Guidelines for
Small Hydro Project Development in West Bengal

Introduction:

The existing policies in national level define Small Hydro Project (SHP) as projects having proposed installed capacity of 25 MW or less. The Ministry of New and Renewable Energy (MNRE), Govt. of India is the nodal Ministry which formulates schemes to support development of SHPs through grant of Central Financial Assistance (CFA) with participation from State as well as Private Sectors. The schemes generally encompass the followings:

(i) Resource Assessment by the State Govt. Depts./Agencies/ Local Bodies in the Govt. Sectors, which includes identification of new potential sites, preparation of Plan and Detailed Project Report (DPR).

(ii) Implementation of the Projects will be done through the State Governments departments, State Power Utilities, State Nodal Agencies, Private Developers, Individual Entrepreneurs, Tea Gardens, NGOs, Water Mill Associations, Academic and Financial Institutions/Banks etc. based on the proposals furnished as indicated under individual schemes of the Ministry.

(iii) The proposals by the Implementing Agencies/Developers should be in the format prescribed by MNRE, GoI for individual schemes.

According to the present policy of Govt. of India, proposals for development of new Hydro Power Projects within the state having estimated project cost up to Rs.1000Cr. require prior approval of the State Government.

The existing Schemes also mention that the PFRs/ DPRs should be prepared as per relevant standards/ practices issued by AHEC/CEA/CWC for Small Hydro Project Development.

Need of guideline:

At present two guidelines are available for development of Small Hydroelectric Projects. One is a "Manual on Development of Small Hydroelectric Projects" by the Central Board of Irrigation & Power (Published in 2009) and the other is "Standards/ Manuals / Guidelines for Small Hydro Development" by Alternate Hydro Energy Center, Indian Institute of Technology, Roorkee (Published in 2012).

These guidelines provide broad based guidance for preparation of Detailed Project Report towards implementation of Small Hydro Projects covering site specific needs. While dealing with Private Developers' projects in the State, it is being observed that Private Sectors are evincing interest in

developing of Small Hydroelectric Projects but they are not as yet equipped with necessary experience and expertise. Some initial investment would be required for Survey & Investigation activities and for engagement of Consultant for preparation of DPR. They are also facing hardship in acquiring requisite data for resource assessment and also in finalizing project land. As a result, the process of project development is being carried out in a very slow pace.

In order to expedite the process, it is being felt that some site specific action plan is required for assessment of initial feasibility/ PFR and subsequent preparation of DPR of the project by the Project Proponent. Accordingly, some activities have been extracted from the available Guidelines for formulation of PFR/DPR of Small Hydro Schemes to offset the ground level issues, their Acceptance and Examination for Concurrence towards development of SHPs in the State and furnished here under.

A. Guidelines for Preparation of DPR

The following activities shall have to be performed by the project proponent during preparation of the DPR and submission to WBSEDCL for approval.

1. **Topographical Survey:-**

   General Layout Plan, L Section along the Stream/ River Cross Sections, Plan & Sectional view of different structures shall be done as per AHEC/CBIP Guidelines for Small Hydro Development.

2. **Geology:-**

   i. Geological mapping of project area shall be done based on surface observations engaging expert Geologists and overlaid on the project topographical survey drawings.

   ii. In normal condition, subsurface geotechnical exploration i.e. drilling holes / pits for different major project components may be limited to the following extent:

      a. Weir axis, Forebay and Power House location: - at least one at each locations.

      b. Barrage axis: - Three nos., one each at both left and right abutment and one at central point.

      c. Tunnel alignment: - Three nos., one each at entry portal, exit portal and central point/low cover reaches.

   Depth of Drill holes/pits may be in accordance with the AHEC/CBIP Guidelines.

   iii. In case, Geological features like faults, shear zones, open cracks, landslides etc. are encountered during geological survey of the proposed area then detail subsurface

investigations of the area may be carried out as per AHEC/CBIP Guidelines for Small Hydro Development and subsequent observations by the Appropriate Authority during the process.

3. **Hydrology: -**

Water availability assessment is to be done by either of the following methods:

i. Collection of available reliable historical discharge data from nearby discharge measuring site and transposing the same to the project site by appropriate method.

ii. From rainfall-runoff correlation with the help of a common period of minimum two lean season and one monsoon season of rainfall and runoff data and transposing the same to the project site by appropriate method. Rainfall data may be collected from Indian Meteorological Department or any reliable sources.

The length of the derived discharge series in both the above cases should not be less than 10 years and as recent as practicable.

Additionally, river/ jhora/ nala discharge may be measured near the proposed intake site location during the process of PFR/ DPR preparation for a minimum period of two lean and one monsoon season for necessary consistency checks and Project hydrology may be carried out accordingly, as per AHEC/CBIP guidelines.

4. **Power Potential Study:-**

Power Potential study shall be done based on 75% dependable year and release of Environmental & other flows as per stipulations.

5. **Rehabilitation & Resettlement (R & R) Issues: -**

The Project Proponent shall give undertakings regarding R & R issues if any within proposed project area, to resolve the matter involving local Administrations as per prevailing Act. In case, there is no R & R issues observed during project Survey & Investigations, it should be clearly mentioned in the DPR.

6. **Environmental/Statutory Clearances: -**

The Project Proponent shall give undertakings about obtaining Environmental and/or any other Statutory Clearances as deemed required as per prevailing Act, prior to start of project construction activities.

7. **Design of Civil Structure & Hydro Mechanical Equipment**

Hydraulic Design of all civil structure & Hydro mechanical structures shall be carried out according to AHEC/CBIP guidelines.

8. **Design of Electro Mechanical Equipment:-**

To be done as per AHEC/CBIP guidelines.

9. **Power Evacuation:**

A power evacuation scheme containing following information shall be submitted.

i. Single Line Diagram of the SHP mentioning all items / equipment details.

ii. Nearby WBSEDCL substation name, location and approximate distance from the proposed SHEP Switchyard.

10. **Cost Estimates:-**

i. Cost estimate is to be prepared as per 'Guidelines for Formulation of Detailed Project Reports for Hydro Electric Schemes, their Acceptance and Examination for Concurrence' of CEA.

ii. Rates are to be considered from the latest WBPWD Schedule of Rates (Electrical and Civil) / WBSEDCL's Schedule of Rates for electrical work and where the items are not available in the SOR, rate analysis is required to be carried out.

iii. Cost Estimates for Power Evacuation Line has to be prepared following WBERC Guidelines.

11. **Economic evaluation:-**

i. Project cost & IDC is to be calculated considering the MNRE or any other grant as applicable.

ii. Levellised tariff and Levellised Cost are to be calculated as per the latest CERC and WBERC guidelines separately.

B. Approval Process:

A 'two stage' approval process consisting of (i) In-principle Approval and (ii) Final Approval has been considered and the modalities of issuing concurrence are mentioned herewith –

Stage I : In-principle Approval

(i) Process for according 'In-principle Approval' of the Project may be taken up after preparation and submission of Pre-feasibility Report of the proposed SHP by the Project Proponent as per the given Timeline of this Guideline. PFR stage activities may in general

be limited to the following field activities with subsequent Desktop Studies and preparation of the Report -

(a) Topographical Survey Report of the Project area with General Layout Plan of the Project.

(b) Requisite Data may be collected from available sources for formation of discharge data series of the river/ jhora /nala on which the proposed project will be developed. Discharge of the river/ jhora /nala may be measured at site by any appropriate Method as defined in the AHEC/CBIP Guidelines during the period of Survey. Consistency of the collected and measured short term discharge data may be checked during Power Potential Study and furnished in the Report.

(c) Appraisal of site geologic conditions will be based on visual inspection and should be done by an experienced Engineering Geologist. A report in this respect may be furnished in the PFR.

(d) Preliminary Hydraulic design of different project components is to be done as per available Net Head and Discharge in contemplation of the General Layout Plan of the Project.

(e) Project Cost Estimates is to be prepared as per Cl. No. 10 of this Guidelines at 'A'.

(f) Economic Evaluation should be done as per Cl. No. 11 of this Guidelines at 'A'.

(g) Name, location, line voltage and approximate distance of the nearby Substation of WBSEDCL should be mentioned in the PFR.

This approval has been considered mainly to facilitate the process of land acquisition and compliance of any other statutory requirement.

Stage II : Final Approval

(ii) Process for according 'Final Approval' of the project may be taken up after completing all activities mentioned at 'A' above by the Project Proponent as per applicability and necessary revisions/ modifications based on observations, if any given by the Authority while according 'In-principle Approval'.

The Project Proponent shall have to submit Final DPR with necessary revisions incorporating all the findings in the process including final Project Cost and Economic Evaluation. The proposed tariff shall be in conformity with the capping tariff for small hydro projects allowed by WBERC time to time and acceptable to WBSEDCL.

However the Project Proponent, if desires, may also obtain 'Final Approval' in one go on compliance of the requisite activities during DPR preparation as mentioned at **'A'.**

WBSEDCL will review the PFR/ DPR and forward it to the Power & NES Department, Govt. of West Bengal with necessary recommendations, if found that the PFR/ DPR complies with above mentioned Stipulations and Technically in order.

Thereafter, following further appraisal of the PFR/ DPR, the PAC will recommend for issuance of "In-principle Approval"/ "Final Approval" of the Project to the Power & NES Department, GoWB.

C. Project Time Line:-

Estimated Project timeline for PFR/DPR preparation and subsequent approval Process will be 24 months from the date of receipt of Proposal along with Concept Note from the Project Proponent to 'Start of Project' and attached at Annexure 'X'.

D. Approval Mechanism Depending on Capacity of the Project :

(i) Approval for the projects having proposed installed capacity (≤) 5 MW will be accorded by the Power & NES Department, Govt. of West Bengal on the basis of recommendation given by WBSEDCL.

(ii) Approval for the projects having proposed installed capacity (›) 5 MW and (≤) 25 MW will be accorded by the Power & NES Department, Govt. of West Bengal on the basis of recommendations of WBSEDCL and subsequent review & concurrence by the Project Appraisal Committee of P & NES Dept., GoWB.

E. Review/ Monitoring of Project Development:

The Project Proponent will have to submit progress report of the project work on **quarterly** basis to WBSEDCL. The later may review/ monitor the status of the project periodically on the basis of submitted report and occasional site visit, if considered necessary. WBSEDCL, in turn, will furnish the status of project development to the Power & NES Department, Govt. of West Bengal from time to time.

F. Validity of Concurrence

In case the time gap between the concurrence to the scheme by the Authority and the actual start of the work of the project by the Project Proponent is more than three years, the Project Proponent shall apply for revalidation of the concurrence giving justification.

(Annexure - X)

Timeline for Preparation & Approval of PFR/DPR after Allotment of the Project (Total 24 Months)

Sl. No.	Events / Activities	Number of Months
1	Proposal from Project Proponent	
2	Field Survey,Preliminary Investigation, Data Collection and Report Preparation	
3	Discharge measurement at site (at least two lean and one monsoon season)	
4	PFR Preparation by the Developer	
5	Submission of PFR by the Developer	
7	Checking, recommendation and approval process of the PFR by WBSEDCL and Power & NES Dept.	
8	In-principle Approval of the PFR	
9	Land Arrangement Process	
10	Geological Maping, Additional Surface and Sub-surface Investigations and Preparation of DPR with Project Cost Estimates and Tariff Calculation	
11	Submission of DPR	
12	Checking, recommendation and approval process of the DPR by WBSEDCL and Power & NES Dept.	
13	Final Approval of the DPR	
14	Submission of Final DPR to MNRE	
15	Start of Project