

**Minutes of the 18<sup>th</sup> Meeting of the Expert Appraisal Committee for River Valley & Hydroelectric Projects held on 27.09.2018 at Narmada Meeting Hall, Ground Floor, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-3.**

The 18<sup>th</sup> meeting of the re-constituted EAC for River Valley & Hydroelectric Projects was held on 27.09.2018 with the Chairmanship Dr. S.K. Jain in the Ministry of Environment, Forest & Climate Change at Narmada Meeting Hall, Ground Floor, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi. The following members were present:

- |     |                          |   |                         |
|-----|--------------------------|---|-------------------------|
| 1.  | Dr. S.K. Jain            | - | Chairman                |
| 2.  | Shri Sharvan Kumar       | - | Representative of CEA   |
| 3.  | Shri N.N. Rai            | - | Representative of CWC   |
| 4.  | Dr. A.K. Sahoo           | - | Representative of CIFRI |
| 5.  | Dr. J.A. Johnson         | - | Representative of WII   |
| 6.  | Shri Chetan Pandit       | - | Member                  |
| 7.  | Dr. D.M. More            | - | Member                  |
| 8.  | Prof. S.R. Yadav         | - | Member                  |
| 9.  | Prof. Govind Chakrapani  | - | Member                  |
| 10. | Prof. S.K. Kohli         | - | Member                  |
| 11. | Dr. (Mrs.) Poonam Kumria | - | Member                  |
| 12. | Dr. S. Kerketta          | - | Member Secretary        |

Dr. Vijay Kumar, Dr. T.P. Singh and Dr. J.P. Shukla could not be present due to pre-occupation. Dr. S.K. Kohli, the new EAC Member in place of Dr. R. Vasudeva was welcome by the Chairman. The deliberations held and the decisions taken are as under:

**Item No. 18.0 Confirmation of minutes of 17<sup>th</sup> EAC meeting.**

The Minutes of the 17<sup>th</sup> EAC (River Valley & Hydroelectric Projects) meeting held on 27.08.2018 were confirmed.

**Item No. 18.1 Cumulative Impact Assessment and Carrying Capacity Study of Beas River Basin, Himachal Pradesh - Re-consideration of the Study Report before the EAC**

The Member Secretary briefed the EAC members the following:

1. The recommendations of the CIA & CCS report of Beas River Basin was deliberated along with the EAC sub-committee's site visit report in the 13<sup>th</sup> EAC meeting held on 27.04.2018 and in the 15<sup>th</sup> EAC meeting held on 28.06.2018, wherein EAC had asked Govt. of H.P. to make a comparative statement for all under-construction and operational projects about the release of e-flow and energy generation under three ,viz. present e-flow, e-flow as per NGT order and e-flow as per River Basin Study report. It was

- decided in the meeting that Beas RBS shall be deliberated after receiving the requisite information from Govt. of H.P.
2. Govt. of H.P, vide their letter dated 15.09.2018 had submitted the requisite information (comparative statements for three scenarios) for the following six HEPs: i) Parbati-II HEP, ii) Parbati-III HEP, iii) Thana Plaun HEP, iv) Nakthan HEP, v) Sainj HEP and vi) Dhaulasidh HEP. However, for the remaining HEPs, viz. Beas Satluj Link HEP, Larji HEP, Uhl-I HEP, Malana-I HEP, Malana - I HEP, Lambadug HEP, Uhl-III HEP and Malana-III HEP and for redefining the layout of Jobree, Bujling, Parbati, Sharni, Sarasadi-I and Sarasadi-II HEPs, Govt. of H.P had requested for two more months for submission of the above requisite information.
  3. The Member Secretary informed the EAC finalisation of the Beas RBS has already been delayed. , Hence, a short duration be allowed for submission of information. After deliberations, EAC recommended for one month only to the Govt. of H.P. for submission of the requisite information as detailed above.
  4. The State Govt. of H.P. did not attend the meeting for want of submission of above information. **It was decided that Beas RBS shall be deliberated again in the EAC meeting scheduled in October, 2018 Hence the matter was deferred.**

**Item No. 18.2 Renukaji Dam Project (40 MW) in Sirmaur district, Himachal Pradesh, M/s Himachal Pradesh Power Corporation Ltd.- reg. Amendment of Land requirement in the EC. (File No. J-12011/53/2018-IA.I(R) & Online No. IA/HP/RIV/10073/2018)**

Project Proponent applied for amendment of land requirement in the Environmental Clearance (EC) letter online on 02.06.2018. Earlier the proposal for increase of land requirement from 1,477.78 ha to 1988.27 ha was placed before the EAC meeting held on 28.8.2018. However, the recommendation of the land requirement couldn't be made due to want of the following information:

- i) A copy of the report submitted by the 8-member committee that has been constituted by the Hon'ble NGT, Principal Bench, New Delhi.
- ii) Point-wise EC compliance report of the project.
- iii) Status of implementation of CAT plan.
- iv) Present status of the construction work.

Accordingly, **the proposal was deferred.**

The PP submitted the additional information online on **29.08.2018** which were found to be in order. The proposal was once again placed before the present meeting for consideration by the EAC. The PP presented the proposal and *inter-alia*, reiterated the following submission:

- i) It is a water storage project on river Giri, a tributary of river Yamuna. It will help control floods in river Yamuna including supply of 23 cumecs of water to National Capital Delhi. The land requirement shown in the EC letter is 1477.78 ha. The extend of land requirement as shown in the EC is based on the summary submitted at the time of submission of the application for grant of EC in September, 2008 and was based on the land requirement calculated up to FRL/MRL. For safety reasons, land is being acquired up to 5.5 m above FRL of 772.50 m. Total land requirement for the project worked out in final EIA/EMP submitted was 2,239 ha. The total land requirement of the project after detailed investigation and survey and physical verification under Sections 6, 7 & 8 of Land Acquisition Act has been re-assessed as 1988.27 ha instead of 1477.78 ha.
- ii) Now the land requirement has been finalized to be 1988.27 ha. Out of which, 909 ha is forestland (Territorial Forest = 646.00 ha, Sanctuary area = 49.00 ha, Deemed forest (Govt. land) = 80.00 ha, Kisam jungle jhadi = 134.00 ha), 1065.4 ha is private and 14.62 ha is Govt. Land. Out of total land to be acquired, an area of 1579.80 ha will be submerged. In-Principle approval by the Ministry of Environment, Forest and Climate Change has been accorded for diversion of 909 ha forest area vide F.No.8-41/2009-FC dated 20.02.2015.
- iii) Subsequently, grant of Environment Clearance was challenged by local people before the National Environment Appellate Authority (NEAA) (later on National Green Tribunal) during November, 2009 and before High Court, Shimla during 2010. All the three PILs have also been filed in Hon'ble High Court on the similar issue. The petition and PIL's pending before the Hon'ble High Court have been transferred and clubbed with the case in NGT. The Hon'ble NGT has disposed of all appeals by a common judgment on 02.02.2016.
- iv) In the order, the Hon'ble NGT has constituted an 8-member committee to study and examine the sufficiency of all compliances on the Project and submit its report. Committee submitted the affidavit in Hon'ble NGT that State Govt. will make necessary amendments in land requirement of EC as finalized. The report of the committee was placed before the EAC.
- v) Installed capacity of the project is 40 MW and it shall generate 211 million units annually. The total cost of the project is Rs. 4596.76 crores at March, 2015 price level, of which the cost of implementation of EMP is Rs. 449.11 crores. 2% of the average net profit of the Company to be spent every year during the three immediately preceding financial year towards CSR.
- vi) Construction work is yet to be started due to non-availability of funds. The project has been declared as a "National project" on 26.02.2009. A sum of Rs. 686.80 crores has been received from Govt. of Haryana, Govt. of Delhi and Govt. of India, of which Rs. 583.11 crores has been spent till date.
- vii) Among other conditions of environmental clearance, the PP agreed to comply to release 23 cumecs of water during lean season, Rs. 13.68

- crores (partly) has been released towards implementation of CAT Plan, R&R is being implemented as per the policy, etc.
- viii) An area of 813.57 ha of private land has already been acquired. A total of 25 Gram Panchayats are affected due to this project which includes 2,462 Nos. of project affected families.
  - ix) The additional land acquired shall be put to beneficial use (viz., industrial development, Agricultural activities, etc.) for the people around in general and project affected people in particular, or else it will be encroached upon.

After detailed deliberations as per the presentation including the facts presented by the PP, **the Committee recommended for increase of land requirement of the project** from 1477.78 ha (as per EC granted) to 1988.27 ha based on the detailed investigation and survey and physical verification under Sections 6, 7 & 8 of Land Acquisition Act.

**Item No. 18.3 Morand-Ganjal Irrigation Project in Hosangabad district of Madhya Pradesh by M/s Narmada Valley Development Authority, Madhya Pradesh-For extension of time for submission of Forest Clearance Stage- I (File No. J-12011/43/2011-IA.I and Online No. IA/MP/RIV/25213/2011)**

Application for extension of submission of Stage-I forest clearance was submitted by the PP online on 20.08.2018. The PP i.e. Narmada Valley Development Authority (NVDA) made a presentation of the proposal and *inter-alia*, provided the following information with respect to submission of Stage-I forest clearance:

- i. Morand and Ganjal Complex project is a Major Irrigation Project and envisages construction of 2 dams, one across Morand River and another across Ganjal River to provide irrigation facility in 52,205 ha CCA in Hosangabad, Harda and Khandwa Districts of Madhya Pradesh including drinking water supply for command villages and Seoni-Malwa Town. Total land requirement for the project is 4,210.74 ha. Out of which 2,371.14 ha is forestland, 384.97 ha is government land and 1,454.63 ha is private land. Total submergence area is 3,033.92 ha. No National park/Wildlife Sanctuary/ Biosphere Reserve exist within 10 km radius of the project. The total estimated cost of the project is Rs. 2,585.76 Crores.
- ii. The proposal was last considered by EAC in its meeting held during 2-3<sup>rd</sup> March, 2017. The EAC had recommended for grant of the Environmental Clearance (EC) for Morand-Ganjal Irrigation Project. The Ministry vide letter No. J-12011/43/2011-IA-I dated 10.04.2017, requested to submit a copy of Stage-I Forest Clearance at the earliest to enable to process the recommendations of EAC with respect to grant of EC.
- iii. FC Stage-I couldn't be submitted in time as per the notification dated 09.09.2011, therefore, it has been requested vide Applications dated 13.02.2018, 03.04.2018 and 25.06.2018 to allow to submit FC Stage-I

for another six months i.e. beyond 09.04.2018. Further, it has been submitted that now submission of FC Stage-I is not possible within six months also, the EAC may not consider the proposal as *de-novo* as per OM dated 18.05.2012.

The EAC deliberated the proposal based on the facts presented by the PP and noted that the Project Proponent couldn't be submitted a copy of FC Stage-I to process the recommendations of EAC for grant of environmental clearance. This might have been caused due to delay in the process of forest clearance. Further it has been noted that it is an irrigation project and being an national importance for food security of the country, the proposal may not be treated as *de-novo* and **opined that FC Stage-I may be submitted as early as possible to enable the Ministry to process the recommendations of EAC with respect to grant of EC.**

**Item No. 15.4 Ashti Lift Irrigation Scheme-III at district Beed, Maharashtra by M/s Water Resource Department, Govt. of Maharashtra, Aurangabad, Maharashtra – For fresh Environmental Clearance. (File No. J-12011/14/2015-IA.I & Online No. IA/MH/RIV/28875/2011)**

The Member Secretary informed the EAC that vide Ministry's letter dated 14.08.2018, Ashti Lift Irrigation Scheme III (Ashti LIS-III) in Beed District of Maharashtra is having culturable command area (CCA) of less than 50,000 ha, which is now to be considered in the State level by SEIAA, Maharashtra.

2. As per the records available in the Ministry, the following are noted:
  - i. Krishna Marathawada Lift Irrigation Project in Osmanabad involves lifting of 21 TMC of water from existing Ujjani Reservoir (acting enroute reservoir) and 2.66 TMC water from Bhima Sub-basin to provide irrigation facility in Marathawada Region in 87,188 ha CCA of area. LIS-1 proposes to utilize water in 5 stages from Ujjani Reservoir. LIS-II proposes to divert 10.41 TMC water through Bhima Sina Link existing tunnel. Remaining 2.66 TMC water is to be utilized from free catchment below Sina Kolegaon project up to Ghatne Barrage on Sina River. The GCA is 1,36,431 ha, the CCA is 1,08,985 ha and irrigable command area (ICA) is 87,188 ha.
  - ii. Administrative approval for the above scheme was granted by Government of Maharashtra vide Resolution No.2004/1413 (385/04) (Marathi Language) dated 23.08.2007 for an estimated amount of Rs. 2,382.50 crores for 19 TMC of surplus water availability in Krishna Basin.
  - iii. The project subsequently got revised and was approved by the Government of Maharashtra vide letter dated 27.08.2009 for an amount of Rs.4,845.05 crores for utilization of 23.66 TMC of surplus water in Krishna Sub-basin. The project was planned to irrigate 1,14,731 ha in Osmanabad and Beed Districts by 3 lift irrigation schemes i.e. LIS-I, LIS-II and Ashti LIS-III.

- iv. Out of 23.66 TMC of water, 17.9 TMC of water proposed to be utilized in Osmanabad District having 2 lift irrigation schemes and 5.68 TMC to be utilized in Beed District having only one lift irrigation scheme.
- v. The PP has applied the present proposal as a separate project, however vide letter dated 03.10.2015, PP requested the Ministry to reconsider the present proposal as an integral part of Krishna Marathawada Irrigation Project. However, the EAC while appraising this proposal, de-linked the Ashti LIS-III and recommended for grant of EC to Krishna Marathawada Irrigation Project i.e. for two lift irrigation schemes. Subsequently, the recommendation of the EAC was approved by the Competent Authority and the Ministry issued EC vide letter dated 13.08.2015.
- vi. During the process of appraisal, the EAC noted that a violation has occurred in the project and EAC mentioned that the extant procedure may be followed in the Ministry to deal with such violation cases. The EAC was further informed that such cases are separately to be dealt as per the OM Nos. J-11013/41/2006-IA-II (I) dated 12.12.2012 and 27.6.2013 in conjunction with orders of National Green Tribunal.
- vii. While appraising the proposal of Krishna Marathawada Irrigation project, the EAC noted that the construction works of Krishna Marathawada Irrigation Scheme including Ashti LIS-III have already been started. In this regards, the PP informed that as this project was given one administrative approval with LIS-I and LIS-II by the Government of Maharashtra, the construction works have started for Ashti LIS-III also.
- viii. Accordingly, the Ministry issued letters to PP and Department of Environment, Government of Maharashtra. The PP vide letter No. CE(WR)Abad/T-6/Camp/Delhi dated 27.10.2015 mentioned that Ashti-III was part of Krishna Marathawada Irrigation project. At that time, the work of Ashti LIS-III was taken up. Subsequently, the work was stopped along with LIS-I and LIS-II.
- ix. The NGT Order on violation committed/occurred in the project has been stayed by Hon'ble Supreme Court in September, 2015. Therefore, Ashti LIS-III was considered.
- x. The PP applied vide letter dated 03.10.2015, 27.10.2015 and 24.11.2015, for grant of a separate ToR for Ashti LIS-III in Beed district. The proposal of Ashti LIS-III is to utilize 5.68 TMC of water from Ujjani reservoir in 5 stages for providing irrigation facility in 27,543 ha, the GCA is 52,662 ha and the CCA is 35,647 ha. There is no national park/wildlife sanctuary/biosphere reserve/historical monument present in the project area, so General Condition is not applicable. Total estimated cost of the project is about Rs. 1,046 crores. The ToR was accorded on 10.12.2015 for collection of base line data and preparation of EIA/EMP report.

3. As the present proposal applied online as a separate proposal, but now, it is to be linked with Krishna Marathawada Irrigation project as per the revised Administrative Approval as one proposal only, i.e. LIS-I, LIS-II and Ashti LIS-III. During the EAC meeting, it has been opined that release of funds to Ashti LIS-III would be difficult if, EC is granted to this project separately, i.e. as a separate project other than LIS-I and LIS-II. Therefore, the PP shall again request the

Ministry for amendment of ToR of Ashti LIS-III stating that it is an integral proposal of Krishna Marathawada Irrigation Scheme. The irrigation technology use for all the above cases are same. Therefore, the Notification dated 14.08.2018 is not applicable.

4. After detailed deliberation, the EAC opined that the case will be considered in the next EAC meeting to decide the applicability of EIA Notification, 2006 and amendments thereof, **whether the present proposal as per the above Notification be appraised at the State Level or ToR to be amended so that the proposal can be appraised at the Central level, accordingly the proposal has been deferred. Before that the PP will provide a detailed write up on the project along with supporting documents.**

**Item No. 18.5 Proposal for construction of a New Dam at Mullaperiyar to replace the existing old Mullaperiyar dam, at Periyar village, Peerumedu tehsil, Idukki district, Kerala state by M/s Irrigation Department, Govt. of Kerala-For Fresh Terms of Reference (ToR) (File No. J-12011/22/2018-IA.I (R) & Online No. IA/KL/RIV/76421/2018)**

The Project Proponent (PP) and the Consultant, M/s Pragati Labs & Technologies Pvt. Ltd, made a presentation of the project and *inter-alia*, provided the following information:

- i. The existing Mullaperiyar dam on Periyar river is in Idduki District of Kerala. It is about 123 years old. The existing dam is a composite gravity structure with an inner hearting portion of about 62% of the total volume constructed of lime Surkhi concrete materials. Heavy and continuous seepage of water started appearing right from the first filling of the reservoir. Measures like grouting the body of the dam were resorted to check the seepages from 1935 and 1961. Continuous leaching out of the lime from the structure was also observed. In spite of strengthening measures the dam did not gain the adequate strength to function further.
- ii. The proposed Mullaperiyar dam across Periyar river is straight gravity structure which is proposed to be constructed about 366 m downstream of the existing dam. The project envisages construction of 45.50 m high dam. The additional land requirement is about 50 ha which is forest land. Additional submergence area is about 22.23 ha. The existing project as well as proposed new project falls in the Periyar Tiger Reserve area. Due to this proposal, one village is affected. The total estimated cost of the project is about Rs. 663 crores and it will be completed in 4 years.
- iii. The project proponent informed that since the proposed project is located inside Periyar Tiger Reserve area and interstate boundary with Tamil Nadu, this project falls under Category 'A'. Hence, the project has been submitted to the Central Level as per General Conditions of EIA Notification, 2006. The Administrative sanction by the Government of Kerala for carrying out EIA study of proposed proposal. The project proponent also intimated the EAC

that since the proposed project is located inside the Periyar Tiger Reserve, application to obtain clearance from NBWL has already been made.

The project proponent intimated the EAC that in view of the recent development and severe floods in Kerala State, the Government is keen to conduct the studies on the proposed project in order to know the present situation. The PP also mentioned that in the recent emergency meeting of Subcommittee of national Executive Committee (NEC), MoWR, RD & GR, New Delhi held on 27.8.2018, it was mentioned that the dam safety issues are settled by the empowered committee and the technical parameters regarding dam and antecedent conditions considered by the committee from the base line for future conditions rather than any number of studies earlier than that.

Hence, the proposal submitted to the Ministry for scoping / TOR clearance for conducting the studies at the proposed project site. The details of the proposed project are as follows:

- New Mullaperiyar dam is proposed across Periyar river which is 366 m downstream of the existing dam. The project envisages construction of 53.22 m high dam. Total land requirement is about 50 ha which is forest land. Total submergence area is about 22.23 ha. Total catchment area is about 624.50 km<sup>2</sup>. The gross storage at FRL is 321.48 MCM (i.e. 11,353 Mcft including 143 Mcft, additional storage due to new dam). The gross storage at MDDL is 146.46 MCM (i.e. 5,172 Mcft including 80 Mcft, additional storage due to new dam). The live storage at FRL is 175.02 MCM. The existing project as well as proposed new project is within the Periyar Tiger Reserve. Interstate boundary (Tamil Nadu & Kerala) also falls in within 10 km of the project area. No coastal zone found within 10 km of the project area. One village is to be affected by this project. The total estimated cost of the project is about Rs. 663 crores and it will be completed in 4 years.

The project proponent mentioned that they will collect the baseline data and carry out the study which will give a comprehensive picture presently existing at the dam site. Hence they requested the EAC to allow and permit the study and issue scoping/TOR clearance.

EAC observed that collecting data and study is minimum requirement for taking up any project and it cannot be denied. The EAC deliberated on the issue and recommended for grant of ToR of the proposed project with the following additional conditions:

- i. As per the ruling of the Hon'ble Supreme Court, in its judgement dated May 7, 2014, liberty has been granted to the parties to apply to the Court if they are or unable to arrive at some amicable solution regarding the new dam. Therefore, mutual consent/amicable solution passed in this regard should be submitted while applying for environmental clearance.
- ii. A WP (MD) No.14190/2001 case filed by TNPWD Senior Engineer Association v/s Home Secretary, Ministry of Home Affairs in the High

Court of Judicature at Madras (Special Original Jurisdiction), at Madurai Bench. The order in this regard be made available at the time of environmental clearance.

- iii. It is clarified that simply giving the scoping/ToR clearance to this project does not necessarily mean that the project is eligible for getting environmental clearance.
- iv. All statutory/necessary clearance should have to be obtained before submitting application for environmental clearance.
- v. Grant of ToR is subjected to any direction given by Hon'ble Supreme Court or NGT.
- vi. The findings of Dr Thatte Committee's report in respect of stability of dam shall be submitted.
- vii. The old dam and the submergence area is fully in the control of Govt. of Tamilnadu for the purpose of operation and use of water stored. Their prior consent for base data collection for preparation of EIA/EMP report, etc., is necessary.

**Item No. 18.6 Myntdu Leshka Stage-II HEP (210 MW) in West Jaintia Hills of Meghalaya by Meghalaya State Electricity Board – for Scoping/TOR. (File No. J-12011/13/2018-IA.I(R) & Online No. IA/ML/RIV/74834/2018)**

The Expert Appraisal Committee (EAC) considered the project in the meeting held on 28.06.2018 and observed the following:

- i. At least three alternates (including the present one) of the proposed sites be submitted to ensure the best viability of the project.
- ii. The working table for utilization of the water availability for the project based on the total sum average for the last 10 years (from 2004-05 to 2014-15) was not proper. The water availability is based on 10-daily water discharges corresponding to 90% dependable year showing the intercepted discharge at the barrage/dam. The committee observed that a detailed table depicting hydrology for the last 10 years be prepared and presented. The annual rain fall may also be presented for getting a clear idea of the hydrology.
- iii. The free flow stretches between Myntdu Leshka Stage-I and this project is about 0.63 km only and this is not as per the norms of maintaining 1 km minimum distance between two consecutive projects. The project is located at deep gorges and no suitable area to shift the dam axis and other are possible. In order to get a clear picture of the project area, a detailed map showing the upstream and downstream project be provided along with the L-Section and the bed slope of the river.
- iv. It has also been noted that environmental flow of 5% of average of river discharge during monsoon period and 2.5% of average river discharge during lean period have been proposed and this is also not as per the norms. Therefore, norms for release of Environmental flows, i.e. 30% in monsoon season, 20% in lean season and 25% in non-monsoon & non-lean season corresponding to 90% dependable year to be followed.

- v. PP presented that the project area to be covered within 7 km radius of the project. Therefore, to know the present status of environmental conditions in the area, baseline data with respect to environmental components viz., air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socio-economic status, etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site.
- vi. pH value of the river water is stated to be around 4.2. Therefore, it has been suggested that in addition to the pH value of the river water at the dam axis location, two more locations (upstream and downstream) be selected and pH values be measured for at least one month (preferable during lean season) to ensure the suitability of the proposed project and data be submitted to the Ministry for consideration before the EAC.

After detailed deliberations, the EAC recommended for a site visit by a sub-committee and after getting the site visit report on the above observation, the Ministry may further reconsider this project for scoping/TOR clearance.

The Sub Committee was constituted vide Ministry letter No. J-12011/13/2018-IA-I dated 19.07.2018 having the following Expert Members:

|       |                    |   |                  |
|-------|--------------------|---|------------------|
| (i)   | Dr. S.R. Yadav     | - | Chairman         |
| (ii)  | Shri Sharvan Kumar | - | Member           |
| (iii) | Shri N.N. Rai      | - | Member           |
| (iv)  | Dr. S. Kerketta    | - | Member Secretary |

It has also been opined that a Scientist from the RO, MoEF & CC, Shillong would also be included in the site visit along with the sub-committee. The Sub Committee visited the area around Myntdu Leshka HEP in Meghalaya from 16<sup>th</sup> to 19<sup>th</sup> August, 2018. Although, Shri Sharvan Kumar could not make it up with the team due to preoccupation, the other members visited the area. Dr. Val Saio, Scientist 'C' from RO, NER, MoEF&CC accompanied the team. The Sub-committee submitted the following (A site visit report of the Sub-committee is **Annexed**).

### **Background of the Project:**

Myntdu Leshka Stage-II HEP (210 MW) is proposed on Myntdu River in West Jaintia Hills District of Meghalaya by M/s Meghalaya Power Generation Corporation Limited. The project envisages construction of 44 m high concrete gravity across Myntdu River near village Trangbland for hydropower development with an Installed Capacity (IC) of 210 MW. This is an R-O-R scheme.

The catchment area of the project is 480 km<sup>2</sup>. The total land requirement for the project is about 1,000 ha. Total submergence area is about 140 ha. Project envisages a live storage of 2.93 million m<sup>3</sup> with a FRL at EL 270 m and MDDL at 253 m. The tailrace water level is at an elevation of 13 m to release water back to the river. The water will be diverted through 6.257 km long, 6 m dia. horse-shoe shaped Head Race Tunnel (HRT) to a surface powerhouse. A surface powerhouse

is envisaged with 3 units of 70 MW capacity each. This project is located at lowest most position of the Leshka river and the tailrace water goes to Bangladesh. The total cost of the project is Rs. 2881.19 Crores and proposed to be completed in 6 years after the zero date is established.

The studies for assessment of power benefits have been carried-out for hydrological years from 2004-05 to 2014-15. The maximum, minimum and average annual flows observed are to be 2914.44 MCM, 1668.71 MCM and 2290.85 MCM, respectively. The total design discharge would be 99.62 cumecs for all the three units. The water availability series for the project has been taken as total sum average of water for calculating the average flow during the last 10 years and not as 10 daily series in 90% dependable year.

### **Observation of the EAC**

The project was appraised by the EAC in its meeting held on 28.06.2018, wherein the EAC observed the following:

- i. At least three alternates (including the present one) of the proposed sites be submitted to ensure the best viability of the project.
- ii. The working table for utilization of the water availability for the project based on the total sum average for the last 10 years (from 2004-05 to 2014-15) was not proper. The water availability is based on 10-daily water discharges corresponding to 90% dependable year showing the intercepted discharge at the barrage/dam. Therefore, the committee observed that a detailed table depicting hydrology for the last 10 years be prepared and presented. The annual rain fall may also be presented for getting a clear idea of the project.
- iii. The free flow stretches between Myntdu Leshka Stage-I and this project is about 0.63 km only and this is not as per the norms of maintaining 1 km minimum distance between 2 consecutive projects. The project is located at deep gorges and no suitable area to shift the dam axis and other are possible. In order to get a clear picture of the project area, a detailed map showing the upstream and downstream project be provided along with the L-Section and the bed slope of the river.
- iv. pH value of the river water is stated to be around 4.2. Therefore, it has been suggested that including the pH value of the river water at the dam axis location, two more locations (upstream and downstream) be selected and pH values be measured for at least one month (preferable during lean season) to ensure the suitability of the proposed project and submitted to the Ministry for consideration before the EAC.

### **Observation and recommendations of the sub-Committee**

#### **Point 1**

At least three alternates (including the present one) of the proposed sites be submitted to ensure the best viability of the project.

**Observation:**

PP explained that, three alternatives (including the present one) have been examined to ensure the best viability of the project as directed. The other two alternatives of Dam site selected are at 180m and 507 m downstream of the present proposed dam site.

Cross sections at the dam axis for the other two alternatives have been developed as shown in Drawing No. MLHEP-II/ALT-DAM/2018/1/1. In order to obtain a free flow stretch of 1 km, as per environmental norms, the FRL has to be maintained at least 262 m height. At chainage 180 m (alternative II) downstream of the proposed dam site, the cross section developed is very narrow and cannot accommodate 8 nos. of spillway with openings of 8x 13.10 m, to pass the design flood of 10,400 cumecs. Another Damsite at chainage 507 m (alternative III) which seems feasible was examined. However, at FRL of 262 m, the topography does not allow the flood water of 10,400 cumecs to pass through. Therefore, it is felt that the original dam site (Alternative I) with FRL at 270m is the best option for which the flood of 10,400 cumecs can be regulated through 7 Nos. of gate with sluice opening of 8.4x15.50m. This site was also agreed upon by the CWC, New Delhi and GSI during their previous site visits.

**Point Nos. 2 to 4**

(2) A detailed table depicting hydrology for the past 10 years, (3) Free flow stretches between Myntdu Leshka Stage-I and Stage-II is about 0.63 km, a detailed map showing the upstream and downstream project be provided along with the L section and the bed slopes of the river.

(4) Norms for release of Environmental flows, i.e. 30% in monsoon season, 20% in lean season and 25% in non-monsoon and non-lean season corresponding to 90% dependable year, area to be followed and the results be submitted.

**Observation:**

**Water availability for Myntdu Leshka -II**

Myntdu Leshka HE Project-II lies in very high rainfall area of Meghalaya. The project site is about 60 km south west of Mawsynram, the place of highest rainfall in India. The average annual rainfall in the project catchment is about 5,500 mm. The drainage area of river at the proposed project site is about 480 km<sup>2</sup>. The average annual yield at project site from the water availability series approved by CWC is about 4,772 mm. The corresponding runoff coefficient is about 0.87. Considering the steep terrain and high rainfall in the catchment, the

yield estimated by CWC may be considered generally in order. The approved water availability series by CWC, is corresponding to the years 2004-05 to 2014-15. The flow statistics of the water availability series is as under:

| <b>Month</b>        | <b>Average discharge for the period 2004-05 to 2014-15</b> | <b>Discharge of 92% dependable year</b> | <b>Discharge of 83% dependable year</b> |
|---------------------|--|---|---|
|                     | (m <sup>3</sup> /s)  | (m <sup>3</sup> /s)                     | (m <sup>3</sup> /s)                     |
| June                | 188.69   | 121.20                                  | 179.27                                  |
| July                | 206.13   | 129.63                                  | 167.46                                  |
| August              | 160.32   | 116.49                                  | 123.96                                  |
| September           | 117.22   | 111.96                                  | 72.18                                   |
| October             | 46.98  | 29.39                                   | 12.17                                   |
| November            | 14.22  | 6.66                                    | 17.44                                   |
| December            | 10.40  | 3.91                                    | 14.20                                   |
| January             | 7.88   | 2.98                                    | 11.78                                   |
| February            | 8.78   | 5.59                                    | 10.85                                   |
| March               | 13.84  | 2.64                                    | 10.71                                   |
| April               | 26.84  | 2.34                                    | 41.21                                   |
| May                 | 66.57  | 101.08                                  | 39.28                                   |
| <b>Annual (MCM)</b> | <b>2291</b>  | <b>1669</b>                             | <b>1834</b>                             |

### **Environmental flow**

Due to acidic nature of water, fishes are not available in the river reach. In view of that environment flow during the leanest four months may be considered as 20% of the average flow of (Dec to March) of 90% dependable year. For the monsoon months (June to September) flow corresponding to a depth of at least 1m in the river reach between dam site and TRT outfall may be considered as environment flow for monsoon months. For non-monsoon non-lean months (Oct, Nov, Apr and May) flow corresponding to minimum depth of 60 cm in the river reach between dam site and TRT outfall, may be considered as environmental flow. The above flow requirements should be estimated on the basis of hydro-dynamic simulations using the cross sections of river between dam site and TRT outfall.

### **Minimum distance between TRT outfall of Myntdu Leshka HEP-I and pondage tip of Myntdu Leshka -II**

The reach of river between TRT outfall of Myntdu Leshka-I and pondage tip of proposed Myntdu Leshka-II is quite steep with slope being of the order of 1:40. During the site visit of the Sub-committee, a very rapid flow has been observed downstream of TRT outfall of Myntdu Leshka-I. Some site photographs of flow conditions in the river reach downstream of TRT outfall of Myntdu Leshka-I are shown as below:

1. In view of rapid flow due to steep slope in the river reach between TRT outfall of Myntdu Leshka-I and pondage tip of proposed Myntdu Leshka-II, the minimum distance requirement of 1km between TRT outfall of Myntdu Leshka HEP-I and pondage tip of proposed Myntdu Leshka-II, may not be necessitated due to adequate DO contents in the water.
2. Regarding the acidic nature of the water, it was suggested that rivulets draining the coal mining area upstream be identified and measures for its treatment with lime at source itself along with large scale campaign of awareness among the villagers/mining people be taken up. Special mention of these aspect be covered in the EIA and EMP of the project. Further, spring water be used for cooling of turbines. In similar situation, the Lower Kopili HEP by M/s APGCL, Assam has been accorded Environmental clearance as because there is another project located upstream of this proposed project which is operating with effective machine availability viz., Kopili HEP of M/s NEEPO. Considering the overall situations, the Sub Committee opined that the ToR for the Myntdu Leshka HEP Stage-II can now be accorded.

After detailed deliberations on the facts presented by the PP and the site visit report of the Sub-committee, **the EAC recommended for grant of ToR to the present proposal.**

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**Item No. 18.7 Any other items with the permission of the Chair**

As there being no agenda item left, the meeting ended with a vote of thanks to the Chair.

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(Dr. S. Kerketta)  
Member Secretary

(Dr. S.K. Jain)  
Chairman

## **Site visit report of the sub committee to the proposed Myntdu Leshka stage II HEP (210 MW) in West Jaintia Hills of Meghalaya by Meghalaya State Electricity Board**

In the 15<sup>th</sup> meeting of the re-constituted Expert Appraisal Committee for River Valley & Hydroelectric Projects was held on 28.06.2018. In the meeting, it was decided that a 4 Member Sub-Committee shall visit the proposed project site and to submit report on the viability of the project for appraisal before the next EAC meeting. The Sub Committee was constituted vide Ministry letter No. J-12011/13/2018-IA-I dated 19.07.2018 having the following Expert Members:

|        |                    |   |                  |
|--------|--------------------|---|------------------|
| (v)    | Dr. S.R. Yadav     | - | Chairman         |
| (vi)   | Shri Sharvan Kumar | - | Member           |
| (vii)  | Shri N.N. Rai      | - | Member           |
| (viii) | Dr. S. Kerketta    | - | Member Secretary |

It has also been opined that a Scientist from the RO, MoEF & CC, Shillong would also be included in the site visit along with the sub-committee.

The Sub Committee visited the area around Myntdu Leshka HEP in Meghalaya from 16<sup>th</sup> to 19<sup>th</sup> August, 2018. Although, Shri Sharvan Kumar could not make it up with the team due to preoccupation, the other members visited the area. Dr. Val Saio, Scientist 'C' from RO, NER, MoEF&CC accompanied the team.

The following Officials present from the Project Proponent:

### **Background of the Project:**

Myntdu Leshka Stage-II HEP (210 MW) is proposed on Myntdu River in West Jaintia Hills District of Meghalaya by Meghalaya Power Generation Corporation Limited. The project envisages construction of 44 m high concrete gravity across Myntdu River near village Trangbland for hydropower development with an Installed Capacity (IC) of 210 MW. This is an R-O-R scheme.

The catchment area of the project is 480 km<sup>2</sup>. The total land requirement for the project is about 1,000 ha. Total submergence area is about 140 ha. Project envisages a live storage of 2.93 million m<sup>3</sup> with a FRL at EL 270 m and MDDL at 253 m. The tailrace water level is at an elevation of 13 m to release water back to the river. The water will be diverted through 6.257 km long, 6 m dia. horse-shoe shaped Head Race Tunnel (HRT) to a surface powerhouse. A surface powerhouse is envisaged with 3 units of 70 MW capacity each. This project is located at lowest most position of the Leshka river and the tailrace water goes to Bangladesh. The total cost of the project is Rs. 2881.19 Crores and proposed to be completed in 6 years after the zero date is established.

The studies for assessment of power benefits have been carried-out for hydrological years from 2004-05 to 2014-15. The maximum, minimum and average annual flows observed are to be 2914.44 MCM, 1668.71 MCM and

2290.85 MCM, respectively. The total design discharge would be 99.62 cumecs for all the three units. The water availability series for the project has been taken as total sum average of water for calculating the average flow during the last 10 years and not as 10 daily series in 90% dependable year.

### **Observation of the EAC**

The project was appraised by the EAC in its meeting held on 28.06.2018, wherein the EAC observed the following:

- v. At least three alternates (including the present one) of the proposed sites be submitted to ensure the best viability of the project.
- vi. The working table for utilization of the water availability for the project based on the total sum average for the last 10 years (from 2004-05 to 2014-15) was not proper. The water availability is based on 10-daily water discharges corresponding to 90% dependable year showing the intercepted discharge at the barrage/dam. Therefore, the committee observed that a detailed table depicting hydrology for the last 10 years be prepared and presented. The annual rain fall may also be presented for getting a clear idea of the project.
- vii. The free flow stretches between Myntdu Leshka Stage-I and this project is about 0.63 km only and this is not as per the norms of maintaining 1 km minimum distance between 2 consecutive projects. The project is located at deep gorges and no suitable area to shift the dam axis and other are possible. In order to get a clear picture of the project area, a detailed map showing the upstream and downstream project be provided along with the L-Section and the bed slope of the river.
- viii. pH value of the river water is stated to be around 4.2. Therefore, it has been suggested that including the pH value of the river water at the dam axis location, two more locations (upstream and downstream) be selected and pH values be measured for at least one month (preferable during lean season) to ensure the suitability of the proposed project and submitted to the Ministry for consideration before the EAC.

The EAC sub-committee members shall ensure the viability of above observed points, during the visit

### **Visit of the Sub Committee:**

The Sub Committee visited the area around Myntdu Leshka HEP in Meghalaya from 16<sup>th</sup> to 19<sup>th</sup> August, 2018.

**Date: 17.08.2018**

The team traversed the area along Shillong – Jowai - Myntdu Leshka Stage-I HEP road in the West Jaintia Hills District of Meghalaya. The area is full of rugged and undulating terrains with the exception of the deep gorges, steep precipice

and narrow valleys carved out by the numerous rivers and a good number of turbulent streams. The district has good forest cover with rich flora and fauna.



Rugged terrain enroute to the Myntdu Leshka Hydro Project II

The Pitcher plants or *Nepenthes Khasiana*, the insect eating plants of Botanical wonder are found in plenty in and around Jarain area. Jarain Pitcher Plant lake is located in Jarain Village of Amlarem Civil Sub-Division about 19 kms from Jowai. It is centred around Pitcher Plant theme to attract attention of visitors to the Pitcher Plant which is not only unique to the area but also unjque for its carnivorous qualities.



Pitcher Plant Lake, Jerani



Pitcher Plants



Team members at Village Jarain

### **Myntdu Leshka Stage-I HEP**



View of the Myntdu Leshka HEP Stage-I Dam and Reservoir area



View of the Myntdu river downstream of the Myntdu Leshka HEP Stage-I.  
(From Orange Orchards)

Committee members had a small halt at dam top of Myntdu Leshka Stage-I HEP. The Chief Engineer, MPGC Ltd explained the salient features of the project. It was informed that fishing is being done in the reservoir of the project.

Further, on the top of the left bank of the river while approaching towards the Power house of the MLHEP, large number of Orange orchards with fully developed trees were seen. A stretch of the land along the road with large number of Pitcher Plants was again encountered.





**Few glimpses of the team visiting site enroute to MLHEP Power house from Dam site**

**Myntdu Leshka Power House Stage-I**



**View of the Tail race channel outlet meeting the Lynriang river**



**Downstream view of the river after joining the outlet of Tail Race Channel of Myntdu Leshka HEP and Lynriang river.**



### **The Team and the Officials of the Project**

#### **Observation and recommendations of the sub-Committee**

##### **Point 1**

At least three alternates (including the present one) of the proposed sites be submitted to ensure the best viability of the project.

##### **Observation:**

PP explained that, three alternatives (including the present one) have been examined to ensure the best viability of the project as directed. The other two alternatives of Dam site selected are at 180 m and 507 m downstream of the present proposed dam site.

Cross sections at the dam axis for the other two alternatives have been developed as shown in Drawing No. MLHEP-II/ALT-DAM/2018/1/1. In order to obtain a free flow stretch of 1 km, as per environmental norms, the FRL has to be maintained at least 262 m height. At chainage 180 m (alternative II) downstream of the proposed dam site, the cross section developed is very narrow and cannot accommodate 8 nos. of spillway with openings of 8x 13.10 m, to pass the design flood of 10,400 cumecs. Another Damsite at chainage 507 m (alternative III) which seems feasible was examined. However, at FRL of 262 m, the topography does not allow the flood water of 10,400 cumecs to pass through. Therefore, it is felt that the original dam site (Alternative I) with FRL at 270 m is the best option for which the flood of 10,400 cumecs can be regulated through 7 Nos. of gate with sluice opening of 8.4x15.50 m. This site was also agreed upon by the CWC, New Delhi and GSI during their previous site visits.

#### **Point Nos. 2 to 4**

(2) A detailed table depicting hydrology for the past 10 years, (3) Free flow stretches between Myntdu Leshka Stage-I and Stage-II is about 0.63 km, a detailed map showing the upstream and downstream project be provided along with the L section and the bed slopes of the river.

(4) Norms for release of Environmental flows, i.e. 30% in monsoon season, 20% in lean season and 25% in non-monsoon and non-lean season corresponding to 90% dependable year, area to be followed and the results be submitted.

#### **Observation:**

#### **Water availability for Myntdu Leska -II**

Myntdu Leska HE Project-II lies in very high rainfall area of Meghalaya. The project site is about 60 km south west of Mawsynram, the place of highest rainfall occurring in India. The average annual rainfall in the project catchment is about 5,500 mm. The drainage area of river at the proposed project site is about 480 km<sup>2</sup>. The average annual yield at project site from the water availability series approved by CWC is about 4,772 mm. The corresponding run off coefficient is about 0.87. Considering the steep terrain and high rainfall in the catchment, the yield estimated by CWC may be considered generally in order. The approved water availability series by CWC, is corresponding to the years 2004-05 to 2014-15. The flow statistics of the water availability series is as under:

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### **Environmental flow**

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### **Minimum distance between TRT outfall of Myntdu Leska HEP-I and pondage tip of of Myntdu Leska -II**

The reach of river between TRT outfall of Myntdu Leska-I and pondage tip of proposed Myntdu Leska-II is quite steep with slope being of the order of 1:40. During the site visit of the Sub-committee, a very rapid flow has been observed downstream of TRT outfall of Myntdu Leska-I. Some site photographs of flow conditions in the river reach downstream of TRT outfall of Myntdu Leska-I are shown at next page:



Rapid flow just d/s of TRT outfall of Myntdu Leska-I



Rapid flow about 200 m downstream of TRT outfall of Myntdu Leska-I

In view of rapid flow due to steep slope in the river reach between TRT outfall of Myntdu Leska-I and pondage tip of proposed Myntdu Leska-II, the minimum distance requirement of 1 km between TRT outfall of Myntdu Leska HEP-I and pondage tip of proposed Myntdu Leska-II, may not be necessiated due to adequate DO contents in the water.

Regarding the acidic nature of the water, it was suggested that rivulets draining the coal mining area upstream be identified and measures for its treatment with lime at source itself along with large scale campaign of awareness among the villagers/mining people be taken up. Special mention of these aspect be covered in the EIA and EMP of the project. Further, spring water be used for cooling of turbines. In similar situation, the Lower Kopili HEP by M/s APGCL, Assam has been accorded Environmental clearance as because there is another project located upstream of this proposed project which is operating with effective machine availability viz., Kopili HEP of M/s NEEPO.

Considering the overall situations, the Sub Committee opined that the ToR for the Myntdu Leshka HEP Stage-II can now be accorded.

**(Dr. Val Saio)**  
NERO, Shillong

**(Dr. S. KERKETTA)**  
Member Secretary

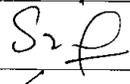
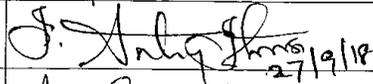
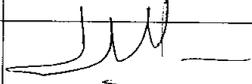
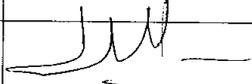
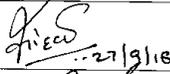
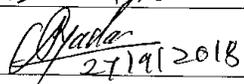
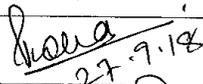
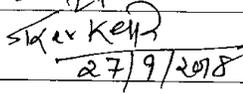
**(Shri N.N. Rai)**  
Member

**(Dr. S.R. Yadav)**  
Chairman

**LIST OF MEMBERS**

**18<sup>th</sup> MEETING OF RE-CONSTITUTED EXPERT APPRAISAL COMMITTEE (EAC) FOR  
RIVER VALLEY & HYDROELECTRIC PROJECTS**

**DATE** : 27<sup>th</sup> September 2018  
**TIME** : 10:30 am onwards  
**VENUE** : NARMADA HALL, INDIRA PARYAVARAN BHAWAN, NEW DELHI

| Sl.No. | Name of Member                                    | Signature  |
|--------|---|--|
| 1.     | Prof. Sharad Kumar Jain,<br>Chairman              |                       |
| 2.     | Shri. T. P. Singh<br>Member                       | abs  |
| 3.     | Shri. Sharvan Kumar,<br>Member                    |                       |
| 4.     | Shri N. N. Rai,<br>Member                         |                        |
| 5.     | Dr. J.A.Johnson,<br>Member                        | <br>27/9/18           |
| 6.     | Dr. AK Sahoo,<br>Member                           | <br>27.9.18           |
| 7.     | Dr. Vijay Kumar,<br>Member                        | abs  |
| 8.     | Prof. Govind Chakrapani,<br>Member                | G. J. Chakrapani<br> |
| 9.     | Dr. Chetan Pandit,<br>Member                      |                      |
| 10.    | Dr. Dinkar Madhavrao More,<br>Member              |                     |
| 11.    | Prof. R.K. Kohli,<br>Member                       | <br>27/9/18          |
| 12.    | Prof. S.R. Yadav,<br>Member                       | <br>27/9/2018        |
| 13.    | Dr. Jai Prakash Shukla,<br>Member                 | abs  |
| 14.    | Dr. Poonam Kumria,<br>Member                      | <br>27.9.18          |
| 15.    | Dr. Kerketta, Member Secretary<br>Director (IA-1) | <br>27/9/2018        |

**From:** navin chandra [mailto:navinchandrarrl@yahoo.com]

**Sent:** Thursday, October 4, 2018 4:52 PM

**To:** Dr S. Kerketta <s.kerketta66@gov.in>; Dr S. Kerketta <s.kerketta66@nic.in>; Dr S. Kerketta <sunamani1466@gmail.com>; Dr S. Kerketta <suna1466@rediffmail.com>; N. SUBRAHMANYAM <n.subrahmanyam@gov.in>; N. SUBRAHMANYAM <n.subrahmanyam@nic.in>

**Subject:** Approval of the EAC meeting held in September, 2018

04/10/2018

Dear Dr. Kerketta,

I have gone through the finalized draft minutes of the EAC (Thermal). The Minutes are in order and can be uploaded on the web site of MoEF&CC.

Regards,

(NAVIN CHANDRA)

-----  
Dr. Navin Chandra,

Director General

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Vigyan Bhawan, Nehru Nagar, Bhopal - 462003 (M.P.) India

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