



भारत सरकार/**Government of India**  
 विद्युत मंत्रालय/**Ministry of Power**  
 केंद्रीय विद्युत प्राधिकरण/**Central Electricity Authority**  
 जल विद्युत अभियांत्रिकी व प्रौद्योगिकी विभाग कास एवं नवीनीकरण व आधुनिकीकरण  
 प्रभाग  
**Hydro Engg. & Tech. Dev. and Renovation & Modernization  
 Division**

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No. 10/03/HE&TD/2025/

Date: 28.04.2025

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To,  
 As per list,

**Subject:** Seeking comments on 'Draft Safety Audit Checklist' in respect of Hydro Power Sector for monitoring the compliance of Central Electricity Authority (Safety Requirements for Construction, Operation and Maintenance of Electrical Plants and Electric Lines) (Amendment) Regulations, 2022 - reg.

Sir/ Madam

Please refer to the subject. It is to mention that incompliance to Central Electricity Authority (Safety Requirements for Construction, Operation and Maintenance of Electrical Plants and Electric Lines) (Amendment) Regulations, 2022, a draft "Safety Audit Checklist" in respect of Hydro Power Sector (copy attached) has been prepared by this office.

In this regard, it is requested that inputs/ comments on the same may please be provided within 45 days from today i.e. 28.04.2025, on the following email address:

hetdcea@nic.in

**Encl:** As above

Yours faithfully,

(Shyam Singal)

Asst. Director

To:

1. MDs/CMDs/CEOs of CPSUs/State Utilities/Private Developers

Copy to:

1. SA to Chairperson, CEA.
2. SA to Member (Hydro), CEA.
3. IT Division, CEA - with a request to upload a copy on the website

## General Information on using the checklist

S.No.	Areas	Sheet Name
1	Plant Biodata	<a href="#">Biodata</a>
2	General Aspects of Safety	<a href="#">GA</a>
3	Hydro Turbine	<a href="#">Turbine</a>
4	Hydro Generator	<a href="#">Generator</a>
5	E&M Equipment	<a href="#">E&amp;M Equipment</a>
3	Emergency Management Plan (EMP)	<a href="#">Annex A</a>
4	Fire Protection	<a href="#">Annex B</a>

**Please note :-**

- 1 Question that require answering in Yes/No may be answered accordingly.
- 2 Details may be provided in questions wherever asked.
- 3 Remarks column may be used for providing clarification/ additional information, if any.
- 4 Questions shall be answered based on documentary evidence supporting the arguments.
- 5 The relevant documents may be asked to be reproduced at the time of safety audit.

### Safety Audit Plan for Hydro Electric Power Station

Plant Biodata			
SI No.	Item	Values	
1	Name of Utility		
2	Sector ( <i>Central/State/Private</i> )		
3	Region ( <i>NR/WR/ER/SR/NER</i> )		
4	Name of the Plant		
5	Location ( <i>District, State</i> ) (Longitude and Latitude)		
6	Total Capacity of Plant		
7	No. of UnitsxUnit Size & their date of commissioning		
8	Area of the plant ( <i>Premise of the plant</i> )		
9	General Arrangement/ Layout of the plant	Attach plant layout drawing	
10	Status of Various awareness programs conducted on safety for manpower?	Yes/ No; give details	
11	What is the competency level of manpower? Are they aware about safety at workplace?	Yes/ No; give details	
12	Total Strength/ No. of Employees (indicate category-wise (Skilled/ semi-skilled/ unskilled)) & Permanent/Contractual		
13	Name of the Agency/ person, if any, awarded for O&M jobs of the power plant		
14	Name of the Security Agency hired by the power plant, if any		
15	Name of the Security Officer		
16	Name and Contact details of Nodal officer for Safety Audit ( <i>not below the rank of GM</i> )		
17	Nearest Emergency Services	Yes/ No; give details	
	a. Fire Station		
	b. Hospital		
	c. Police Station		
18	Distance of Dam and Power house to nearest hospital and time taken depending on the condition of road		
19	Name of safety officer alongwith contact details		
20	High flood level as per design		
21	High flood level witnessed after commissioning of power plant		
22	Elevation of draft tube deck with respect to HFL		
23	Elevation level at entry of Main Access Tunnel with respect to HFL		

**Checklist for Power House Electro Mechanical Equipments and Various Floors**

<b>A. Safety Aspects of Floors</b>			
<b>SI No.</b>	<b>Items to be Checked / verified</b>	<b>Status</b>	<b>Remarks, if any</b>
<b>1</b>	<b>General Aspects</b>		
1.1	Whether emergency numbers are displayed at prominent locations all over power house?	Yes/ No	
1.2	Whether there is proper display of Exit path & Exit door used for emergency situation at prominent locations all over power house?	Yes/ No	
1.3	Whether any scrap/Hazardous material stored on on any location/floor?	Yes/ No	
1.4	Status of Various awareness programs conducted on safety for manpower?		
1.5	What is the competency level of mapower? Are they aware about safety at		
1.6	Whether display has self luminescence (visible in dark)?		
<b>2</b>	<b>Safety Aspects w.r.t all Main floors, Auxiliary/Annexe bay floors, Connecting galleries &amp; Tunnels of Power House Complex:</b>		
2.1	Whether all floor cutouts are covered	Yes/ No; give details	
2.2	Whether Handrails are provided wherever needed and their condition	Yes/ No; give details	
2.3	Whether any abnormality / deformation noticed in floor	Yes/ No; give details	
2.4	Status of healthiness of support structure for following equipmetns for each floor		
i	Cable & Cable support structure	Yes/ No	
ii	Ventilation /A.C. ducts & their support structure	Yes/ No	
iii	Water/Air/Oil pipelines and their support structure	Yes/ No	
2.5	Leakage from any equipment/piping	Yes/ No; give details	
2.6	Proper working of drainage systems of the concerned area	Yes/ No; give details	
2.7	Clear pathway is provided on upstream & downstream of generating unit on floors areas without any obstructions of piping/duct/cable trays/hangers/panel etc.	Yes/ No; give details	
2.8	Clear Passage for movement of Vehicle/Man/equipment is provided in Service Bay and in case of Main Access Tunnel (MAT)	Yes/No	
2.9	Proper Ventilation is available and working	Yes/No;give details	
2.10	Whether proper platforms are provided wherever required	Yes/No	
2.11	Any unwarranted equipment/tools lying on floor apart from approved layout plan.	Yes/ No	
2.12	Proper hatch Covers are provided at appropriate location	Yes/ No	
<b>3</b>	<b>Checking of records for the healthiness/past performance of the following Electro-Mechanical equipments as per O&amp;M Manual</b>		
3.1	Generator & Core, Rotor, Generator Guide Bearings, Thrust Bearings, Excitation System, Brakes & Jack Assembly, Alignment, Balancing & Vibrations etc.	Give details	
3.2	Turbine (Turbine Guide Bearings, Servo Motors, Operating Machanism, Butterfly Valve/MIV, Top cover leakages, shaft, shaft seal, vibrations, Governor System etc.	Give details	
3.3	Transformers and their protections (Power Transformers, Unit Auxiliary Transformers, Station Auxiliary Transformer etc.)	Give details	
3.4	IPBD/SPBD/ NSPBD and its accessories	Give details	
3.5	Switchyard equipment/ Potheyard / GIS (Circuit Breakers, CTs, PTs, LAs, Earth Switches, 132/220/400kV feeders equipment within switchyard area and safety aspects etc.)	Give details	
3.6	Drainage and Dewaterig System (pumps, motors, pipe lines, valves etc.)	Give details	
3.7	Cooling Water System (pumps, motors, pipe lines, valves, straines, Heat Exchangers etc.)	Give details	
3.8	D.C. Batteries & D.C. Distribution Boards, Charger	Give details	
3.9	Oil Presssure Units, AC Distributoration Board, Pump, Motors, Strainer etc.	Give details	
3.1	HP & LP Compressors, Recievers	Give details	
3.11	EOT Cranes (all Motions i.e. CT, LT, Breaking System, emergency Stoppers, Healthiness of steel ropes)	Give details	
3.12	D.G. Sets and its readiness for emergency operation.	Give details	
3.13	Check the Earthing system of Power House, Switchyard Area and power plant equipment	Give details	
3.14	Computerised Control System- Checking of Status of Online Monitoring System for Electromechanical equipments	Give details	
3.15	Checking the preservation of records in paper or electronic format, concerning the operation and maintenance of a Generating Assessts, Viz History sheet of each equipment, Relay testing Records, machine wise annual and major maintehance record, Daily/weekly, quarterly, half yearly & yearly maintenance records specifications, warranties and logbooks, O & M Manual, Safety Manual, Store Manual etc. and checking the present status of equipment.	Give details	

3.16	Checking of the record of any modification to a drawing/document and the original drawing/document, the modified entry, the date of the modification, the person who made or authorized the modification, and the reasons for the modification	Give details	
3.17	Checking/Review of the past audits conducted by the third party such as Labour Inspector, Fire Inspector, Energy Auditor or other technical audits, if any, for ensuring compliance	Give details	
3.18	Illumination System (proper illumination through out Power House, Emergency illumination). What is the frequency of measurement?	Give details	
<b>4</b>	<b>Major System related to safety aspects</b>		
4.1	Fire Fighting System - Checking of Provision of following Sub-Systems/Items		
4.1.1	Separate System for fire protection of following equipments as per CEA safety regulations		
a	Generator Transformer & Other Station/Unit Transformer	Yes/No	
b	Shunt Reactor	Yes/No	
c	Lubricating / Insulating Oil Plant Room (if Oil storage is provided therein)	Yes/No	
d	OPU's of Governor & MIV	Yes/No	
e	Control Room Area	Yes/No	
f	Any other equipments	Yes/No	
4.1.2	Water Hydrant System & Hose reels on all floors at appropriate locations	Yes/No	
4.1.3	Portable Fire Extinguishers on all floors at appropriate locational	Yes/No	
4.1.4	Placement fo Sand Buckets	Yes/No	
4.1.5	Fire Detection System	Yes/No	
a	Hooter Cum Strobe	Yes/No	
b	Smoke/Heat Detectors	Yes/No	
c	Linear Heat Detectos	Yes/No	
d	Air Duct Smoke Detector	Yes/No	
e	LHS Cable	Yes/No	
f	Any other Detector	Yes/No	
4.1.6	Fire Dampers in ducts of Ventilation System	Yes/No	
4.1.7	Cladding of fire resistant material on IPBD / GIS duct & fire resistant tiles on roof of transformers/shunt reactor	Yes/No	
4.1.8	Fire resistant wall between each Generator Transformers & Shunt reactor	Yes/No	
4.1.9	Provision of dedicated water tank/reliable source for fire fighting system with suitable redundancy	Yes/No	
4.1.10	Requisite number of safety kits & self containing breathing apparatus	Yes/No	
4.1.11	Requisite self illuminating fluorescent directional signals for direction to escape routes/stairs	Yes/No	
4.1.12	First Aid Box with essential medicines	Yes/No	
4.1.13	Respiratory Kits	Yes/No	
4.2	Flood Protection System - Checking of provisions as per CEA regulation	Yes/No	
a	Healthiness of Pumps & Motors for the system	Yes/No	
b	Provision of suitable number of stand by pump motor sets	Yes/No	
c	Periodic checking of the systmes / equipment	Yes/No	
d	Provison of Float / Inundation switches is power House for alarm	Yes/No	
e	Check discharge of flood water pipe above HFL of Project	Yes/No	
f	Any other equipments	Yes/No	
4.3	Security & Surveillance System	Yes/No	
4.3.1	Provision of CCTV cameras with suitable night vision covering all major areas of P.H. including all floors, MAT, B.F.V. Chambers, TRT areas, Dam areas, Surge Shaft / Chambers, Staircases / Elevators etc.	Yes/No	
4.3.2	Provision of CCTV monitors in control room and security room for simulataneous feed	Yes/No	
4.4	Public Address and communication system	Yes/No	
4.4.1	Provison of Public Address System including loud speakers/microphone in all main zones of power house areas with control from Main Control Room, Field Handset station	Yes/No	
4.4.2	Provision of Communication system including walkie - talkie & corded landline telephone system	Yes/No	
4.4.3	Video Management system	Yes/No	
4.4.4	Video Storage Unit	Yes/No	

## B. Safety Aspects of Turbine

SI No.	Items to be Checked / verified	Status	Remarks, if any
<b>1 General Aspects</b>			
1.1	Status of Various awareness programs conducted on safety for Turbine manpower?	Yes/ No; give details	
1.2	What is the competency level of manpower? Are they aware about safety at workplace?	Yes/ No; give details	
<b>2 Upkeep of Turbine Floor</b>			
2.1	Overall Healthiness of Turbine Floor: Poor / Satisfactory / Excellent	Give details	
2.2	Whether anti skid tiles are provided on turbine floor?	Yes/ No	
2.3	Are there any cavities? Ensure if all floor cavities are covered.	Yes/ No	
2.4	The condition of the hangers and supports of all critical piping? Is any replacement required?	Yes/ No; give details	
2.5	Whether proper platform around Turbine is available for maintenance work?	Yes/ No	
2.6	Whether oil drums are kept on the turbine floor?	Yes/ No	
<b>3 Turbine Vibrations</b>			
3.1	What are the Main Turbine Vibration readings? Please give Unit wise readings.	give details	
3.2	Is Main Turbine vibration protection available in each unit? Please mention brief about the Main Turbine vibration protection.	Yes/ No; give details	
3.3	Is Main Turbine vibration protection kept in service?	Yes/ No	
3.4	Recent incidents of high turbine vibration. Provide list of occurrences & vibration levels.	Yes/ No; give details	
<b>4 Turbine Foundation &amp; Civil works</b>			
4.1	Healthiness of Turbine Deck, Foundation & Column Structure	Give details	
4.2	Any physical cracks observed in the Turbine civil structure.	Yes/ No	
<b>5 Turbine casing</b>			
5.1	Healthiness of turbine casing observed during last maintenance	Yes/ No	
5.2	Record of Guide vane closing time checked during annual maintenance?		
<b>6 Turbine blades</b>			
6.1	Whether profile of runner blades brought to original after maintenance or runner replaced in last maintenance	Give details	
6.2	Whether any tests are conducted for estimating healthiness of runner	Yes/ No	
6.3	Signs of high vibration of turbine rotor	Give details, if any	
6.4	Signs of solid particle erosion on blades	Give details, if any	
<b>7 Main Inlet &amp; Penstock Protection Valves</b>			
7.1	Is valve provided? Please mention for each unit.	Yes/ No	
7.2	Type of Valve?	give details	
7.3	Whether valve complies the requirements of latest version of relevant IS or IEC	Yes/No, give details	
7.4	Checking of opening and closing of valves under balanced water conditions	give details	
7.5	Is suitable number of air release valves and anti-vaccum valves provided?	Yes/No, give details	
7.6	checking of MIV under emergency condition	give details	
7.7	Is BFV provided after the surge shaft as second line of defence if HRT length more than 5000 m	Yes/No, give details	

7.8	What is the closing mechanism of BFV	give details	
7.9	Healthiness of valves	Yes/ No	
7.10	Regular checkup of valves required for smooth operation. What is the frequency of these checkups?	Yes/ No	
7.11	Are any deposits observed at valve body?	Yes/ No	
7.12	Are all valves tested, inspected, and overhauled on a frequent basis	Yes/ No	
7.13	MIV closing time checked during maintenance	Yes/ No	
7.14	Whether closing of MIV by oil and closing by weight separately done?	Yes/ No	
7.15	Checking of emergency closing of penstock gates due to low pressure of OPU, in case MIV is not provided in scheme?		
<b>8 Valves &amp; NRVs</b>			
8.1	Is there any passing of Stop Valves? Please mention for each unit.	Yes/ No	
8.2	Is there any passing of control valves? Please mention for each unit.	Yes/ No	
8.3	When safety valve were pressure tested?	Yes/ No; give details	
8.4	Healthiness of valves	Yes/ No	
8.5	Regular checkup of valves required for smooth operation. What is the frequency of these checkups?	Yes/ No	
8.6	Are any deposits observed at valve body?	Yes/ No	
8.7	Are all valves (including NRV) tested, inspected, and overhauled on a frequent basis	Yes/ No	
<b>9 Turbine HP-LP Bypass System</b>			
9.1	Availability of HP Bypass and LP bypass system? Is it available in auto? Please mention for each unit.	Yes/ No; give details	
<b>10 Turbine lubricating oil &amp; jacking oil system</b>			
10.1	What is the healthiness of Lubricating Oil system? Please mention for each unit.	Yes/ No; give details	
10.2	Is hydro test of lube oil system carried out? What is the periodicity of checking?	Yes/ No; give details	
10.3	Periodicity of inspection of Oil pipe line?	Yes/ No	
10.4	What is the healthiness of Jacking oil system? Please mention for each unit.	Yes/ No; give details	
10.5	Availability and healthiness of centrifuge? Please mention for each unit.	Yes/ No; give details	
10.6	If applicable, healthiness of N2 accumulator, N2 gas cylinder	Yes/ No; give details	
10.7	Healthiness of Oil Tanks from fire protection point of view?	Yes/ No	
<b>11 Fire Protection in Turbine Area</b>			
11.1	Is Turbine fire protection system healthy? Please mention for each unit.	Yes/ No	
11.2	Availability with location chart of fire extinguishers?	Yes/ No	
11.3	Availability of fire extinguishers as defined for Turbine area at designated place in Turbine hall?	Yes/ No	
11.4	Whether there is any well-defined escape route in case of Fire/Oil leakages?	Yes/ No	
11.5	Is there any Overhead electric cables/live wire on Turbine Floor?	Yes/ No	



11.6	Whether Cable galleries fire protection system in place?	Yes/ No	
<b>12</b>	<b>Miscellaneous</b>		
12.1	Is there any oil leakage?	Yes/ No	
12.2	Is any cotton waste or, miscellaneous debris lying around the turbine and its vicinity?	Yes/ No	
12.3	Availability of sign/instruction boards on safety in Turbine floor?	Yes/ No	
12.4	Is any safety drill conducted at Turbine Floor?	Yes/ No	
12.5	Availability of arrangements for proper covering / barricading of various opening in Turbine Floor made during work or left out jobs?	Yes/ No	
12.6	During rainy season, whether there is dripping of water in the machine hall? If yes, whether treatment of roof (in case of surface power house) done? In case of underground power house, what measures taken to avert dripping of water and outcome of same?	Yes/ No; give details	
<b>13</b>	<b>Any other system associated with Turbine or any other issue related to safety of Turbine Floor</b>		

### C. Safety Aspects of Hydro Generator

SI No.	Items to be Checked / verified	Status	Remarks, if any
<b>1</b>	<b>General Aspects</b>		
1.1	Status of Various awareness programs conducted on safety for Generator manpower?	Yes/ No	
1.2	What is the competency level of manpower? Are they aware about safety at workplace?	Yes/ No; give details	
<b>2</b>	<b>Upkeep of Generator Floor</b>		
2.1	Overall Healthiness of Generator Floor: Poor / Satisfactory / Excellent	Give details	
2.2	Are there any cavities? Ensure if all floor cavities are covered.	Yes/ No	
2.4	What about the hangers and supports of all critical piping? Is any replacement required?	Yes/ No	
2.5	Condition of Support systems, pipings?	Yes/ No	
2.6	Whether proper platform are available for Maintenance?	Yes/ No	
<b>3</b>	<b>Generator</b>		
<b>3.1</b>	<b>General</b>		
3.1.1	Is Generator complies with the requirement of latest version of IS/IEC?	Yes/ No	
3.1.2	Is Generator capable of withstanding the maximum stresses during normal operation, run-away speed conditions, two phase or three phase short circuit condition, single phase earth fault, out of phase synchronisation etc.	Yes/ No	
3.1.3	Is the insulation of Rotor Pole checked periodically?	Yes/ No	
3.1.4	Whether surge arrestors are provided?	Yes/ No	
3.1.5	Whether Resistance Temperature detectors or any other type of temperature sensors are provided at suitable locations?	Yes/ No	
3.1.6	Whether suitable arrangement for Rotor winding temperature is provided?	Yes/ No	
3.1.7	Whether Dynamic Braking is provided in addition to mechanical brakes in case prime mover is pelton turbine	Yes/ No	
<b>3.2</b>	<b>Bearing Arrangement</b>		
3.2.1	What type of bearings are provided?	give details	
3.2.2	What is the limiting temperature of bearings?	give details	
<b>3.3</b>	<b>Fire Protection System</b>		
3.3.1	what type of fire supression system is provided?	give details	
3.3.2	Is fire supression system checked periodically?	Yes/ No	
<b>3.4</b>	<b>Generator Bus Duct</b>		
3.4.1	Whether generator bus duct complies the requirement of relevant IS or IEC	Yes/ No	
3.4.2	What type of Bus duct is provided?	give details	
3.4.3	what type of arrangement is provided to prevent moisture?	give details	
3.4.4	Whether bus duct is designed to carry the maximum continous current under normal site conditions without exceeding temperature rise limits	Yes/ No	
<b>3.5</b>	<b>Generator Neutral Grounding Terminal Equipment</b>		
3.5.1	Whether Generator Neutral grounding equipment is capable of maximum permissible operating voltage?	Yes/ No	
3.5.2	Whether System Earthing is possible to provide earth fault protection with proper discrimination?	Yes/ No	
<b>3.6</b>	<b>Machine Condition Monitoring</b>		
3.6.1	Whether Online Air Gap monitoring is provided?	Yes/ No	
3.6.2	Whether Online Vibration Monitoring is provided?	Yes/ No	
3.6.3	Whether Online Partial discharge Monitoring System is provided?	Yes/ No	
3.6.4	Whether Generator seal oil system is in good condition?	Yes/ No	
3.6.5	How many DG sets with capacity in KVA are in working condition?	Give details	
3.6.6	How much load in KW at 0.8 pf can be fed individually and collectively by DG sets?	Give details	
3.6.7	Whether Eyewash System is available in Battery Room	Yes/ No	

<b>D. Safety Aspect of Transformer</b>			<b>Remarks, if any</b>
1	Whether Transformer comply with the requirements of Latest Version of relevant IS/IEC?	Yes/ No	
2	What type of Transformer is used; Single Phase or Three Phase	give details	
3	What type of cooling system is provided?	give details	
4	Whether Cooling System checked periodically?	Yes/ No	
5	Whether Surge Arrestor provided on HV side, if Transformer is located in Open Area?	Yes/ No	
6	Whether Fire Wall provided as per guidelines of BIS?	Yes/ No	
7	What type of Protections are provided?	give details	
8	Whether the protections checked periodically?	Yes/ No	
9	Whether protections in compliance with the CEA (Technical Standard for Construction of Electric plants and Electric Lines) Regulation, 2022	Yes/ No	
10	<b>Any other system associated with Step Up transformer or any other issue related to safety of Transformer</b>		
<b>E. DC Supply System</b>			
1	What is the capacity of DC Supply System?	give details	
2	Whether battery capable to meet the load in addition to 3 hours of Uninterrupted Emergency Illumination as per CEA (Technical Standard for Construction of Electric plants and Electric Lines) Regulation, 2022	give details	
3	Whether battery charger capable to work in both modes i.e. Float as well as Boost mode?	Yes/ No	
4	Location of DC batteries, Charger & DC Boards. Are they located as per CEA (Technical Standard for Construction of Electric plants and Electric Lines) Regulation, 2022	Yes/ No	
5	When was the battery bank capacity test conducted?	Yes/ No	
6	Whether Exhaust system of battery room working?	Yes/ No	
<b>F. Grounding System</b>			
1	Is Grounding System provided as per IS/IEC?	Yes/ No	
2	Are all the equipments properly grounded?	Yes/ No	
3	How much minimum points of grounding for each equipment specially High Voltage Equipment is provided?	give details	
<b>G. Illumination System</b>			
1	Is Emergency illumination is provided?	Yes/ No	
2	What type of Illumination is provided?	give details	
3	How many power supply sources are provided for illumination, in case of Emergency?	give details	
<b>H. EHV or HV or LV Power Cables</b>			
1	What type of cables are provided?	give details	
2	Is segregation of cables and proper spacing maintained?	give details	
3	Are Control cables & Power cables laid on separate trays/tiers?	Yes/ No	
4	Is proper ventilation & heat dissipation for cables are provided?	Yes/ No	
<b>I. DG System</b>			
1	Is DG System provided?	Yes/ No	
2	Is DG is capable to cater the emergency load?	Yes/ No	
3	Is DG Set check periodically?	give details	
4	What type of DG Set used in the system?	give details	
5	Is the DG system available? What is the periodicity of checking?	Yes/ No; give details	
<b>J. Electric Overhead Travelling Crane (EOT Crane)</b>			
1	When was the Load Testing of EOT crane, checking of Limit switches etc. last conducted.	Give details	
2	Is handrail provided besides walking platform (Beside rails) approach to EOT?	Yes/ No	
3	Is designated place marked for EOT Crane marking?	Yes/ No	
4	Is SWL for each hook mentioned over crane and hooks?	Yes/ No	
5	Is anti-collision device of both EOT crane functional?	Yes/ No	
6	Is limit switches of both hooks tested?	Yes/ No	
7	Is designated crane operator available for operation of EOT crane?	Yes/ No	
8	Are the Hooters & lights of EOT crane functional?	Yes/ No	
9	Is load cell operational?	Yes/ No	
10	Condition of DSL, any water dripping?	Yes/ No	

## Annex- A Emergency Management Plan

SI No.	Items to be Checked / verified	Status	Remarks, if any
	<b>Emergency Management Plan</b>		
1.1	Is Emergency Response Disaster Management Plan (ERDMP) - (both On-Site & Off-Site) in place	Yes/ No	
1.1a	Is an Emergency Preparedness Plan available (including fire prevention and emergency response) and prominently displayed?	Yes/ No	
1.2	Is it approved by the Appropriate Authority	Yes/ No; indicate designation	
1.3	Is there a proper system available to communicate emergency? (PA System / Fire Detection And Alarm System (FDA) / Emergency alarm)	Yes/ No	
1.4	Is Emergency Response Team (Fire Fighting / Rescue Teams) available round the clock (24x7)?	Yes/ No	
1.5	Is there a Safety Control Room? Is it equipped for emergencies?	Yes/ No	
1.6	Are (i) Fire Tenders, (ii) Foam generating systems, (iii) Breathing apparatus available?	Yes/ No	
1.7	Is emergency contact numbers including name & no. of nearest police station, fire-brigade station and hospital displayed on the board?	Yes/ No	
1.8	Are employees familiar with emergency evacuation procedures, particularly evacuation routes?	Yes/ No	
1.9	Assembly point available at safe location away from stores?	Yes/ No	
1.10	Details of number of assembly points, awareness of these assembly points amongst workers and staff?	indicate details	
1.11	Is the system of conducting Mock drills in place? Are mock drills conducted at least once in 6 months and records of the mock drills conducted in last 2 years?	Yes/ No; indicate numbers	
1.12	Are the roles and responsibility of the individuals known to each of the person identified in the EMP/ DMP?	Yes/ No	
1.13	Proper "First Aid Fire Fighting" training given to Security personnel or operators?	Yes/ No	
1.14	Is there a Siren available? Is it tested regularly? What is its audible distance?	Yes/ No; indicate distance	
1.15	Whether Emergency exit meets the requirement of the standard? Are the emergency exit doors having minimum width?	Yes/ No	
1.16	whether Access and Exit ways large enough to allow a man wearing breathing apparatus to pass through?	Yes/ No	
1.17	Are exits clearly visible and the route to reach the exits are clearly marked in green colour and signs posted to guide the occupants of the floor concerned as per IS 9457?	Yes/ No	
1.18	Are Signs illuminated and wired to an independent electrical circuit on an alternative source of supply?	Yes/ No	
1.19	Is every exit, exit access or exit discharge continuously maintained free of all obstructions?	Yes/ No	
1.2	Whether separate circuits for fire fighting pumps, lifts, staircases and corridor lighting and blowers for pressurizing system are provided directly from the main switch gear panel and these circuits laid in separate conduit pipes, so that fire in one circuit will not affect the others?	Yes/ No	
1.21	Whether Air-conditioning and ventilating system circulating air to more than one floor or fire area is provided with dampers designed to close automatically in case of fire and thereby preventing spread of fire or smoke and is in accordance with IS 659?	Yes/ No	
1.22	Whether AC system is provided with automatically switched off mechanism before the extinguishing system is put into operation?	Yes/ No	
1.23	Is alternate source of power supply provided for a fire lift through a Automatic change over switch?	Yes/ No	
1.24	Whether each fire lift is equipped with suitable inter-communication equipment for communicating with the control room?	Yes/ No	
1.25	Is emergency lighting powered from a source independent of that supplying the normal Lighting?	Yes/ No	
1.26	Whether the oil storage tanks is provided with fixed foam fire extinguishing system?	Yes/ No	

1.27	whether On and Off type sprinkler system/ inert gas is provided in the control room?	Yes/ No	
1.28	Whether control room have 2 hours fire resistance with smoke stock fire check doors or the same rating?	Yes/ No	
1.29	Whether Smoke detectors are provided in the control room on cross zoning principle with suitable time delay device incorporated?	Yes/ No	
1.3	Whether electrical equipment and installation of power station conform to the relevant Guidelines given in IS 1646?	Yes/ No	
1.31	Whether Electrical equipment is kept free of deposits of oil, grease, carbon dust etc.?	Yes/ No	
1.32	whether Fire protection equipment for cable galleries, cable runs etc. conform to the provisions contained in IS 12459?	Yes/ No	
1.33	Whether all transformer installations have safety provisions as per IS 1646?	Yes/ No	
1.34	Whether, for effective fire fighting purpose, the minimum illumination provided for all working places such as turbine houses etc. is 100 lux and for control rooms is 150 lux as per IS 1646?	Yes/ No	
1.35	whether the Generator and supporting structure have fixed water spray type protection system?	Yes/ No	
1.36	whether provision of fixed CO2 or dry chemical system backed by water spray systems are there to stop the spread of fire?	Yes/ No	
1.37	Whether Fixed high velocity water spray system is provided for oil systems, oil piping pumps etc.?	Yes/ No	
1.38	whether Fire barrier wall is provided between transformer where these are less than 15 meters apart or where the oil capacity exceeds 2000 liters?	Yes/ No	
1.39	Whether hydrant system provided in switchyard?	Yes/ No	
1.4	whether enclosed switch gear room automatically provided with CO2 flooding system?	Yes/ No	
1.41	whether fire barriers provided in accordance with IS 12459 to limit the spread of fire along cable ways?	Yes/ No	
1.42	Whether cable entries in the switch gear room is sealed by use of fire stops?	Yes/ No	
1.43	whether Cable galleries or runs are provided with automatic fixed fire fighting installations using water, CO2 or high expansion foam?	Yes/ No	
1.44	Whether all the cable trenches in entire plant are properly covered with slabs.	Yes/ No	
1.45	whether the water supply for fire fighting for power stations conform to the provisions contained in IS 9668 and internal hydrant system to IS 3844 and external hydrant system to IS 13039?	Yes/ No	
1.46	whether the fire fighting pumps are of automatic starting with manual stopping and in conformity with IS 12469?	Yes/ No	
1.47	whether the entire station area provided with manual fire alarm system with call boxes conforming to IS 2189?	Yes/ No	
1.48	whether Lightning protection for the power station buildings, outdoor bulk Oil Storage Tanks and Switchyard areas provided?	Yes/ No	
1.49	whether provision of emergency power supply for the fire fighting system is provided?	Yes/ No	
1.5	whether major fire fighting appliances/ equipment maintained all the time to meet the emergency requirements in accordance with IS 3034?	Yes/ No	
1.51	whether minimum man-power is maintained in all the shifts to maintain and operate the firefighting equipment/appliances?	Yes/ No	
1.52	whether Power Stations authorized for full time fire brigades with major fire fighting appliances with trained fire fighting staff? Give status.	indicate details	
1.53	whether power plant Owner provided the information to concerned District Collector as per the requirement mentioned under Para 9 sub para (5) of the CEA (Safety Requirements for Construction, Operation and Maintenance of Electrical Plants and Electric Lines) Regulations 2011.	Yes/ No	
1.54	In case of underground power house, whether escape route through cable tunnel or any other route well known to personnel?	Yes/ No	
1.55	Whether Generator transformer provided with high velocity water spray system and or fire fighting system?	Yes/ No	
1.56	What is the condition of soak pit(s)	indicate details	

2	<b>Any other issues in Emergency Management Plan</b>		

## Annex B

## Annexure – B on Fire Protection

SI No.	Items to be Checked / verified	Status	Remarks, if any
<b>Fire Detection, Protection and Maintenance System</b>			
1.1	How many fire pump houses are there? How many pumps are installed and their types?	indicate details	
1.2	Are fire hydrant pumps adequately available and their frequency of testing?	Yes/ No; indicate periodicity	
1.3	Are fire hydrant jockey pumps adequately available and their frequency of testing?	Yes/ No; indicate periodicity	
1.4	What is the fire water pressure availability at the farthest point and at the highest point?	indicate value	
1.5	What is the periodicity of fire tenders inspection? When they were last inspected?	indicate periodicity and date	
1.6	Is the water refilling arrangement in the fire tenders properly maintained?	Yes/ No	
1.7	Is availability of all consumables like Fire hose, branches, nozzles, wheels etc properly maintained?	Yes/ No	
1.8	How many fire crew/ personnel available (in numbers)	indicate numbers	
1.9	How many portable pumps are available?	indicate numbers	
1.10	How many foam generators are available?	indicate numbers	
1.11	How many portable DG sets are available?	indicate numbers	
1.12	Is availability of emergency lights, breathing apparatus, portable foam generators properly maintained?	Yes/ No	
1.13	Please mention about Healthiness of the following:		
1.13.1	Hydrant systems	Yes/ No	
1.13.2	Fire water pipelines	Yes/ No	
1.13.3	Sprinkler systems	Yes/ No	
1.13.4	Sprinkler system pipelines	Yes/ No	
1.13.5	Water monitors	Yes/ No	
1.14	whether adequate fire protection system deployed/adopted in different equipment/systems of the power plants?	Yes/ No	
1.15	Is Internal and external Public Address system in place and properly functioning?	Yes/ No	
1.16	What is the periodicity of checking of Fire Detection system?	indicate periodicity	
1.17	Is the transformer meant for Fire fighting system in healthy condition?	Yes/ No	
1.18	Is fire fighting system for Main Oil Tank in healthy condition?	Yes/ No	
	Is fire fighting system for Generator in healthy condition?	Yes/ No	
1.19	Is fire fighting system for Turbine in healthy condition?	Yes/ No	
1.2	Is the fire fighting system of cables in healthy condition?	Yes/ No	
1.21	Is the fire fighting system in Cable galleries in healthy state? What is the effectiveness of smoke detectors?	Yes/ No	
1.22	Are the exhaust fans in cable gallery functional and in healthy state?	Yes/ No	
1.23	Periodicity of inspections of fire fighting system in Cable gallery? When was it last inspected?	indicate periodicity and date	
1.24	Is Fire fighting system in Main Control Room, Control room, Switchyard control room/Pothead yard Area in healthy state?	Yes/ No	
1.25	When was the sprinkler systems last inspected? Please give details area wise?	indicate details	
1.26	Is any firefighting mock drill carried out? Last date of mock drill	Yes/ No	
1.27	What are the observations of fire mock drills for the last 6 months and their compliance status?	indicate details	
1.28	Are portable fire extinguishers installed and maintained as per IS 2190?	Yes/ No	
1.29	Are all the PFEs (Portable Fire Extinguishers) accessible? Are the PFEs obstructed by storage of materials and numbered for easy identification?	Yes/ No	
1.3	Is use of Fire extinguishers training given to Staff including security guards?	Yes/ No	
1.31	whether sprinkler system is provided as per the requirement?	Yes/ No	
1.32	whether sprinkler valve and flow switch are available and tested?	Yes/ No	
1.33	whether Sprinkler heads are missing / plugged?	Yes/ No	
1.34	whether Sprinkler piping and heads spacing are as per the requirement of IS 15105?	Yes/ No	

Annex B

1.35	Are the trained personnel available at all times for operating the hydrant system and fire-fighting system?	Yes/ No	
1.37	whether the space above the false ceiling and the space under the raised flooring are provided with smoke detectors? Are the response indicators provided for these detectors? Access available for detectors provided above false ceiling?	Yes/ No	
1.38	whether FDA system is interlocked with HVAC blower, Fire dampers and access control system?	Yes/ No	
1.39	whether FDA alarm hooter is provided in all areas?	Yes/ No	
1.4	whether Manual Call Point is provided in all Entry / Exit at each floor?	Yes/ No	
1.42	whether Manual release and Abort switches are provided at the facility entry and easily accessible?	Yes/ No	
1.43	whether adequate pressure available in the cylinder and Audio visual alarm provided?	Yes/ No	
1.44	whether Smoke extraction system is provided and interlocked with FDA system?	Yes/ No	
1.45	Are the fire protection and detection system maintained as per the standard requirement? Mention the last date of maintenance and servicing agency name - Fire Hydrant system - Sprinkler system - Gas suppression system - Fire detection and alarm system - Smoke extraction system	Indicate dates and details	
1.48	whether Fire doors are provided for Electrical panel room ? Fire doors are provided for Emergency Exits and Duct inspection doors?	Yes/No	
1.49	whether false floor and ceiling are made of fire retardant material?	Yes/ No	
1.5	whether vertical and horizontal opening between floors of a building and rooms are sealed to prevent spread of smoke and fire?	Yes/ No	
1.52	Whether Electrical Panels / Cabinets are protected by adequate detection and suppression system ?	Yes/ No	
1.53	Whether Cable trenches / Cable ducts / Cable Cellar are protected with detection and suppression system ?	Yes/ No	
1.57	Whether adequate Fire Prevention / Suppression system is provided for Oil filled Transformers ?	Yes/ No	
<b>2 Any other issues in Fire Detection, Protection and Maintenance System</b>			