



**GOVERNMENT OF INDIA**  
**MINISTRY OF POWER**  
**CENTRAL ELECTRICITY AUTHORITY**

**GUIDELINES FOR EXAMINATION AND APPROVAL OF  
CHANGES IN DESIGN OF STRUCTURES / EQUIPMENT  
OF HYDROELECTRIC PROJECTS INCLUDING PUMPED  
STORAGE PROJECTS (PSPs) SUBSEQUENT TO  
ACCORD OF CONCURRENCE BY CEA**

**NEW DELHI**  
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# **Guidelines for examination and approval of changes in design of structures/ equipment of Hydroelectric Projects including Pumped Storage Projects (PSPs) subsequent to accord of concurrence by CEA**

## **1.0 Introduction:**

As per Section 8 (1) of the Electricity Act, 2003, any generating company intending to set up a hydro generating station shall prepare a scheme and submit to the Authority for its concurrence.

After Concurrence is accorded to the Detailed Project Report (DPR) of Hydroelectric (HE) Projects including Pumped Storage Projects (PSPs) by CEA, many a times developers find the requirement of making some modifications/ changes or deletion/addition of structures/equipment in the approved design of structures/equipment of the project due to various reasons like results of physical model studies, geological reasons, site conditions, unforeseen reasons, etc. These changes might affect the safety and performance of structures/ equipment, therefore in such a case, a proposal/Memorandum of Changes would need to be submitted to CEA for examination and concurrence of such changes/ modifications/ addition/ deletion prior to implementation of the same. A condition in this regard, is already being stipulated in the concurrence letters.

## **2.0 Purpose:**

To examine and accord concurrence in compliance to one of the conditions stipulated in concurrence letter for HE Projects including PSPs issued by CEA, "if any change in design parameters is proposed during construction / or before construction, the same shall be got concurred from the Authority before implementation of such changes". The proposal of such changes shall be submitted in form of "Memorandum of Changes (MoC)" to CE (HPA), CEA.

## **3.0 Scope:**

The proposal is required to be submitted by the concerned Generating Company/ Project Developer regardless of 'sector', i.e., Central, State and Private. The Generating Company/ Project Developer has to mention variation in cost due to such change in the proposal. The proposal are categorized into three categories as:

- 1) **Category-I:** The proposal requiring approval of the Authority
- 2) **Category-II:** The proposal requiring approval of respective appraising Group(s) viz. GSI, CSMRS, CWC, CEA (Not by Authority)
- 3) **Category-III:** the proposal requiring only intimation to CEA prior to its implementation at site by the Generating Company/Project Developer

Changes introduced under the Category-I, II and III are based on the past experience and the same may be revised based on the experience or suggestions received by the appraising agencies and developing agencies from time to time.

In case the MoC proposal falls under Category-I, it shall be appraised by respective appraising group(s). After the different aspects in the proposal are appraised by the respective appraising groups, HPA Division, CEA shall take up the proposal for approval of Authority. The Generating Company/ Project Developer has to implement the proposed changes at site only after approval of the Authority.

In case the MoC proposal falls under Category-II, HPA Division, CEA shall coordinate and proposal shall be appraised by respective appraising group(s). The Generating Company/ Project Developer may implement the changes after approval of concerned appraising group(s).

In case the MoC proposal falls under Category-III, the Generating Company/ Project Developer may implement the changes on prior intimation to CEA.

#### **4.0 List of Broad changes in designs:**

The Broad changes in project features occurred during construction of Hydro-electric projects including PSPs are categorized in following three categories as mentioned above:-

- 1) **Category-I:** the proposal requiring approval of the Authority.

The following changes in design features may be kept in this category:-

1. Change in Installed Capacity/ Change in number of units
2. Change in axis/location/alignment of the diversion structure
3. Change in Dam to Barrage or vice-versa
4. Change in Power House type (e.g. Underground to Surface or vice versa)
5. Change in type of turbine
6. Change in height of Dam / Barrage

- 2) **Category-II:** the proposal requiring approval of respective appraising Group(s) viz. GSI, CSMRS, CWC, CEA (Approval by Authority not required).

The following changes in design features may be kept in this category:-

1. Significant change (more than 20%) in extent of overburden and foundation conditions of diversion structure warranting considerable design change
2. Change in size or number of bays/spillways adversely affecting spillway capacity (SPF/PMF)
3. Change in diameter of water conductor system (HRT, Pressure shaft/ penstock, TRT, Surge shaft, etc.)
4. Exclusion or inclusion of de-silting chambers
5. Change in power house location/alignment, dimensions and its orientation
6. Exclusion or inclusion of Surge shaft or outfall gates
7. Change in water availability series
8. Change in powerhouse back slope and its stability parameters
9. Exclusion or Inclusion of Synchronous Condenser Mode
10. Switching from AIS to GIS or vice-versa
11. Exclusion or inclusion of Penstock Protection Valve or Main Inlet Valve

- 3) **Category-III:** the proposal requiring only intimation to CEA prior to its implementation at site by the Generating Company/ Project Developer

The following changes in design features may be kept in this category:-

1. Changes in Energy Dissipation Arrangement (EDA)
2. Change in type / location / dimensions / elevations / transient water levels of upstream and downstream surge shaft / surge chambers / collection galleries
3. Change in Transformer (single phase to three phase or vice-versa)
4. Change in Gas Insulated Busbar (GIB) to XLPE cable or vice-versa and XLPE to overhead or vice-versa
5. Change in no. of bays of Switchyard/Pothead yard
6. Change in location and introduction of additional Adits for speedy constructions
7. Change in design flood, design discharge, diversion flood and water levels (FRL, TWL, MDDL)

### **5.0 Monitoring of deviation in the project features/ changes at site:**

HPM Division, CEA will monitor the features or deviation in the features at site subsequent to accord of concurrence/ appraisal to the project by CEA, during construction and bring to the notice of HPA Division, CEA the deviation(s), if any proposed to be carried out or being carried out by the Generating Company/ Project Developer without approval/ prior intimation of CEA. HPA Division, CEA shall take up the matter with the Authority for an appropriate action.

### **6.0 Submission of proposal of Memorandum of design changes (MoC) by developer:**

Generating Company/ Project Developer shall submit 10 copies of MoC proposal incorporating information as per checklist given at **Annex**, along with soft copies to CE (HPA), CEA for its examination and concurrence by CEA. The structure of MoC shall be similar to that of DPR as given in the "Guidelines for formulation of Detailed Project Reports of Hydro Electric Projects/ Pumped Storage Projects, their acceptance and examination for concurrence" and it will mainly focus on areas where changes are proposed.

The MoC proposal must include details of cost implication due to proposed changes.

### **7.0 Acceptance of proposal of MoC:**

The Project Developer shall submit the proposal to HPA Division, CEA. HPA Division, CEA check with respect to category as mentioned under section 4.0 above and shall forward the same to concerned appraising groups of CEA/ CWC/ CSMRS/ GSI to whom it is pertaining. However, for aspects falling under Category-III, only prior intimation will suffice.

If a proposal contains aspects pertaining to different categories as mentioned under section 4.0, decision of HPA Division, CEA regarding the category of proposal shall be final.

In case it is found that the MoC proposal does not contain essential inputs or is found to be incomplete in certain respects, the same shall be returned to the Generating Company/ Project Developer for resubmission after incorporating the requisite details. If prima facie, the MoC proposal is found to be in order, it shall be taken up for detailed examination in CEA.

### **8.0 Examination of MoC proposal by concerned appraising groups:**

After receiving the proposal from HPA Division, CEA, the proposal under Category-I and II shall be examined by concerned appraising group(s) in CEA/ CWC/ GSI/ CSMRS, and the comments/ queries raised by them shall be promptly replied by the Generating Company/ Project Developer preferably within a period of 7 working days and not more than 15 working days, failing which the MoC proposal shall stand returned to the generating company.

The appraising groups shall issue approval indicating the details of appraised features.

### **9.0 Approval of Authority to MoC proposal in case of Category-I proposal:**

For the proposal, which requires approval of the Authority in case of category-I proposal, Generating Company/ Project Developer shall give a detailed presentation on all aspects of MoC proposal in an acceptance meeting convened by HPA Division, CEA. After the deliberations in meeting, decision would be taken in respect of concerned appraising groups as well as whether the details furnished in the MoC proposal are adequate for further examination of MoC proposal.

After obtaining clearances from all the concerned appraising groups for Category-I proposal, the agenda note for approval of the MoC proposal shall be prepared and submitted by HPA Division, CEA to Authority for its approval.

After approval of MoC proposal by the Authority, HPA Division of CEA shall advise the Generating Company/ Project Developer to submit an addendum to the approved DPR incorporating all the modifications as concurred by the Authority in the hard and soft copies in 8 (eight) nos. for record of the Authority. Thereafter, a letter of concurrence of changes in designs of structures/ equipment shall be issued by HPA Division, CEA.

### **10.0 Approval of respective appraising Group(s) in case of Category-II proposal:**

After receiving the communication regarding the category of proposal from HPA Division, CEA, approval of the respective aspects to be given by respective appraising group(s) as per prescribed timelines mentioned section 12.0, failing which, proposal may be treated as deemed approved and Generating Company/ Project Developer may start the work at site, provided that it should not violate any Government Guidelines/ Rules.

However, if any comments/ observations are raised by appraising group(s) within the prescribed timelines, those need to be complied by the Generating Company/ Project Developer before start of implementation.

**11.0 Implementation of MoC proposal in case of Category-III Proposal:**

For aspects in case of Category-III proposal, only prior intimation to CEA would be required before implementation. HPA Division, CEA will communicate to the Generating Company/ Project Developer regarding recording of intimation, accordingly.

**12.0 Timelines and flowchart for examination and approval:**

Keeping in view the impact of time and cost overrun on the proposal of Memorandum of Changes (MoC), following time limit has been kept for approval of all type of changes which needs to be followed by all appraising agencies for Category-I proposals:-

<b>Sl. No.</b>	<b>Aspect/Activity</b>	<b>Organization</b>	<b>Time Period (Working days)</b>
1	Scrutiny of the Proposal by HPA Division, CEA	CEA	7*
2	GSI/ CSMRS aspects	GSI/ CSMRS	15*
3	Dam/ Barrage	CWC	15*
4	Hydel Civil Design	CWC	15
5	Gates Design	CWC	10*
6	E&M Design	CEA	15
7	Design of switchyard and Power Evacuation works	CEA	15
8	Examination cost implication-Civil	CWC	10*
9	Examination cost implication-E&M/ATS	CEA	10
10	Preparation of Appraisal Note and its approval for Category-I proposal only	CEA	10*
	Approval of the Authority		20*
	<b>Total maximum time (for Category-I proposal only)</b>		<b>87</b>

\* Critical path, considering parallel examination of other aspects

**Note:**

1. In case of Category-II proposal, timeline will be limited to the timeline of concerned

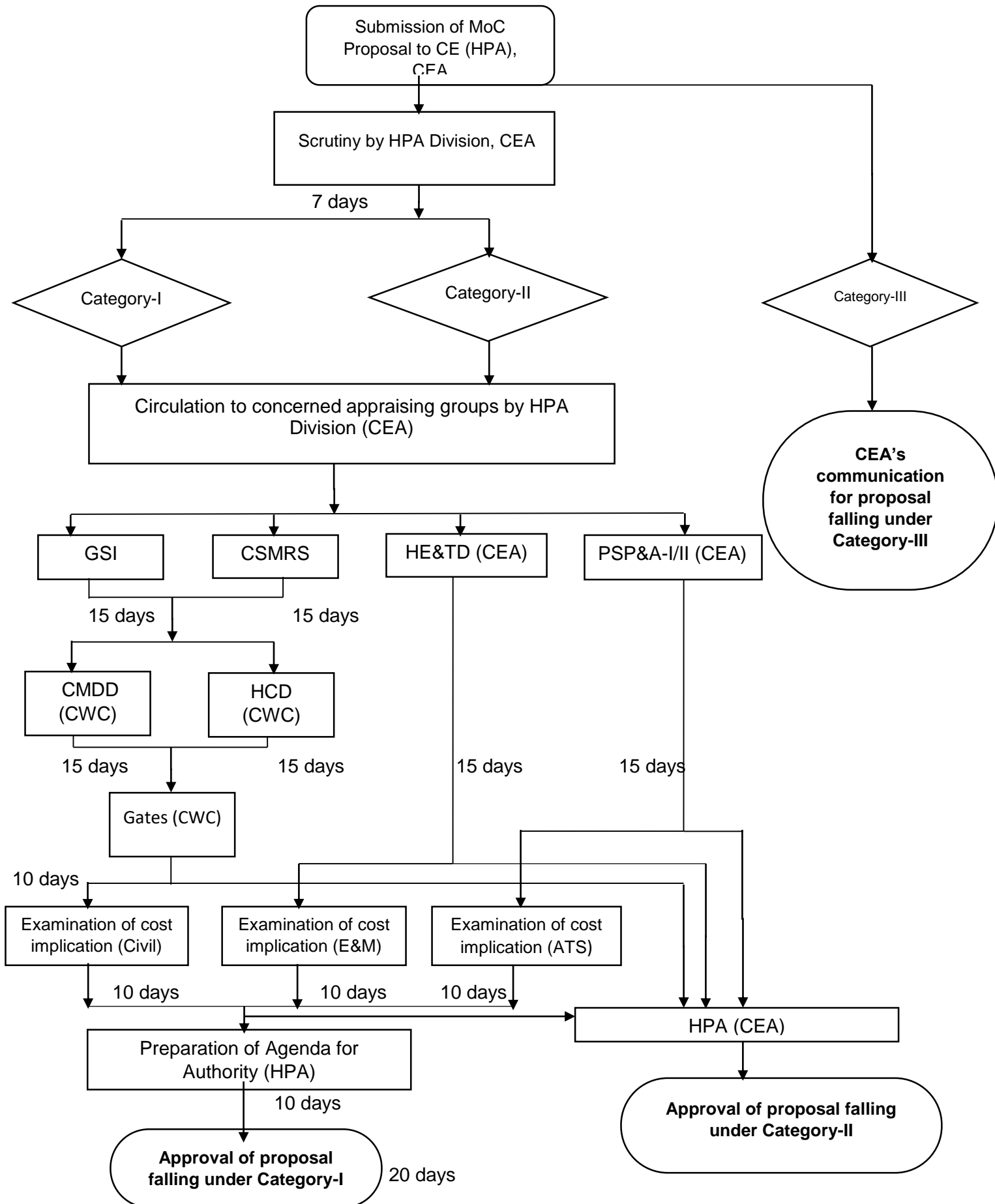
appraising Group only

2. In case the proposal is not approved by the respective appraising group within stipulated time, it will be deemed as approved.
3. In case the Category-I proposal is not approved by the Authority within 87 working days, it will be deemed as approved.

The flowchart of MoC is given at **Appendix**.



**Procedure for examination of MOC proposal**



**Checklist for MoC proposal**

1. Comparative statement of salient features viz. approved v/s. proposed changes along with variation in cost.
2. Detailed justification of respective proposed changes.
3. Details/results of model studies, tests etc.
4. Current status of compliance of conditions mentioned in the concurrence letter.
5. Copy of statutory clearances obtained till date.
6. Commissioning schedule.