the land required for the proposed lower reservoir and upper intake is 132.36 ha.
- ix. The total project cost Rs. 456764.71 Lakhs (4567.64 Cr).
- x. The Salient features of the project is as under: -

	NAME OF THE PROJECT		SINGANAMALA PUMPED	
			STORAGEPROJECT	
1		Type of Project		
	a	Туре	Off Stream Closed Loop Pumped Storage	
			Project	
	b	Storage Capacity	5248 MWH	
	с	Rating	800 MW	
	d	Peak operation duration	6.56 Hours daily	
2		Upper Reservoir (Proposed)		
	a	Live Storage	0.52 TMC (14.625 MCM)	
	b	Dead Storage	0.21 TMC (5.96 MCM)	
	с	Gross Storage	0.73 TMC (20.58 MCM)	
3		Upper Dam		
	a	Type of Dam	Rock fill & Concrete Spillway	
	b	Top of Dam	EL +490.000 m	
	с	Full Reservoir level (FRL)	EL +485.000 m	
	d	Minimum Draw Down Level (MDDL)	EL +465.000m	
	e	Length of Dam	667m	
	f	Max Height of Embankment	54.0 m (above Lowest NSL)	
	g	Top Width of Embankment	10.0 m	
4		Upper Spillway		
	a	Type of spillway	Free flow Roller compacted concrete (RCC) spillway	
	b	No. of opening	1 No.	
	с	Width of opening	50 m	
	d	Crest level	EL +485.00 m	
	e	Maximum water level (MWL)	EL +487.00 m	
5		Lower Reservoir (Proposed)		
	a	Live Storage	0.52 TMC (14.85 MCM)	
	b	Dead Storage	0.07 TMC (1.946 MCM)	

	c	Gross Storage	0.59 TMC (16.80MCM)
6		Lower Dam	
	a	Type of Dam	Rock fill & Concrete Spillway
	b	Top of Dam	EL +340.000 m
	с	Full Reservoir level (FRL)	EL +335.000 m
	d	Minimum Draw Down Level (MDDL)	EL +317.000m
	e	Length of Dam	506.0 m
	f	Max Height of Dam	34.0 m (above Lowest NSL)
	g	Top Width of Dam	10.0 m
7		Lower Spillway	
	a	Type of spillway	Free flow Roller compacted concrete (RCC) spillway
	b	No. of opening	1 No.
	c	Width of opening	50 m
	d	Crest level	EL +335.00 m
	e	Maximum water level (MWL)	EL +337.00 m
8		Intake Structure (Upper Intake)	
	a	Туре	Diffuser Type
	b	Number of Vents	2 No.
	c	Size of Intake	35.25m (W) x 12.25 m (H) including piers
	d	Length of Intake	71.60 m (covered with RCC slab at top up to Starting of HRT)
	e	Elevation of Intake center line	EL +450.00 m
	f	Elevation of Intake bottom	EL +445.00 m
	g	Design Discharge of Intake (Turbine mode)	155.33 Cumec for one unit
	h	Trash rack type	Vertical with inclination of 150
	i	Size of Trash Rack	3 nos. Of 9.75m(W) x 12.25m(H) of each intake
	j	Velocity through Trash rack	0.985 m/s
	k	Numbers & Size of Intake Service Gate	2 Nos 8.5 m (W) x 10.00 m (H) with

			Independent Rope Drum Hoist
	L	Numbers & Size of Intake Maintenance	1 No. – 8.5 m (W) x 10.00 m (H)
		Gate	with Common Movable Gantry Crane
9		Water Conductor System	
	Ι	Intake Tunnel	
	a	Туре	Horseshoe Tunnel
	b	Number of Tunnels	2 No.
	c	Diameter of Tunnel	10.0 m dia.
	d	Length of Tunnel	608.50 m
	e	Design Discharge of Tunnel	310.66 Cumec
	f	Velocity in the Tunnel	3.955 m/sec
	II	8.5m dia Penstock	
	a	Туре	Circular
	b	Number of Penstock	2 Nos
	c	Diameter of Penstock	8.5 m dia.
	d	Design Discharge in main penstock	310.66 Cumec
	e	Velocity in the Tunnel	5.475m/sec
	f	Length	544.90 m for each Tunnel
	g	Thickness of Steel Liner	24 mm to 47mm
	h	Grade of Steel Plate	ASTM 517 Grade-F Steel
	III	6.0m dia Pressure Shaft	
	a	Туре	Steel lined – circular
	b	Number of Pressure Shafts	4 Nos.
	c	Diameter of shaft	6.0 m dia.
	d	Length	92.50 m each
	e	Thickness of Steel Liner	35 mm
	f	Grade of Steel Plate	ASTM 517 GRADE-F
	IV	Main Inlet Valve (MIV)	
	h	Size of MIV	4.50 m Diameter

	V	20.0 m dia Surge Shaft	
	a	Type and Nos.	2 Nos. restricted orifice type circular
			surge shaft
	b	Diameter	20.0 m
10		Adit Tunnels	
	a	Adit to Penstock Bottom	1210.0 m long 6.5m dia. D Shaped Tunnel
	b	Escape Tunnel	61.0 m long 6.50 m dia. D Shaped Tunnel
11		Powerhouse	
	a	Туре	Surface Powerhouse
	b	Center Line of Unit	El. +287.00 m
	с	Size of Powerhouse	118.00 m (L) x 25.50 m (W) x 51.00 m
			(H) at Generator Floor Level
	d	Size of Service bays	40.0 m (L) x 25.50 m (W) (Left Side
			Service Bay)
	e	Service bay level	El. +303.15 m
	f	Crane Beam Level in Powerhouse	El. +315.65m
	g	Size of Unloading Bay	20 m (L) X 25.50 m (W)
	h	Unloading Bay Level	El. +327.200m

### **38.2.3:** The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of Terms of Reference to the project for Singanamala Pumped Storage Project of capacity 800 MW in an area of 480.65 Ha located at village Salakam cheruvu, Tehsil Singanamala, District Ananthapuramu (Andhra Pradesh) by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd (NREDCAP).

**38.2.4** The EAC after detailed deliberation on the information submitted and as presented during the meeting *recommended* for grant of Standard ToR for conducting EIA study for Singanamala Pumped Storage Project of capacity 800 MW in an area of 480.65 Ha located at village Salakam cheruvu, Tehsil Singanamala, District Ananthapuramu (Andhra Pradesh) by M/s New and Renewable Energy Development Corporation of Andhra Pradesh Ltd (NREDCAP), under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

### [A] Environmental Management and Biodiversity Conservation:

- i. Alternative site analysis shall be carried out in terms of ecological aspects viz. loss of Forest ecosystem due to diversion of Forest land/ loss of biodiversity and its impacts on productivity of the ecosystem, water availability, eco-sustainability of water source be used for generation of hydro power and Ecological flows in the small stream/ Nallah. Preference shall be given to minimize forest land.
- ii. WRD permission to take water from Chagallu barrage be submitted.
- iii. Approved Hydrological study report, E-flow of Chagallu barrage from CWC be submitted.
- iv. Alternative study carried out for reducing requirement of Forest land for the Construction of proposed project.
- v. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
- vi. 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.
- vii. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.
- viii. Possibility impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources (Chagallu Barrage) shall be studied.
- ix. Details about other projects located on the river basin along with their longitudinal distance between two projects be submitted.
- x. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.
- xi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material be submitted.
- xii. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
- xiii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside from any Eco Sensitive Zone (ESZ) and no Wildlife Sanctuary falls within 10 km of Project site.
- xiv. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
- xv. In case any Wildlife Corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
- xvi. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

- xvii. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR) and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
- xviii. MoU for water uses for the project shall be signed and approved by concerned authority.
- xix. Environmental matrix during construction and operational phase needs to be submitted.
- xx. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
- xxi. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
- xxii. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature required to be cut for reservoir creation and other project component.
- xxiii. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
- xxiv. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
- xxv. Stage-1 Forest Clearance shall be obtained.

### [B] Socio-economic Study

- xxvi. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policies issue is involved with any state in the project. Consent from other state for drawing of water from Narmada River, if required.
- xxvii. 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.
- xxviii. 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 30<sup>th</sup> September, 2020 shall be submitted.
- xxix. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.

### [C] Muck Management/ Disaster Management

- xxx. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
- xxxi. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.
- xxxii. Techno-economic viability of the project must be recommended from CEA/ CWC

# [D] Miscellaneous.

xxxiii. Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approved by CWC I CEA shall be submitted.

- xxxiv. Undertaking need to submitted on affidavit that regarding no activities has been yet on the project site and water allocated to this scheme shall not be diverted to other purpose.
- xxxv. Both capital and recurring expenditure under EMP shall be submitted.
- xxxvi. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
- xxxvii. Arial view video of project site shall be recorded and to be submit.
- xxxviii. The PP has to obtain clearance from inter-state aspect from the designated authorities as per procedure.

# Agenda Item No. 38.3

Warsgaon Warangi Pumped Storage Project (1200 MW) in an area of 169 Ha located at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited – Terms of Reference (TOR) - reg.

# [Proposal No. IA/MH/RIV/407676/2022; F. No. J-12011/19/2022-IA.I (R)]

**38.3.1:** The proposal is for grant of terms of reference to Warsgaon Warangi Pumped Storage Project of capacity 1200 MW in an area of 169 ha at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited.

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

- i. The proposal is for grant of terms of reference to the project for Warsgaon Warangi Pumped Storage Project of capacity 1200 MW in an area of 169 ha at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited.
- ii. The proposed project Warasgaon Warangi Pumped Storage Project ("Project") is an Off-River PSP scheme with an installed capacity of 1200 MW (5 x 240 MW) with both upper and lower reservoirs located across minor nallahs in their initial reaches, wherein the flows are only seasonal during monsoon. The project area is in the Sahyadri ranges of the Western Ghats of Maharashtra State in the area bordering Pune and Raigad districts.
- iii. The upper dam is located on a rocky ridge near Teckpole village in Velhe Taluka, Pune district of Maharashtra state having a geographical latitude 18° 18' 20.3" N and longitude 73° 27' 47.42" E. The lower dam is located on a rocky ridge near Warangi village in Mahad Taluka, Raigad district of Maharashtra state having a geographical latitude 18° 16' 16.79" N and longitude 73° 27' 57.93" E.
- iv. Upper dam is proposed to be located across a minor nallah draining into Panshet Dam which is located on the Ambi river. Ambi river is a tributary of the Mutha River.Panshet Dam is located about 50 km south-west of Pune city in western India. Both

Ambi and Mutha river originate from the Western Ghats and flow eastward until it merges with the Mula River near Pune city. After merging with the Mula river, it called as Mula-Mutha River which further joins the Bhima River. The Bhima River is a major river in Western India and South India.

- v. Lower dam is proposed to be located across a minor nallah draining into Kal river which is a tributary of the Savitri River. The Kal River is one of the West Flowing Rivers in Maharashtra. Kal river is a major tributary of Savitri River. The project area is in the Sahyadri ranges of the Western Ghats
- vi. **Land requirement:** The total land required for the project components and related works has been estimated to be about 169 ha out of which 24.50 ha is forest land and 144.50 ha is non forest/private land.
- vii. The cost of the project is Rs. 4872 Crore at 2022-23 price level including Interest During Construction (IDC) of Rs. 528 Crore. As a preliminary estimate, a construction period of 5 years (60 months) from the date of award of civil works package has been estimated for this project.
- viii. Proposed project is located about 9.2 km away from boundary of Tamhini Wildlife Sanctuary. The final notification for ESZ of Tamhini Wildlife Sanctuary published by MOEF vide notification dated 25<sup>th</sup> February, 2021 and proposed project is located about 6.6 km away from final ESZ boundary of Tamhini Wildlife Sanctuary. Further, proposed project is falling under ESA of Western Ghat as per MOEF draft ESA notification dated 6<sup>th</sup> July 2022. However, Hydropower Projects are permitted in ESA of Western Ghats as per MOEF notification dated 20<sup>th</sup> December 2013. Location of reservoirs is on seasonal minor nallahs with very small catchment areas i.e. of the order of 2.5 km2 and 14.8 km2 for upper and lower reservoir respectively. Rainfall in the catchment will be able to meet the recuperating losses.
- ix. The proposed Warasgaon Warangi PSP (5 x 240 MW) envisages following major civil structures:

S. No.	Project Component	Details	
1.	Upper Dam (Concrete	Crest length 490 m, maximum height 57 m above the	
	Dam)	deepest riverbed level. Gross storage capacity of Upper	
		reservoir is 8.96 Mm3	
2.	Lower Dam (Concrete	Crest length 820 m, maximum height 51 m above the	
	Dam)	deepest river bed level. Gross storage capacity of Lower	
		reservoir is 12.28 Mm3.	
3.	Upper Intake/Outlet	Horizontal pit type intake, 4 nos. of trash rack bays, each	
		with a size of 8.5 m (W) x 12.0 m (H).	
4.	Lower Intake/Outlet	Horizontal pit type intake, 4 nos. of trash rack bays, each	
		with a size of 7.5 m (W) x 12.0 m (H)	
5.	Headrace Tunnel	1385 m (length), 9.0 m (dia.), horse-shoe shaped,	
		concrete lined	

6.	Surge Shaft	Restricted orifice type, 15 m dia., 95 m high, circular,	
		concrete lined	
7.	Pressure Shaft	1500 m (length), 7.0 m (diameter), steel lined and	
		branching near powerhouse, each with 3.2 m diameter	
8.	Surface Powerhouse	166 m (L) x 24 m (W) x 39m (H)	
9.	Tailrace Tunnel	132 m (length), 8.0 m (diameter), horse-shoe shaped,	
		concrete lined.	
10.	Approach road	Strengthening of existing roads - 10 km	
		Construction of new road - 15 km	
11.	Adit	Adit to bottom horizontal pressure shaft- 1.5 km	

# x. **Project benefit:**

- a) Warasgaon Warangi PSP has been designed to meet the peaking requirement daily in the southern region grid and the state of Maharashtra for a duration of about seven (7) hours.
- b) The energy output of the project with an installed capacity of 1200 MW has been estimated as 2913 MU annually.

### xi. **R & R details:**

Based on the preliminary layout formulated for proposed Warasgaon Warangi PSP, the project prima-facie does not involve submergence of large habitations or large area of agricultural lands and R & R issue are minimal. Upper reservoir area is completely non-forest land, however, no habitation is there. Lower reservoir area has a forest patch, however, it is largely non-forest land where few houses and agricultural land is observed. In addition to the above land under submergence, additional land is required for construction of civil structures and other project components, which will be located on non-forest land. Based on the above, 144.5 ha has been identified as non-forest land requirement for the project.

In view of the above, private land is proposed to be purchased through private negotiations, as it is within the specified limits by the relevant rules notified by the State Government, related to rehabilitation and resettlement under RFCTLARR, 2013.

The detailed requirements for the R&R plan, if applicable, will be based on the social-economic survey and land utilization for the project. Due consideration ought to be given to the societal requirements in developing the R&R plan as a part of EIA/EMP studies.

### **38.3.3:** The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of terms of reference to the project for Warsgaon Warangi Pumped Storage Project of capacity 1200 MW in an area of 169 ha at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited.

The project/activity is covered under category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

The proposed project comes under ESA of Western Ghats (Maharashtra) and as per O.M dated 20<sup>th</sup> December, 2013, hydro power projects are allowed in Western Ghats ESA.

**38.3.4** The EAC after detailed deliberation on the information submitted and as presented during the meeting *recommended* for grant of Standard ToR for conducting EIA study for Warsgaon Warangi Pumped Storage Project of capacity 1200 MW in an area of 169 ha at Village Teckpole and Warangi, Tehsil Velhe and Mahad, District Pune and Raigad (Maharashtra) by M/s Adani Green Energy Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

# [A] Environmental Management and Biodiversity Conservation:

- i. Tentative estimation of muck generation with their disposal sites along with protection.
- ii. Cumulative Impact of project on carrying capacity and sustainability of Kali river/ nalahs of catchment area / due to tapping of water for filling reservoir.
- iii. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which 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. 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.
- v. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.
- vi. The study shall be conducted and approved by CWC regarding assessment of E-Flow of water in the river in terms of draft notification S.O. 3072(E) dated 6<sup>th</sup> July, 2022 issued by the Ministry for Western Ghats.
- vii. Details about other projects located on the river basin of river Kali along with their longitudinal distance between two projects be submitted. In case of more than one project a detailed Cumulative Impact Assessment and Carrying Capacity study covering aspects related to impact of each project on the flow pattern of the rivers and forest and biodiversity shall be conducted through a reputed Government institute having expertise in the area.
- viii. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.

- ix. Source of construction material and its distance from the project site along with detailed transportation plan for construction material in view of the project site location in Western Ghats be submitted.
- x. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
- xi. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ) and no Wildlife Sanctuary falls within 10 km of Project site.
- xii. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
- xiii. In case any Wildlife Corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
- xiv. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
- xv. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR) and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
- xvi. MoU for water uses for the project shall be signed and approved by concerned authority.
- xvii. Environmental matrix during construction and operational phase needs to be submitted.
- xviii. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
- xix. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
- xx. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature required to be cut for reservoir creation and other project component.
- xxi. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
- xxii. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
- xxiii. Stage-I Forest Clearance shall be obtained.
- xxiv. Cumulative impact assessment study shall be carried out.
- xxv. Study report on impact on River Rejuvenation shall be submitted.

### [B] Socio-economic Study

- xxvi. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policies issue is involved with any state in the project. Consent from other state for drawing of water from Narmada River, if required.
- xxvii. 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.

- xxviii. 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.
- xxix. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
- xxx. Details of settlement in 10 km area shall be submitted.

### [C] Muck Management/ Disaster Management

- xxxi. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
- xxxii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.
- xxxiii. Techno-economic viability of the project must be recommended from CEA/ CWC

### [D] Miscellaneous.

- xxxiv. Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approved by CWC I CEA shall be submitted.
- xxxv. Undertaking need to submitted on affidavit that regarding no activities has been yet on the project site and water allocated to this scheme shall not be diverted to other purpose.
- xxxvi. Both capital and recurring expenditure under EMP shall be submitted.
- xxxvii. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
- xxxviii. Arial view video of project site shall be recorded and to be submitted.
- xxxix. The PP has to obtain clearance from inter-state aspect from the designated authorities as per procedure.

#### Agenda Item No. 38.4

Damanganga (Ekdare) - Godavari intrastate link project at Village Ekdare, Tehsil Peint, District Nashik (Maharashtra) by M/s National Water Development Agency- Terms of Reference (TOR) -reg.

### [Proposal No. IA/MH/RIV/88394/2018; F. No. J-12011/03/2019-IA-1 (R)]

**38.4.1:** The proposal is for grant of terms of reference to the project for Damanganga (Ekdare) - Godavari intrastate link project at Village Ekdare, Tehsil Peint, District Nashik (Maharashtra) by M/s National Water Development Agency.

**38.4.2** The proposal was earlier considered by the EAC in its 26<sup>th</sup> meeting held on 20.08.2019, wherein the EAC deferred the proposal with the opined that the PP shall have to come prepared

with a detailed presentation about the scheme and the other sites / alternates so as to reduce the static head and requirement of power'.

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

- i. The project will divert surplus water available in Damanganga basin (Ekdare Dam proposed) to Upper Godavari sub-basin (Waghad Dam existing) in Godavari river basin.
- ii. The Damanganga (Ekdare) Godavari (Waghad) link project envisages diversion of about 138.6 MCM of surplus water available in the catchment of Damanganga basin up to proposed Ekdare dam site to existing Waghad reservoir in Godavari valley, by lift in three stages at Ekdare, Nirgude & at the proposed Circular sump with a total static lift of 327.40m.
- iii. The total conveyance system of 13.62 km comprises a pipe line of 10.42 km (rising main) by lift up to Jharlipada Diversion scheme and 3.20 km by gravity (1.30 km ridge cut between Damanganga to Godavari basins) & 1.90 km of natural stream of Kadwa river up to Waghad Reservoir.
- iv. The structural component of the link system consists of one proposed Ekdare dam, conveyance system of 13.62 km length, two proposed weirs, i.e. Hatti & Nirgude, Intermediate Circular sump and underground RCC pipe line between the proposed Hatti & Nirgude weirs. The available waters will be lifted by the 3 Pump houses at Ekdare, Nirgude & Circular Pump by the rising mains to divert in to the existing Jharlipada Diversion scheme.
- v. **Submergence area**: The submergence area at FRL is 247.4 ha. Out of which about 53.40 ha is river course, 41.91 ha is forest area and 152.09 ha Govt. land & private land. No villages are coming under submergence.
- vi. **Use of Water**: The proposed utilization from the Ekdare reservoir is fixed at 143 MCM out of which,4.4 MCM is kept reserved for local use and remaining 138.6 MCM is proposed for lifting to Waghad dam. The link project will benefit a total area of 18404 ha irrigation out of which 687 ha will be benefitted in command areas within Damanganga basin for local use in Nasik district and the remaining 17717 ha will be benefitted in Upper Godavari sub-basin in the command of existing Jayakwadi project in Marathwada region.
- vii. **Land requirement**: The total land requirement for the proposed Damaganga (Ekdare)-Godavari (Waghad) link project is **261.99 ha**, out of which **44.76** ha is forest land, for which forest clearance to be obtained under Forest Conservation Act.
- viii. **Ecological Sensitive Area, if any within 10km of project site**: No Protected area falls within 10 km of project area. Distance of Tana Wildlife Sanctuary is about 49.70 km from the proposed submergence area of Ekdare dam. Therefore, Wildlife Clearance is not applicable.
- ix. As per the recommendations of the CWC during field visit, it is proposed to construct the Ekdare as Roller Compacted Concrete dam (69.50 m height 302.00 m long) across Damanganga river near Ekdare village of Peint taluk, Nasik district in Maharashtra. The

FRL and MDDL of Ekdare reservoir would be 374.00 m, 345 m respectively and the corresponding storages are 36.41 MCM and 7.04 MCM respectively.

# **38.4.3:** The EAC during deliberations noted the following:

The proposal is for grant of terms of reference to the project for Damanganga (Ekdare) - Godavari intrastate link project at Village Ekdare, Tehsil Peint, District Nashik (Maharashtra) by M/s National Water Development Agency.

Damanganga (Ekdare)-Godavari intra-state link project, envisages diversion of 143 million m3 of water from the Damanganga basin to the water short Gangapur Reservoir of Nashik District in the Godavari Basin.Ekdare Dam is proposed to store water in monsoon. Ekdare Dam project is located in the Peint tehsils of Nashik District. The Catchment area at the proposed site is 200 km2 and the proposed submergence area is 620 ha. At 75% dependable. Annual yield is 199.10 MCM, while 143 MCM is the proposed diversion.

The EAC after detailed deliberation **recommended** the proposal for grant of applicable Standard TOR along with following addition TOR for conducting EIA study:

- i. Study on costal impact due to diversion of water from Damanganga to Godavari River.
- ii. E- flows study required for sustainability of aquatic ecosystem of both rivers i.e Damanganga and Godavari River.
- iii. If water diverted one basin to other basin, the impact of the aquatic ecosystem and quality of water needs to be studied.
- iv. The quantity of water goes into Arabian sea from Damanganga needs to be studied.
- v. The study on impact of diversion of water from Damanganga river particularly in the stretch of river between diversion point to confluence with Arabian sea.

### Agenda Item No. 38.5

### Additional Agenda item:

Lower Orr Dam project under Ken-Betwa Link Project Phase II (90000 CCA) in an area of 3007.2 ha at Village Didoni, Tehsil Chanderi, District Ashoknagar, Madhya Pradesh by M/s National Water Development Agency – Site visit report – reg.

### [Proposal No. IA/MP/RIV/255619/2013; F. No. J-12011/31/2011-IA.I]

**38.5.1:** The Member Secretary informed to the EAC that in compliance of recommendations of the EAC (RVHEP) during its 28<sup>th</sup> meeting held on 31<sup>st</sup> May, 2022. The sub-committee comprising 4 EAC members namely Dr. A. K. Malhotra, Shri K. Gowarppan, Shri Ashok Kharya, Dr. J. A. Johnson and Shri Yogendra Pal Singh (Member Secretary, EAC) visited the project site during 9<sup>th</sup> -11<sup>th</sup> November, 2022. The Sub-committee has submitted its report for consideration of the EAC on 13<sup>th</sup> December, 2022. The site visit report is annexed at Annexure-II.

The Sub-Committee visited the following areas:

- 1) Pipe factory where the PP has given a presentation about the overview of the project
- 2) Operators barracks,
- 3) site office complex,
- 4) earthen dam,
- 5) the concrete weir area
- 6) quarrying sites

### The Sub-Committee during site visit observed the following:

- i. Lower Orr major irrigation project is one of the project under Ken-Betwa Link Project, Phase-II for providing irrigation in water deprived area (90000 Ha) of Bundelkhand region in Shivpuri and Datia district of M.P. The project has been conceived for providing assured irrigation facility to 90000 ha area in water deprived Shivpuri and Datia districts during Rabi season with 100% intensity of irrigation by pressurized distribution network.
- ii. Provision of 6 MCM of water has been kept for providing drinking water facility to 1.65 lakh population in the area.
- iii. The Cost Estimate of Lower Orr major irrigation project has been finalized by CWC, Govt. of India for Rs. 2657.03 Cr based on MP Unified Schedule of Rates 2017-18. Revised cost at price level 2020-21 is 3101.41 cr.
- iv. Total affected land 3020.49 ha. (Forest Land 991.79Ha.). Stage-I & Stage-II FC has been issued by the Ministry on 12<sup>th</sup> February, 2019 and 06<sup>th</sup> May, 2021 respectively for diversion of 968.24 ha. Forest land.
- v. The contract was awarded for construction of dam on 23<sup>rd</sup> February, 2018 after obtaining administrative approval of govt. of M. P. construction work was initiated on non-forest land.
- vi. The project construction work is in progress and the construction work has attained overall progress more than 60% (Dam construction-82%, Canal Network 33.50%).
- vii. The Project Proponent has started construction work of the project after recommendation of the EAC, no Environmental Clearance has been issued by the Ministry till date.
- viii. No Consent to establish/Consent to operate was obtained by the Project Proponent before starting the construction work.
- ix. Status of implementation of Catchment Area Treatment Plan and R&R has to be submitted by the project proponent.
- x. No plantation /afforestation has commenced so far excepting some few in the office complex.
- xi. Barrack area was not in order.
- xii. The muck management was very poor and no reclamation activity has commenced.
- xiii. The workmanship of slope, pitching and dam top were not up to the mark.
- xiv. Most of the trees have not been removed before the onset of submersion in the reservoir area.

The EAC Sub-Committee has recommended for submission of information so that ecological damage caused due to start of construction of project without environmental clearance can be assessed. After calculation of damage cost the EAC may suggest ecological restoration plan to be implemented by the project authorities.

# **38.5.2:** The EAC during deliberations noted the following:

The EAC deliberated on the site visit report and observed that the project authorities have violated the provisions of the EIA Notification, 2006 and started the construction work of the project without Environmental Clearance. It was also observed that during construction of the project environmental safeguard conditions suggested by the EAC while recommending the project for grant of Environmental Clearance in its meeting 93<sup>rd</sup> meeting held on 2<sup>nd</sup> May, 2016 have not been complied with. Accordingly, it is essential to have an ecological damage assessment study as per laid down procedure of the Ministry so as to suggest the appropriate environmental damage restoration plan in order to develop the project in ecologically sustainable manner.

**38.5.3:** The EAC after detailed deliberation on the EAC Sub- Committee site visit report recommended that the Ministry may consider for taking necessary action on the violation against the project proponent as per law. The Project Authorities may conduct study as per following additional ToR for assessment of environmental damage caused due to start of construction of project without obtaining prior Environmental Clearance, in terms of Office Memorandum dated 7<sup>th</sup> July, 2021 and submit revised EIA/EMP report for further consideration of the proposal under the provisions of EIA Notification, 2006, as amended:

- i. Assessment of ecological damage with respect to air, water, land and other environmental attributes shall be carried out by the accredited consultant of the PP. The collection and analysis of data shall be done by an environmental laboratory duly notified under the Environment (Protection) Act, 1986, or an environmental laboratory accredited by NABL, or a laboratory of a Council of Scientific and Industrial Research (CSIR) institution working in the field of environment.
- *ii.* Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity.
- *iii.* Environmental matrix during construction and operational phase needs to be submitted. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
- *iv.* Status of implementation of Rehabilitation and Resettlement Plan with details about socio-economic status of Rehabilitated families, indicating their present settlement and its distance from the project cover area be provided.
- v. Both capital and recurring expenditure incurred under EMP till date along with total budget outlay on EMP shall be submitted.
- vi. The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.

- vii. The State Government / SPCB to ensure that the case shall be filed against the project proponent for violation of the EP Act, 1986, and further no consent to operate or occupancy certificate to be issued till the project is granted EC.
- viii. The project proponent shall be required to submit a bank guarantee equivalent to the amount of remediation plan and natural and community resource augmentation plan with the SPCB prior to the grant of EC. The quantum shall be recommended by the EAC and finalized by the regulatory authority. The bank guarantee shall be released after successful implementation of the EMP, followed by recommendations of the EAC and approval of the regulatory authority.
- *ix.* Preparation of EMP comprising remediation plan and natural and community resource augmentation plan corresponding to the ecological damage assessed and economic benefits derived due to violation to be done.
- *x.* The remediation plan and the natural and community resource augmentation plan to be prepared as an independent chapter in the EIA report by the accredited consultants.

The meeting ended with vote of thanks to the Chair.

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#### **ANNEXURE-I**

# ATTENDANCE LIST

Sr.	Name & Address	Role	Attendance
No.			
1.	Dr. A. K. Malhotra	Chairman	Р
2.	Dr. N. Lakshman	Member	Р
3.	Dr. Mukesh Sharma	Member	Р
4.	Dr. Uday Kumar R. Y.	Member	Р
5.	Shri Ashok Kharya	Representative of CWC	Р
6.	Shri Sharvan Kumar	Representative of Central Electricity	Р
		Authority (CEA)	
7.	Dr. Amiya Sahoo	Member	Р
8.	Shri Yogendra Pal Singh	Member Secretary	Р

Site Visit Report the EAC (Sub-Committee) Visit of Lower Orr Dam project under Ken-Betwa Link Project Phase II (90000 CCA) in an area of 3007.2 ha at Village Didoni, Tehsil Chanderi, District Ashoknagar, Madhya Pradesh by M/s National Water Development Agency - Environmental Clearance from 9<sup>th</sup> - 11<sup>th</sup> October, 2022 -

#### Background

1. The proposal is for grant of Environmental Clearance to the project for Lower Orr Dam project under Ken-Betwa Link Project Phase II (90000 CCA) in an area of 3007.2 ha at Village Didoni, Tehsil Chanderi, District Ashoknagar, Madhya Pradesh by M/s National Water Development Agency.

2. Earlier, the EAC in its 93<sup>rd</sup> meeting held on 2nd May, 2016 has recommended the proposal for grant of Environmental clearance subject to the submission of Stage - I forest clearance of proposed project. The recommendation of the EAC were communicated to PP vide Ministry's letter dated 29<sup>th</sup> July, 2016.

3. Thereafter, the project proponent submitted the Stage-I Forest Clearance (issued by the MoEF&CC on 12<sup>th</sup> February, 2019) after almost 31 months (submitted on PARIVESH on 16<sup>th</sup> October, 2020). Accordingly, the proposal was again referred to EAC in terms of the provisions of the MoEF&CC O.M. dated 19<sup>th</sup> June, 2014. The EAC considered the proposal in its meeting held on 29<sup>th</sup> October, 2020, 14<sup>th</sup> March 2022 and 31<sup>st</sup> May, 2022. The EAC noted that PP has started the construction work without getting Environmental Clearance.

4. The EAC after deliberations decided to conduct site visit before making any recommendations on proposal. Earlier, the site visit was scheduled during 8<sup>th</sup> - 10<sup>th</sup> September, 2022; however, as per request received from the Project Proponent, the same was postponed. The rescheduled site visit was done by the Sub Committee during 9<sup>th</sup> -11<sup>th</sup> November, 2022. Following expert members of the EAC have visited the Lower Orr project site:

- 1. Dr. A.K. Malhotra
- 2. Shri Ashok Kumar Kharya
- 3. Shri K. Gowarappan
- 4. Dr. J.A. Johnson
- 5. Shri Yogendra Pal Singh
- 5. The Sub-Committee visited the following areas:
  - i. Pipe factory where the PP has given a presentation about the overview of the project
  - ii. Operators barracks,
  - iii. site office complex,
  - iv. earthen dam,
  - v. the concrete weir area
  - vi. quarrying sites

- 6. The Sub-Committee during site visit observed the following:
  - i. Lower Orr major irrigation project is one of the project under Ken-Betwa Link Project, Phase-II for providing irrigation in water deprived area (90000 Ha) of Bundelkhand region in Shivpuri and Datia district of M.P. The project has been conceived for providing assured irrigation facility to 90000 ha area in water deprived Shivpuri and Datia districts during Rabi season with 100% intensity of irrigation by pressurized distribution network.
- ii. Provision of 6 MCM of water has been kept for providing drinking water facility to 1.65 lakh population in the area.
- The Cost Estimate of Lower Orr major irrigation project has been finalized by CWC, Govt. of India for Rs. 2657.03 Cr based on MP Unified Schedule of Rates 2017-18. Revised cost at price level 2020-21 is 3101.41 cr.
- iv. Total affected land 3020.49 ha. (Forest Land 991.79Ha.). Stage-I & Stage-II FC has been issued by the Ministry on 12.02.2019 and 06.05.2021 respectively for diversion of 968.24 ha. Forest land.
- v. The contract was awarded for construction of dam on 23.02.2018 after obtaining administrative approval of govt. of M. P. construction work was initiated on non-forest land.
- vi. The project construction work is in progress and the construction work has attained overall progress more than 60% (**Dam construction-82%**, **Canal Network 33.50%**).
- vii. The Project Proponent has started construction work of the project after recommendation of the EAC, no Environmental Clearance has been issued by the Ministry till date.
- viii. No Consent to establish/Consent to operate was obtained by the Project Proponent before starting the construction work.
- ix. Status of implementation of Catchment Area Treatment Plan and R&R has to be submitted by the project proponent.
- x. No plantation /afforestation has commenced so far excepting some few in the office complex.
- xi. Barrack area was not in order.
- xii. The muck management was very poor and no reclamation activity has commenced.
- xiii. The workmanship of slope, pitching and dam top were not up to the mark.
- xiv. Most of the trees have not been removed before the onset of submersion in the reservoir area.

7. Regularization of violation cases involves two components (As per S.O.P vide O.M. dated 07<sup>th</sup> July, 2021):

**[I] Ecological Damage assessment and restoration:** Assessment of environmental / ecological damage with respect to air, water, noise, soil/land, flora & fauna, occupation health and other environmental attributes and preparation of Remediation plan.

# **[II]** Penalty on the basis of Polluter Pay Principle:

- i. Where operation has not commenced: 1% of the total project cost incurred up to the date of filing of application along with EIA/EMP report; [Ex: Rs.1 lakh for project cost of Rs. 1 Cr]
- ii. Where operations have commenced without EC: 1% of the total project cost incurred up to the date of filing of application along with EIA/EMP report PLUS 0.25% of the total turnover during the period of violation. [Ex: For Rs.100 Cr project cost and Rs.100 Cr total turnover, the penalty shall be Rs.1 Cr + Rs. 0.25 Cr = Rs. 1.25 Cr]

8. The EAC Sub Committee has recommended for submission of information so that ecological damage caused due to start of construction of project without environmental clearance can be assessed. After calculation of damage cost the EAC may suggest ecological restoration plan to be implemented by the project authorities.

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Figures: Construction work of main Dam, quarrying sites and dumping of construction material





# **APPROVAL OF THE CHAIRMAN**

From: <u>ajitkumarmalhotra463@gmail.com</u> To: "Yogendra Pal Singh" <<u>yogendra78@nic.in</u>> Sent: Thursday, January 5, 2023 10:51:30 AM Subject: Re: Draft MOM of the 38th EAC (RV&HEP) meeting held on 15.12.2022 - reg.

The minutes are in order and I agree with them. Stand approved.

On Thu, 5 Jan 2023, 10:45 Yogendra Pal Singh, <<u>vogendra78@nic.in</u>> wrote: | Dear Sir,

please see the trailing emails and comments from respected EAC members. It is reputed to approve the draft MoM of the EAC meeting held on 15/12/2022, so that the same can be uploaded on the PARIVESH portal of the Ministry.