भारत सरकार
Government of India
जल शक्ति मंत्रालय
Ministry of Jal Shakti
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
Department of WR, RD and GR
केन–बेतवा लिंक परियोजना प्राधिकरण
Ken Betwa Link Project Authority

No: NWDA/CE(N)LKO/T-16/KBLPA/3981-4003 **Date:29.09.2023**

Sub: Minutes of 6th Meeting of Technical Advisory Group of Ken Betwa Link Project Authority on 18.09.2023 at Khajuraho.

The 6th meeting of the Technical Advisory Group of Ken Betwa Link Project Authority (TAG-KBLPA) was held on 18.09.2023 at Khajuraho under the chairmanship of Shri D. P. Bhargava, Former Director (Technical), NHPC, Faridabad.

TAG also visited the Barua Sagar Dam, Parichha Weir, Bariyarpur PUW and Ken Canal system on 16.09.2023 and 17.09.2023.

Minutes of the meeting, duly approved by the Chairman (TAG), is enclosed for kind information and further necessary action by all concerned.

Shiva Prakash
29/09/2023

(Shiva Prakash)
ACEO (HQ/P), KBLPA

To: All the Members of TAG of KBLPA

1. Shri D. P. Bhargava, Former Director (Technical), NHPC, Faridabad
2. Shri Y. K. Handa, Former Chief Engineer, CWC
3. The Chief Engineer, Designs (NW&S), CWC, New Delhi
4. Shri V. K. Niranjan, Former HoD & E-in-C, I&WRD, UP
5. Shri G. P. Soni, Chief Engineer, Bodhi, WRD, MP
6. The Director (CSMRS), New Delhi
7. The Director, Hydrology-Central, CWC, New Delhi
8. The Chief Engineer (Research & Planning), I&WRD, Aligarh, Govt. of UP/ACEO (Design & Planning), KBLPA, UP.
9. The Additional CEO (Head Works)/(Canal), KBLPA

Copy for kind information to:

1. The Member, D&R, CWC, New Delhi
2. The Principal Secretary, WRD, Govt. of MP, Bhopal
3. The Principal Secretary, I&WRD, Govt. of UP, Lucknow
4. The Director (Finance), KBLPA, New Delhi.

Special Invitee: -

1. The Chief Executive Officer, KBLPA, New Delhi.
2. The Engineer-in-Chief, WRD, Govt. of MP, Bhopal
3. The Engineer-in-Chief (Projects), I&WRD, Govt. of UP, Lucknow
4. The Chief Engineer (HQ), NWDA, New Delhi
5. The Chief Engineer (Project Betwa)/ACEO(Construction), KBLP, I&WRD, Jhansi
6. The Superintending Engineer, KBLP, Banda/Mahoba
7. The Superintending Engineer, NWDA, Gwalior.
8. The Executive Engineer, KBLPA, Jhansi/ Bhopal

Minutes of 6th Meeting of Technical Advisory Group of Ken Betwa Link Project Authority held on 18.09.2023 at Khajuraho

The 6th meeting of Technical Advisory Group of Ken Betwa Link Project Authority (TAG-KBLPA) was held on 18.09.2023 at Khajuraho under the Chairmanship of Shri D. P. Bhargava, former Director (Technical), NHPC, Faridabad to discuss the various issues. The list of participants is attached at **Annexure-I.**

At the outset, Chairman welcomed all the participants. After the brief introduction of the participants, item-wise agenda was taken up for discussion. Prior to the TAG meeting, **TAG visited the Barua Sagar Dam, Parichha Weir, Bariyarpur PUW and Ken Canal system on 16.09.2023 and 17.09.2023**.

The details of discussion carried out and the points agreed upon are as under:-

1. Compliance to the decisions taken in 5th Meeting of TAG held on 25.07.2023:

5th meeting of the Technical Advisory Group of Ken Betwa Link Project Authority (TAG-KBLPA) was held on 25.07.2023 through video conferencing, in which some modifications were suggested in the tender document for the Daudhan Dam and Appurtenant Structures. It was informed that various suggestions/ decisions taken in the 5th meeting of TAG, have been incorporated suitably in the tender document of Daudhan dam and tender has been floated on 11th August, 2023.

The TAG suggested that for the purpose of arriving at the applicable O&M cost, on project completion, the escalation rate for O&M cost, as notified by the CERC, for tariff periods (next period would be April 24 –March 2029) on the base price of the eligible O&M cost may be used. The base price would be the percentage of the cost quoted in the bid .The base price would be escalated as per the CERC notified escalation rate till project completion to arrive at the applicable O&M cost.

2. Restoration of Ken Main Canal system:

TAG inspected the Ken Main Canal on 17.09.2023 and noted the dilapidated condition of the Ken Main Canal system and various structures on the canal such as canal falls, aqueducts, VRBs, regulators etc. where the interventions are required for repair/ restoration. Ken Main Canal system was further discussed in the TAG meeting and a presentation was given by the SE, KBLP, I&WRD, Banda, Govt. of Uttar Pradesh wherein he explained in detail the existing state of the canal system and requirements for repair/ renovation. Based on the detailed discussions, TAG recommended that: -

i) Present dilapidated condition of existing canal falls is the cause of the turbulence

in water flow leading to substantial erosion & damage of canal sections. TAG recommended the re-grading of the canal bed slope to prevent excessive flow velocities and that canal falls be properly designed and constructed with suitable transitions and d/s bed protection/ energy dissipating arrangements etc.

ii) Existing canal structures such as, falls, aqueducts, VRBs, regulators etc., which have been damaged, should be repaired / renovated/ modernized as per feasibility.

iii) Proposal submitted is for lining of entire length of Ken Main canal (59 Km), Atarra Branch canal (39 km), Banda Branch Canal (40Km), totaling 138 Km, and four distributaries (totaling 138 Km). Thus total 276 Km Canal lining has been proposed. TAG observed that lining of canal may not be needed in excavated reaches of canals. Lining may be done where major portion of the canal bank has been made through filling. The scope and the cost may be revised accordingly.

iv) The comparison between Cement Concrete lining and Stone pitching of canal should be made on the cost and suitability parameters & the better technoeconomic option be adopted.

v) For intervening drains across canal, inlets and outlets (for discharging the flood water) may be preferred as far as possible. The requirement of siphon at any place needs to be assessed properly and to be adopted only when no other option is feasible.

vi) The Detailed Project Report for Renovation and Modernization of Ken Main Canal System may be revised and the DPR may be prepared in three sections [(a) Ken main canal (b) Atarra Branch Canal & its distributaries and (c) Banda Branch Canal & its distributaries)] and thereafter a consolidated summary. These may be completed/ submitted within one month.

vii) The exact working season, based on canal running schedule, may be specified clearly in DPR to carry out the repair /renovation works so as to avoid cost and time over runs.

3. Strengthening and renovation of Bariyarpur PUW, Parichha Weir and Baruasagar Dam:

a. <u>Bariyarpur Pick Up Weir</u>

The TAG visited the Bariyarpur Pick Up Weir on 17/09/2023 to see its existing condition and the required intervention as regards its strengthening & renovation. The issue was further deliberated in the TAG meeting on 18/09/2023. During the meeting, officers of the I&WRD, Govt. of Uttar Pradesh informed that flood discharge at the weir site has exceeded the design flood of 5.20 lakh cusec several times in recent years. During the site visit, it has also come to the notice that sluice gates of the weir are not operational. Based on the detailed discussion during the site visit & the meeting, TAG suggested the following: -

i) Bathymetry survey may be carried out to estimate the latest storage capacity.

ii) CWC may be approached to carry out the design flood study.
iii) Redesigning of the head regulator and Canals.
iv) Since construction of piers for new gates would result in reduction of the waterway, it has been suggested to explore the alternative option of installation of a Rubber Dam in consultation with CWC. Possibility of operation of existing type of gates (after renovation/ modification) through gantry crane with some attachments may also be explored.
v) The State Government of Uttar Pradesh shall consult its mechanical workshop to explore the best suitable possibility for the mechanized operation of gates.
vi) Also, gate automation may be examined based on the experience and semi-automated type provision may be more practical and easier to implement.
vii) The leading gate manufacturers will be contacted to propose the best suitable arrangement for the replacement / modification of gates and its operation system through electric motors/ gantry crane.
viii) Operation of sluice gates should be modified to make it open /close through electric motor & gears. Operation of the gate should be set right and during flood season, it should be kept open to flush out maximum silt from the reservoir.

b. <u>Parichha Weir</u>

TAG inspected Parichha Weir on 16/09/2023 to see its present condition and to suggest measures for its strengthening/ renovation. After detailed deliberation during the visit & the subsequent meeting, TAG suggested the following:-

i) Replacement of the existing falling shutter-type gates with suitable vertical lift gates of size not more than 6 m, operated through rope drum type motorized hoist mechanism.
ii) Replacement/renovation of the existing sluice gates and its operating mechanism with rope drum type hoist mechanism through electric motor.
iii) Repair of the head regulator.
iv) CWC may be approached to carry out design flood study.
v) Suitable jacketing of the crest and the d/s side of the existing structure with cement concrete in consultation with CWC & CSMRS. It was informed that in the past, for around 3m width of the top existing stone masonry has been removed upto 1.2 m depth & has been replaced with cement concrete. Therefore, the top 1-1.2 m depth of the structure can again be removed & this shall be replaced with cement concrete to embed the new crest gates. Due consideration of the safety of the existing structure and quality control should be given during these activities.
vi) Additional spillway of suitable depth & width can be created to compensate the reduction in its waterway length due to the construction of the piers for Gates installation. These spillways can have sluice type of gates and can be used for silt flushing during flood season. Such sluice gates should be mechanized and can be placed at one meter lower than canal bed level.

vii) Instrumentation of the structure for monitoring and operation purposes.
viii) Low pressure grouting may be done, in consultation with CWC to arrest seepage said to be occurring at some points through the body of the weir.
ix) Bathymetry survey may be carried out to estimate the latest storage capacity

c. <u>Barua Sagar Dam</u>

TAG visited the Barua Sagar Dam on 16/09/2023 along with State Govt. officials. During the visit, the differential settlements in an old structure adjacent to the reservoir boundary and cracks in the masonry reservoir boundary were noticed. State Govt officers present in the meeting assured the TAG that such minor cracks will be repaired in due course as part of regular maintenance.

i) The lake is full of silt and capacity of the lake is greatly reduced. State Government may explore the possibility of silt removal arrangement for its capacity restoration.

ii) The trees planted adjacent to the reservoir boundary may be uprooted & planted at safe distance, in consultation with Forest Department/other agencies concerned as its roots may cause cracks in the reservoir boundary in future.

The meeting ended with vote of thanks to Chair and all the members present.

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Annexure-I

List of Participants of the 6th Meeting of Technical Advisory Group (TAG) of KBLPA held on 18.09.2023 at Khajuraho

S.No.	Name (Shri/Smt.) & Designation
1	Shri D.P. Bhargava, Former Director (Tech), NHPC -Chairman, TAG
2	Shri V.K. Niranjan, Former HoD & E-in-C, I&WRD, UP -Member
3	Dr. Manish Gupta, Scientist-E, CSMRS, New Delhi-Member
Special Invitees	
1	Shri Bhopal Singh, CEO, KBLPA & DG, NWDA, New Delhi
2	Shri D.K. Mishra, Superintending Engineer, KBLCC-1, Mahoba
3	Shri Sandeep Kumar Khare, Superintending Engineer, KBLCC-2, Banda
Other Officers	
1	Shri A.K. Madhok, SE, NWDA, Gwalior
2	Shri Arvind Kumar Sachan, EE, KBLCC-1, Jhansi
3	Shri Ashish Singh Kushwah, EE, KBLPA, Jhansi
4	Shri Jitendra Kumar, EE, KBLCCD-2, Banda
5	Shri Ravindra Kumar Verma, EE, KBLCD-2, Lucknow
6	Shri Mayank Raj Singh, EE, KBLCCD-2, Mahoba
7	Shri Rajnath Singh, EE, KBLCC-1, Banda
8	Shri Anshul Jain, AE, KBLPA, Jhansi
9	Shri Ashish Swami, AE, KBLPA, Jhansi
10	Shri Prashant Kumar, AE, NWDA, IC, Gwalior
11	Shri Nihit Kumar Singh, AE, KBLCCD-2, Banda
12	Shri Dev Vrat Verma, AE, KBLCDC, Lucknow
13	Shri Abhishek Kumar Adarsh, AE, KBLCDC, Lucknow
14	Shri Vinay Mishra, AE, KBLCC-1, Jhansi
15	Shri Gaurav Choudhary, AE, KBLCC-2, Banda
16	Shri Sikander Khan, AE, KBLCCD-2, Banda
17	Shri Amit Tiwari, JE, KBLPA, Jhansi
18	Shri Ram Singh Meena, JE, KBLPA, Jhansi
19	Shri Bimlesh Goswami, Draftsman Gr-II, KBLPA, Jhansi