भारत हेवी इलेक्ट्रिकल्स लिमिटेड
(भारत सरकार का उपक्रम)
BHARAT HEAVY ELECTRICALS LIMITED
(A Govt. of India Undertaking)

TCN – 09

Ref: PSER:SCT:SDG-C2062:TCN-09 Date: 07-09-2020

Sub	Tender Change Notice (TCN) – 09.	
Job	Civil, Structural & Architectural works for Main Plant & BOP (excluding piling and levelling & grading work) for 1x660 MW, Unit no. 5, WBPDCL Sagardighi TPP Extension Project.	
Ref	1.0	Tender no PSER:SCT:SDG-C2062:20.
	2.0	BHEL's NIT, vide reference no PSER:SCT:SDG-C2062:8055, Date: 18-07-2020.
	3.0	BHEL's TCN-01, vide reference no PSER:SCT:SDG-C2062:TCN-01, Date: 27-07-2020.
	4.0	BHEL's TCN-02, vide reference no PSER:SCT:SDG-C2062:TCN-02, Date: 03-08-2020.
	5.0	BHEL's TCN-03, vide reference no PSER:SCT:SDG-C2062:TCN-03, Date: 10-08-2020.
	6.0	BHEL's TCN-04, vide reference no PSER:SCT:SDG-C2062:TCN-04, Date: 13-08-2020.
	7.0	BHEL's TCN-05, vide reference no PSER:SCT:SDG-C2062:TCN-05, Date: 14-08-2020.
	8.0	BHEL's TCN-06, vide reference no PSER:SCT:SDG-C2062:TCN-06, Date: 20-08-2020.
	9.0	BHEL's TCN-07, vide reference no PSER:SCT:SDG-C2062:TCN-07, Date: 27-08-2020.
	10.0	BHEL's TCN-08, vide reference no PSER:SCT:SDG-C2062:TCN-08, Date: 28-08-2020.
	11.0	All other pertinent issues till date.

With reference to above, following points/documents, relevant to tender, may please be noted and complied with while submitting the offer.

1. Revised Volume-ID-SCC-HSE PLAN FOR SUBCONTRACTORS-REV-02 attached, superseding Volume-ID-SCC-HSE PLAN FOR SUBCONTRACTORS-REV-01 issued earlier along with TCN-01.

2. Revised `No deviation certificate' as per enclosed Annexure-2. Bidder shall submit no deviation certificate as per enclosed format only.

3. All other terms & conditions shall remain unchanged.

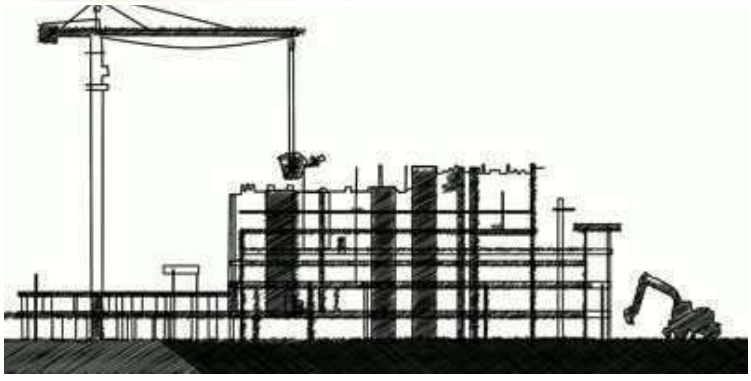
Thanking you,

Yours faithfully,
for BHARAT HEAVY ELECTRICALS LTD

SR. ENGR (SCT)

Encl : As above.

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)
POWER SECTOR EASTERN REGION, DJ-9/1, SECTOR-II, SALT LAKE CITY, KOLKATA - 700 091
फैक्स/Fax : (033) 23211960 फोन/Phone : बोर्ड/EPABX : (033) 2339-8000/ 2339 8231



HEALTH, SAFETY and ENVIRONMENT PLAN

For

SITE OPERATIONS

By

SUB-CONTRACTORS

For

SAGARDIGHI

POWER SECTOR- EASTERN REGION

DOCUMENT ISSUE SHEET

	PREPARED BY	APPROVED BY
NAME	SASWAJEET ROUT	BISHWANATH TIRKEY
DESIGNATION	DEPUTY MANAGER (HSE), PSER-HQ, KOLKATA	ADDL. GM (HSE), PSER-HQ, KOLKATA
SIGNATURE		
ISSUED BY: SASWAJEET ROUT, DEPUTY MANAGER (HSE), PSER-HQ, KOLKATA		
ISSUED TO: SAGARDIGHI PROJECT, PSER		
COPY NO: E-Copy		
DATE OF ISSUE: 01.09.2020		

THIS PLAN IS EXCLUSIVELY FOR SAGARDIGHI PROJECT AND IT SUPERSEDES THE STANDARD HSE PLAN

HSE PLAN FOR SITE OPRATIONS FOR SAGARDIGHI AT A GLANCE

BEFORE START	**SIGNING OF MOU**	
	Agree to comply to HSE requirement- Statutory and BHEL's	Agree to accept BHEL's decision on release of 1.5% (as specified in the contract) of Gross bill amount or part thereof or otherwise (non-release), based on our HSE performance as evaluated by BHEL during the execution period.
PLAN	**HSE ORGANISATION**	
	Manpower (As per Cl. 7.1) • **1 (one) safety officer for every 300 workers or part thereof** • **1(one) safety-supervisor for every 150 workers or part thereof** • **1(one) safety-steward/ supervisor for every 50 workers of part thereof**	**HSE Roles and responsibilities** • All employees as per 7.2.1 • Site In-charge & Package In-charges- As per clause 7.2.2 • Safety officer- As per clause 7.2.3
	HSE PLANNING For Man, Machinery/ Equipment/ Tools & Tackles	
PROVIDE	**HSE INFRASTRUCTURE**	
	• PPEs • Drinking Water • Washing Facilities • Latrines and Urinals • Provision of shelter for rest • Medical facilities	• Canteen facilities • Labor Colony • Emergency Vehicle • Pest Control • Scrapyard • Illumination • Crèches (if required)
TRAIN	**HSE TRAINING, AWARENESS & PROMOTION**	
	Training • Induction training • Height work and other critical areas • Tool Box talk & Pep Talk • Job Specific Training	**Awareness & Promotion** • Posters & Signage • Emergency Contact/Information Display • Banner • Competition & Awards
COMMUNICATE	**HSE COMMUNICATION**	
	Incident Reporting • Accident- Fatal, Major & Minor • Property damage • Near Miss **Safety Performance Reporting**	**Event Reporting** • Celebrations • Training • Medical camp • Motivational Activities

EXECUTE SAFELY	**SAFETY DURING WORK EXECUTION**	
	PERMIT TO WORK General Work, Height work (above 2 meters), Hot Work, Confined Space, Radiography, Excavation (More than 1.22 meters), Radiography, Heavy/ Critical Lifting, Night/ Holiday Work, Material loading/ unloading, Grating/ Safety Net/ Safety facility removal, Lockout / Tag out, Beam/ Truss/ Duct/ Structure Alignment	
	OPERATIONAL CONTROL	
	• Welding, Gas Cutting Grinding • Rigging, Signaling • Cylinder- Storage & Movement • Demolition work • T&Ps • Chemical Handling • Electrical works • Painting	• Fire • Scaffolding • Height work • Working Platform • Excavation / Civil Work • Ladder • Lifting • Hoisting appliance • Hard Barricading
	HOUSE KEEPING	
	WASTE MANAGEMENT	
	TRAFFIC MANAGEMENT	
	ENVIRONMENTAL CONTROL	
	EMERGENCY PREPAREDNESS AND RESPONSE PLANNING	
CHECKS	**HSE AUDITS & INSPECTION**	
	• Daily Checks • Inspection of Height work • Inspection of PPEs • Inspection of T & Ps	• Inspection of Cranes & Winches • Inspection of Welding and Gas cutting • Inspection of elevators etc.
	HSE PERFORMANCE EVALUATION PARAMETERS	
NON-CONFORMANCE	**PENALTY FOR NON-CONFORMANCE** **Refer Clause 16 Incremental penalty** For repeated violation by the same person, the penalty would be double of the previous penalty. For repeated fatal incident in the same contract/ package, incremental penalty to be imposed. The sub-contractor will pay 2 times the penalty compared to the previously paid in case there are repeated cases of fatal incidents under the same sub-contractor for the same package in the same unit.	
	COMPENSATION TO ACCIDENT VICTIMS **Refer Clause 17** **Employee Compensation Act, 1922** **Other Acts and Guidelines relevant to employee compensation**	

ORGANIZATION OF THIS DOCUMENT

- ***GENERAL SECTION***
- ***SECTION A:***
  MAIN REQUIREMENTS APPLICABLE IN FULL
- ***SECTION B:***

  SPECIAL REQUIREMENTS
- ***ANNEXES***

CONTENTS

GENERAL

1. PURPOSE

1.0 The purpose of this HSE Plan is to provide for the systematic identification, evaluation, prevention and control of general workplace hazards, specific job hazards, potential hazards and environmental impacts that may arise from foreseeable conditions during installation and servicing of industrial projects and power plants.

1.1 This document shall be followed by BHEL as well as BHEL's Sub-Contractors at all installation and servicing sites. In case BHEL has contractual HSE obligations towards customer, this document will be followed in conjunction with (BHEL's) customer specific requirements, ensuring that applicable systems, controls and checks of both are implemented in letter and spirit.

1.2 In case the customer has any specific requirement, the same is to be fulfilled but may not include financial inclusion.

1.3 Although every effort has been made to make the procedures and guidelines in line with statutory requirements, in case of any discrepancy relevant statutory guidelines must be followed.

2. SCOPE

Project Highlights:

- Name of the project : Construction of 1X660MW U#5 EXTENSION Power plant (EPC Package)
- Client : WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED
- Location : SAGARDIGHI TPS, DIST- MURSHIDABAD, WEST BENGAL
- Contractor : Bharat Heavy Electricals Ltd.

The document is applicable for installation and commissioning of Boiler, Turbine, Electrical Systems, AHP, CHP, Misc. BOP areas, FGD of 1x660MW rating as per the relevant contractual obligations, and provides the minimum HSE requirements to be followed at the project site and at labour colony. It will be applicable for all the managerial, supervisory, professional, technical, clerical and other workers including contract laborers; and equipment operating under the control of BHEL's Subcontractors at site as per the relevant contractual obligations. As an item of note, this HSE Plan is considered a living document and will be revised as/if necessary, to ensure contract and regulatory compliance requirements are met during the performance of work on the project.

3. OBJECTIVES

The HSE Plan reflects that BHEL places high priority upon the Occupational Health, Safety and Environment at workplaces. BHEL and its sub-contractor are committed to:

Health & Safety

- Prevent injury and ill health of all persons at site ('Persons' refers to all personnel including managerial, supervisory, professional, technical, clerical and other workers including contract laborers)

Environment

- Prevent pollution to environment and ensure protection of environment taking into account interested party concern and conservation of resources and reduction of wastage

Legal Requirements

- Comply at all times with the relevant statutory and contractual HSE requirements.

Planning & Resources

- Ensure that all work planning takes into account all persons that may be affected by the work.
- Ensure timely provision of resources to facilitate effective implementation of HSE requirements.

Competency, Training & Awareness

- Provide trained, experienced and competent personnel. Ensure medically fit personnel only are engaged at work.
- Provide all personnel with adequate information, instruction, training and supervision on the safety aspect of their work.

Maintenance of Equipment

- Ensure fitness testing of all T&Ps. Lifting appliances like cranes, chain pulley blocks etc. are certified by competent authority.

Safety during Operations

- Provide and maintain plant, places and systems of work that are safe and without risk to health and the environment.
- Effectively control, co-ordinate and monitor the activities of all personnel on the Project sites including subcontractors in respects of HSE.
- Establish effective communication on HSE matters with all relevant parties involved in the Project works.

HSE Improvement

- Capture the data of all incidents including near misses, process deviation etc. Investigate and analyze the same to find out the root cause
- Ensure timely implementation of correction, corrective action.
- Ensure continual improvement in HSE performance

GOALS AND TARGETS

- **To achieve "Zero Incident at Site" (LTI)**
- **100% compliance of all legal/statutory requirements related to HSE.**
- **100% Health, Safety and Environmental Induction training attendance for all workers.**
- **100% High Risk activities to be carried out only after approved Method Statement, HIRA / Aspect-Impact / JSA / OCP and Permit to Work are implemented.**
- **100% PPEs compliance in high and medium risk activities.**
- **100% monitoring of all Work Areas**
- **100% detection of non-conformities in work area and 100% closure within specified time**
- **100% incident (near miss, minor, major, other) reporting, recording and reviewing for corrective actions.**
- **Regular Safety Reviews to assess HSE program compliance and 100% closure of any recognized gaps to continually improve safety management and incident prevention.**

4. REFERENCES

1. ALL CONTRACTUAL HSE REQUIREMENTS INCLUDING THIS DOCUMENT
2. ALL APPLICABLE ACTS, RULES & REGULATIONS
3. BHEL POWER SECTOR HSE MANAGEMENT SYSTEM
   I. HSE PROCEDURES (13.1.1)
   II. WORK PERMITS (See Clause 13.1.2)
   III. OPERATIONAL CONTROL PROCEDURES (See Clause 13.1.3)
   IV. FORMATS (See Clause 21)
4. BHEL CORPORATE STANDARD PPE GUIDELINES
5. RELEVANT INDIAN STANDARDS FOR SAFETY (See Annexure 01)

(Note: Wherever, the date or revision number of a document is not mentioned, latest revision is implied)

5. BHEL HEALTH, SAFETY & ENVIRONMENT POLICY:

In BHEL, Health, Safety and Environment (HSE) responsibilities are driven by our commitment to protect our employees and people we work with, community and environment. BHEL believes in zero tolerance for unsafe work/non-conformance to safety and in minimizing environmental footprint associated with all its business activities. We commit to continually improve our HSE performance by:

- Developing safety and sustainability culture through active leadership and by ensuring availability of required resources.
- Ensuring compliance with applicable legislation, regulations and BHEL systems.
- Taking up activities for conservation of resources and adopting sound waste management by following Reduce/Recycle/Reuse approach.
- Continually identifying, assessing and managing environmental impacts and Occupational Health & Safety risks of all activities, products and services adopting approach based on elimination/ substitution/reduction/control.
- Incorporating appropriate Occupational Health, Safety and Environment criteria into business decisions, design of products & systems and for selection of plants, technologies and services.
- Imparting appropriate structured training to all persons at workplace and promoting awareness amongst customers, contractors and suppliers on HSE issues.
- Reviewing periodically this policy and HSE Management Systems to ensure its relevance, appropriateness and effectiveness.
- Communicating this policy within BHEL and making it available to interested parties.

Date: 05.06.2018

Atul Sobti
Chairman & Managing Director

6. TERMS AND DEFINITIONS

6.0 INCIDENT

Work- related or natural event(s) in which an injury or ill health (regardless of severity) or fatality, damage to property/environment occurred, or could have occurred.

6.1 NEAR MISS

An incident where no ill health, injury, damage or other loss occurs, but it had a potential to cause, is referred to as “Near-Miss incident”.

6.2 MAN-HOURS WORKED

The total number of employee hours worked by all employees including subcontractors working in the premises.

It includes managerial, supervisory, professional, technical, clerical and other workers including contract laborers.

Man-hours worked shall be calculated from the payroll or time clock recorded including overtime. When this is not feasible, the same shall be estimated by multiplying the total man-days worked for the period covered by the number of hours worked per day. The total number of workdays for a period is the sum of the number of men at work on each day of period. If the daily hours vary from department to department separate estimate shall be made for each department and the result added together.

6.3 FIRST AID CASES

First aid cases include:

1. Visit to a physician or a licensed health care professional solely for observation or counselling
2. Conduct of diagnostic procedures like X rays, blood test including the prescription medications used solely for diagnostic purposes (e.g. eye drops to dilate eyes)
3. Using a non-prescription medicine at non-prescription strength (for medication available in both prescription and non-prescription form as recommendation by a physician or other licensed health care professional to use a non-prescription medication at prescription strength is considered medical treatment for record keeping purposes};
4. Administering tetanus immunizations (other immunizations, such as Hepatitis B vaccine or rabies vaccine, are considered medical treatment);
5. Cleaning, flushing or soaking wounds on the surface of the skin;
6. Using wound coverings such as bandages, Band-Aids TM, gauze pads, etc.; or using butterfly bandages or steri-strips TM (other wound closing devices such as sutures, staples, etc., are considered medical treatment);
7. Using hot or cold therapy;
8. Using any non-rigid means of support, such as elastic bandages, wraps, non-rigid back belts, etc. (devices with rigid stays or other systems designed to immobilize parts of the body are considered medical treatment for record-keeping purposes);

9. Using temporary immobilization devices while transporting an accident victim (e.g., splints, slings, neck collars, back boards, etc.).
10. Drilling of a fingernail or toenail to relieve pressure, or draining fluid from a blister;
11. Using eye patches;
12. Removing foreign bodies from the eye using only irrigation or a cotton swab;
13. Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs or other simple means;
14. Using finger guards;
15. Using massages (physical therapy or chiropractic treatment are considered medical treatment for recordkeeping purposes); or
16. Drinking fluids for relief of heat stress.

No other treatments are considered first aid.

6.4 MEDICAL TREATMENT CASES

An incident involved with an injury or illness that needs medical attention beyond First-aid as per 6.3 above.

6.5 TYPE OF INCIDENT / ACCIDENT & THEIR REPORTING:

The categories of Incident / accident are as follows:

Non-Reportable Cases:

An accident, where the injured person is given first aid and discharged for work without counting any lost time.

Reportable Cases (LTI or Loss Time Injury Cases):

Minor: In this case the injured person resumes duty within 48 hours of incident

Major: In this case the injured person is disable for 48 hours or more and is not able to perform his duty. (As per IS 3786)

6.6 TOTAL REPORTABLE FREQUENCY RATE

Frequency rate is the number of Reportable Lost Time Injury (LTI) per one Million Man hours worked. Mathematically, the formula read as:

$$\frac{\text{Number of Reportable LTI}}{\text{Man Hours Worked}} \times 1{,}000{,}000 \text{ Total}$$

6.7 SEVERITY RATE

Severity rate is the Number of days lost due to Lost Time Injury (LTI) per one Million Man hours worked. Mathematically, the formula reads as:

$$\frac{\text{Days lost due to LTI}}{\text{Total Man Hours Worked}} \times 1{,}000{,}000$$

6.8 FREQUENCY SEVERITY INDEX (FSI)

Frequency Severity Index, FSI $= \sqrt{FR * SR/1000}$

6.9 INCIDENCE RATE

Incidence Rate is the Number of LTI per one thousand manpower deployed. Mathematically, the formula reads as:

$$\frac{\text{Number of LTI} \times 1000}{\text{Average number of manpower deployed}}$$

6.10 JOB SAFETY ANALYSIS

A job safety analysis (JSA) is a procedure which helps integrate accepted safety and health principles and practices into a particular task or job operation. In a JSA, each basic step of the job is to identify potential hazards and to recommend the safest way to do the job. Other terms used to describe this procedure are job hazard analysis (JHA) and job hazard breakdown.

6.11 SAFETY WALK

It's a walk (conducted periodically) by an official through a portion or whole of a site as an HSE officer, noting down HSE observations, speaking to concerned workmen and supervisor on observation, recording and reporting to in charges of agencies, getting the same rectified with personal follow up - to send out a strong message on Management's commitment to safety.

6.12 HEAVY & COMPLEX LIFTING

A heavy and complex lifting activity includes:

1. Lifting above 20 Tons
2. Tandem Lifting using multiple cranes
3. Total load exceeding 85% of capacity of crane
4. Lift of unusual difficulty or geometry or rigging
5. Lift over operating units
6. Any other lift as decided by site HSE / Erection

In any case, Job Safety Analysis to be carried out for any lifting activity.

6.13 SAFETY COMMITTEE

As per the BOCW, Safety Committee shall be constituted if there are more than five hundred or more construction workers are employed at any site. As per the Factories Act, 1948 it is for 250 workers. It shall be represented by equal number of representatives of employer and construction workers.

6.14 NIGHT WORK

Work conducted after sunset when only a fraction of total manpower is available

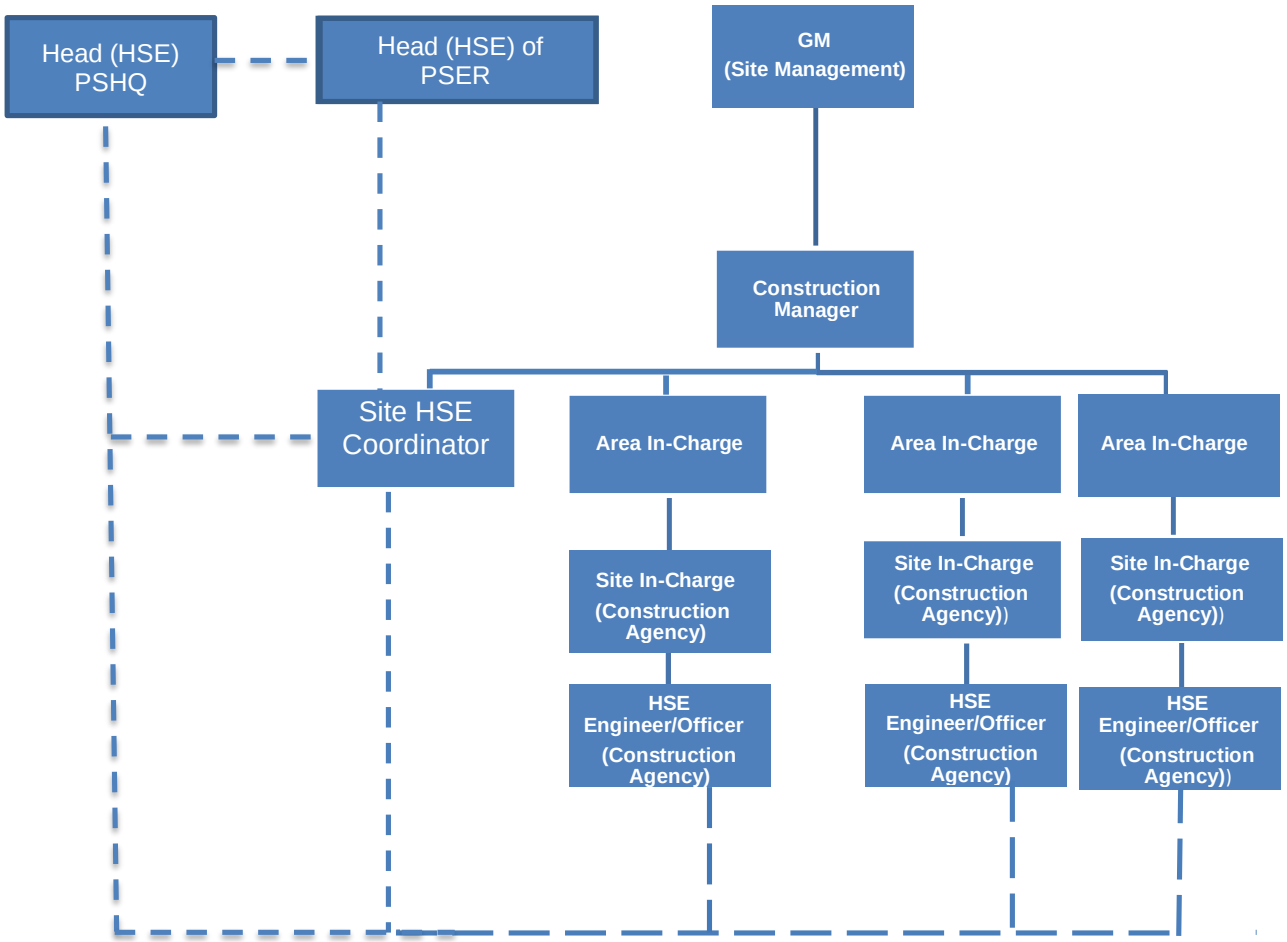
Section-A

Main Requirements

(Applicable in Full)

7. HSE ORGANISATION

7.1 ORGANIZATION CHART



7.2 DEPLOYMENT:

7.2.1 Minimum Number (Availability per contract/ package per working shift)

7.2.1.1 HSE Officer	7.2.1.2 HSE Supervisor	7.2.1.3 HSE Steward / Observer
1 per 300 workers or part thereof as a minimum or as mandated by applicable legal requirements, whichever more stringent	1 per 150 workers or part thereof	1 per 50 workers or part thereof

7.2.1.4 The safety officers shall be engaged directly by the sub-contractor, whereas safety supervisors and safety stewards may be from the agencies engaged by the sub-contractor.

7.2.1.5 Deployment Plan:

7.2.1.5.1 These shall be minimum one HSE officer along with HSE supervisor and HSE steward in the aforesaid ratio for every shift for each unit of Boiler/ESP/Power House & TG/ Chimney/ Whole of Cooling Tower.

7.2.1.5.2 For Civil works and other BOP items, deployment shall be broadly as specified in the above table. But BHEL shall finally approve the deployment based on nature and volume of jobs, Risks and hazards associated etc.

7.2.1.5.3 The deployment plan of Safety manpower at various locations shall be submitted to BHEL for approval by subcontractor

BHEL reserves the right to demand more safety personnel than what is stipulated here and change the deployment pattern.

7.2.2 QUALIFICATION & EXPERIENCE

All Degrees/ Diplomas shall be recognized by State Council for Technical Education & Vocational Training (SCTE & VT) / All India Council for Technical Education (AICTE) / University

7.2.2.1 HSE Officer	7.1.2.2 HSE Supervisor	7.1.2.3 HSE Steward / Observer
A. i. Recognized degree in any branch of Engg. or Tech. or Architecture with practical experience of working in a building or other construction work in supervisory capacity for a period of not less than two years, or Recognized diploma in any branch of Engg. or Tech with practical experience of working in a building or other construction work in supervisory capacity for a period of not less than five years. ii. Recognized degree or diploma in Industrial safety ii. (Preferably) have adequate knowledge of the language spoken by majority of the workers at the construction site. **Alternatively:**	As a minimum, (s)he shall possess: A recognized graduation Degree in Science (with Physics & Chemistry) or a recognized diploma in Engg. or Tech. with: a. Minimum Two years of practical experience in construction work environment and b. Should possess requisite skills to deal with construction safety & fire related day-to-day issues.	As a minimum, (s)he shall possess: 1. Class XII pass certificate and 2. Trained in fire-fighting as well as in safety / occupational health related subjects, with: a. Minimum two year of practical experience in construction work environment and b. Should have adequate knowledge of the local language spoken by majority of the workers at the construction site.

B. Graduation Degree in Science with Physics & Chemistry and degree or diploma in Industrial Safety (from any Indian institutes recognized by AICTE or State Council of Tech. Education of any Indian State) with practical experience of working in a building, plant or other construction works (as Safety Officer, in line with Indian Factories Act, 1958) for a period of not less than five years.		

7.2.3 HSE IN-CHARGE

In case there are more than one HSE officers with any sub-contractor, one of them, who is senior most by experience (in HSE discipline), may be designated as HSE In-Charge. Duties & responsibilities of such person shall be commensurate with that of relevant statute and primarily to coordinate with top management of Client and sub-contractors.

7.2.4 AVAILABILITY AND PENALTY FOR NON-DEPLOYMENT:

Subcontractor shall ensure physical availability of safety personnel at the place of specific work location including where Height Work Permit is required/granted. No work shall be started in any area until above safety personnel & concerned Site Engineer of subcontractor are physically deployed at site.

The Subcontractor shall prepare an organization chart identifying the areas of operations, responsibilities and reporting structure of all safety personnel and submit the same to BHEL.

The subcontractor shall deploy sufficient safety officers, supervisors and safety-stewards, as per numbers & qualifications mandated in this Section since mobilization of first batch of manpower and add more in proportion to the added strength in work force. Any delay in deployment will attract a penalty at following rates:

Non-deployment of HSE Officer	–	**Rs. 50,000 per man-month**
Non-deployment of HSE Supervisor	–	**Rs. 30,000 per man-month**
Non-deployment of HSE Steward	–	**Rs. 20,000 per man-month**

Penalty shall be collected for the period of non-availability of safety personnel after allowing a grace period of 15 days for finding a replacement.

7.2.5 COMPETENCY OF OPERATORS/ DRIVERS OF CRANE, WINCH, CONSTRUCTION/ LIFTING EQUIPMENT ETC.:

The Operators/ Drivers of crane, winch, construction/ lifting equipment etc. shall be experienced and have valid driving license for the class of vehicle / machinery as applicable (like Crane/ Forklift/ Rig driving license etc.). Minimum HMV driving license is required for all heavy equipment operators at site. The sub-contractor shall certify competence of these persons in writing as and when they join. Crane, Winch, Construction & lifting equipment operator should have certificate on subject course or owner experience certificate in letterhead.

7.2.6 In case the statutory requirements i.e. State or Central Acts and / or Rules as applicable like the Building and Other Construction Workers' Regulation of Employment and Conditions of Service-Act,1996 or State Rules (wherever notified), the Factories Act, 1948 or Rules (wherever notified), etc. are more stringent than above clarifications, the same shall be followed.

7.2.7 **BILLING:** Deployment of Safety manpower as per this clause **shall be** a billable item.

7.2.8 The Subcontractor shall verify & authenticate credentials of the HSE personnel detailed in this Section and furnish Bio-Data/Resume / Curriculum Vitae of the safety personnel as above for BHEL / Owner's approval, at least 1 month before the mobilization. The Subcontractor, whenever required, shall arrange submission of original testimonials / certificates of their Safety personnel, to BHEL / Owner (for verification/scrutiny, etc.)

7.2.9 Prior approval of CVs by BHEL for Safety Officer and Safety Supervisor is mandatory, however BHEL has right to check suitability of Safety Stewards as well.

7.3 RESPONSIBILITIES

The subcontractors shall communicate the HSE responsibilities as indicated in this section to relevant employees in written Form and ensure awareness of the same

7.3.1 ALL EMPLOYEES

1. To be aware of, get involved in and ensure implementation of all HSE related Systems and Procedures including but not limited to:
    a) BHEL HSE Management System including HSE Procedures and OCPs
    b) Work Permit System
    c) Emergency Preparedness Response Plans
    d) Contractual HSE requirements
    e) Legal Requirements
    f) Penalty System
    g) Training requirements
2. To ensure that the persons engaged in respective area follow the safety rules like using appropriate PPEs.
3. To keep track of repetitive minor or major incident observation/ report and submit to BHEL.
4. To prepare HIRA / JSA as required and submit to BHEL for verification.
5. To record all incidents including near miss and report to BHEL.
6. To adopt safe working practices at all times and act as role model for Safety
7. To take immediate corrective action actions in case any non-conformity is observed on product / process / system with respect to Occupational Health, Safety and Environment.
8. In case any particular activity / work has extremely high consequential risk or high environmental impact, same shall be brought to the notice of BHEL Package In-charge before starting the work.
9. To interfere/ stop work as & when identified unsafe.
10. To maintain & promote improved level of house-keeping all the time at site.
11. To support/co-operate with audit team members as & when safety audits are carried out.
12. To involve in investigation, if any incident occurs in his work area.
13. To participate in safety promotional programs.
14. To attend the safety committee meeting, if member/ invitee

15. To ensure that only fit T&Ps and qualified persons are engaged for all activities.
16. Shall ensure that person working above 2.0 meter should use Safety Harness tied to a life line/stable structure.
17. Shall ensure that materials are not thrown from height. Cautions to be exercised to prevent fall of material from height.
18. Shall ensure that all T&Ps engaged are tested for fitness and have valid certificates from competent authorities.

7.3.2 SITE IN –CHARGE & PACKAGE IN-CHARGES OF SUBCONTRACTOR

1. All requirements as per 7.3.1
2. Shall ensure fulfillment of HSE requirements of BHEL contract as given in this document.
3. Shall engage qualified safety manpower as per this document at all times.
4. Shall adhere to the rules and regulations mentioned in this document, practice very strictly in his area of work in consultation with his concerned engineer and the safety coordinator.
5. Shall screen all workmen for health and competence requirement before engaging for the job and periodically thereafter as required.
6. Shall ensure that all the workers are engaged after undergoing induction training.
7. Shall arrange for all necessary PPEs like safety helmets, belts, full body harness, shoes, face shield, hand gloves etc. before starting the job. Shall ensure that no working men /women carry excessive weight more than stipulated in Factory Rule Regulation R57.
8. Shall ensure that provisions stipulated in contract Labor Regulation Act 1970, Chapter V C.9, canteen, rest rooms/washing facilities to contracted employees at site.
9. Shall report all incidents (Fatal/Major/Minor/Near Miss) to the Site engineer /HSE officer of BHEL.
10. Shall conduct Safety Walks and safety inspections, and act as a role model for Safety.
11. Shall ensure that Horseplay is strictly forbidden.
12. Shall ensure that adequate illumination is arranged during night work.
13. Shall ensure that all personnel working under subcontractor are working safely and do not create any Hazard to self and to others.
14. Shall ensure display of adequate signage/posters on HSE.
15. Shall ensure that mobile phone is not used by workers while working.
16. Shall ensure conductance of HSE audit, mock drill, medical camps, induction training and training on HSE at site
17. Shall ensure full co-operation during Client/External /Customer HSE audits.
18. Shall ensure submission of look-ahead plan for procurement of HSE equipment’s and PPEs as per work schedule.
19. Shall ensure adequate valid fire extinguishers are provided at the work site.
20. Shall ensure availability of sufficient number of toilets /restrooms and adequate drinking water at work site and labor colony.
21. Shall ensure adequate emergency preparedness
22. Site In-charge also involve in the induction training so as to share knowledge of some incident and guide the worker to perform work safely.
23. Shall ensure power source for hand lamps shall be maximum of 24 v.

24. Shall ensure temporary fencing should be done for open edges if Hand – railings and Toe-guards are not available.
25. Shall be responsible for the periodic testing of T&Ps (winches / crane /hydra/tools/equipment so on.) and Pressure Vessels as per applicable codes and submit report to BHEL
26. Shall be member of site HSE committee and attend all meetings of the committee

7.3.3 HSE OFFICER OF SUBCONTRACTOR

1. All requirements as per 7.3.1
2. Carry out safety inspection of Work Area, Work Method, Men, Machine & Material, P&M and other tools and tackles.
3. Facilitate HIRA and Aspect/Impact Study in the area and ensure control measures.
4. Highlight the requirements of safety through Tool-box / other meetings.
5. Help concerned HOS to prepare Job Specific instructions for critical jobs.
6. Maintain record and conduct investigation of all incident/dangerous occurrences & recommend appropriate safety measures.
7. Advice & co-ordinate for implementation of HSE permit systems, OCPs & MPs.
8. Convene HSE meeting & minute the proceeding for circulation & follow-up action.
9. Plan procurement of PPE & Safety devices and inspect their healthiness.
10. Report to BHEL on all matters pertaining to status of safety and promotional programmes at site level.
11. Encourage raising Near Miss Report on safety along with, improvement initiatives on safety.
12. Facilitate administration of First Aid
13. Facilitate screening of workmen and safety induction.
14. Conduct fire Drill and facilitate emergency preparedness
15. Design campaigns, competitions & other special programs to promote safety in the workplace.
16. Notify non-conformance to safety norms observed during site visits / site inspections.
17. Recommend to Site In-charge, immediate discontinuance of work until rectification, of such situations warranting immediate action in view of imminent danger to life or property or environment.
18. To decline acceptance of such PPE / safety equipment that do not conform to specified requirements.

7.3.4 HSE SUPERVISOR OF SUBCONTRACTOR

1. All requirements as per 7.3.1
2. To assist Safety officer

7.3.5 HSE STEWARD / OBSERVER OF SUBCONTRACTOR

1. All requirements as per 7.3.1
2. To monitor allotted area for Safety violations, take required action and inform the concerned Safety Supervisor / Officer
3. To assist Safety Officer and Safety Supervisor

7.3.6 HSE DOCUMENTS, SYSTEMS & PROCEDURES:

BHEL shall provide the subcontractor soft copies of all applicable HSE Procedures, Work Permits, Operational Control Procedures, Formats and any other instructions required for the implementation of HSE Management System before commencing operations at site.

Subcontractor shall ensure the availability of the same.

7.3.7 IMPORTANT SITE EHS RULES RESULTING IN POSSIBLE EXPULSION FROM SITE

- Pre-employment Medical fitness is compulsory for all workers.
- EHS induction in mandatory for all new workers, supervisor and engineers, subcontractor managers etc.
- No visitors are allowed for site visit without safety induction.
- **Mandatory PPEs are**
  - ✓ *Safety helmet with company logo*
  - ✓ *Hard toe safety shoes,*
  - ✓ *Safety goggles*
  - ✓ *Reflective vest*
  - ✓ *Full/half sleeve (at least 4-inch-long) shirt*
  - ✓ *Full length pant/trousers for male and preferably Salwar Kameez for female*

  All PPEs shall be ISO/EN standard compliant.

- **Zero Tolerance Safety Rules (Following are strictly prohibited)**
  - ✓ Violation of Fall protection / not anchoring & wearing safety harness above 6 feet,
  - ✓ Work without PTW
  - ✓ Child labor at site (<18 years)

- Use of cell phone particularly in hazardous/high risk jobs like height work, crane operation, etc. is strictly prohibited. Cell phone use in general while in the working areas on site is limited to designated mobile talking booths only. Encourage the people not to bring mobile phones inside the project premises, particularly smart phones.
- All vehicle being used at site to be in good condition in all respect.
- All electrical installations should have individual 30 mA ELCBs
- **Fighting**: Fighting anywhere on the Project site, including in parking areas, is strictly forbidden; violators will be barred from site and possibly subjected to legal action by local authorities.
- **Horseplay**: Running, pushing, practical jokes, and other horseplay are forbidden on the project site, including in parking areas.
- **Gambling**: Gambling on the Project site is not permitted
- **Alcohol & Drugs**: Intoxication or possession of alcohol or illegal drugs is strictly forbidden. Workmen under influence of liquor or drug or any other intoxication shall not be permitted to work and sent out of the work area.
- **Weapons**: Possession of weapons on the Project site is strictly prohibited
- **Asbestos Material**: No asbestos material is allowed to use in Project Site
- **Hair**: Anyone working on site property with scalp hair longer than the top of his/her shoulders must tie-up and restrains the hair within the hard hat or coveralls, shirt or jacket collar.
- **Jewelry**: Loose necklaces, dangling earrings and bracelets shall not be worn when working on the Project site.
- **Contact Lens**: While the site does not prohibit the wearing of contact lens, BHEL Project does not recommend their use.

- **Use of Empty Drums**: Use of empty drums to climb up and work is banned. Proper stool/ ladder/ stage required to be used if intended to work at height.
- Projects must comply in full with all applicable EHS local and national legislation. In circumstances where there is a conflict between local or national legislation and client requirements, the higher (more protective) requirement must prevail.
- All persons working on suspended scaffolds/cradles/gondolas must wear and use appropriate fall prevention equipment so as to protect them effectively at all times when they are at risk from any failure of any part of the scaffold/cradle/gondola, including its suspension system

- **Construction Trucks/Vehicles**
  - ✓ All the vehicles must have automatic back camera and back horn which should be connected with reverse gear.
  - ✓ Vehicles must be equipped with proper seat belts for driver and passengers. All persons riding in vehicles must be advised of the requirement that seat belts are to be used whenever the vehicles are being operated.
  - ✓ The subcontractor is responsible for assuring the overall safe condition of vehicles assigned to its projects.
  - ✓ The speed limit on the project site is a maximum of 20 Km/hr.
  - ✓ Any person found operating or driving in a reckless or careless manner without regard for the safety of other employees or the general public will be immediately removed for the equipment they were operating and permanently prohibited from operating or driving any equipment on the project.
  - ✓ Any mobile equipment found to be unsafe or defective must be immediately removed from service and sent for repair or replacement. The subcontractor must ensure that the proper repairs have been made prior to putting the equipment back into service.

- **Construction Material Handling Heavy Equipment**
  - ✓ All these equipment must have automatic back camera and back horn which should be connected with reverse gear.
  - ✓ No equipment may be modified without equipment manufacturer's authorization.
  - ✓ Rollover Protective Structures must be provided for all equipment as required.
  - ✓ Seat belts must be provided and used by operators of all equipment that has a Rollover Protective Structure.
  - ✓ All bi-directional equipment must be equipped with an operable horn that must be used as needed when the machinery is moving in either direction.
  - ✓ All bi-directional equipment must also have an operable alarm in addition to the horn.
  - ✓ All equipment must be provided with a multi-purpose (class A, B, and C) fire extinguisher mounted in an easily accessible location.
  - ✓ Braking systems, controls, safety devices must be maintained in effective operating condition.
  - ✓ The operator must inspect the equipment at the beginning of the shift and test for acceptable
  - ✓ Operation as per the equipment's manufacturer's instructions. Inspections must be documented and filed.
  - ✓ Only qualified personnel must be allowed to operate equipment. Qualification must be documented and filed.

In case any worker violates any of the EHS rules identified by BHEL as above, following punitive action shall be taken:

First Offence	Second Offence	Third Offence	Fourth Offence
Oral warning	*Gate Pass Punched*	*Gate pass punched (second)*	*Gate Pass Punched(third) and person sent out of the gate* *Photo of concerned worker to be displayed on Notice boards and prominent locations.*

BHEL has the right to send out such person even earlier than fourth offence after considering the severity of the offence and/or the person's track record related to following general/EHS rules.
BHEL reserves right to expel even concerned supervisor or engineer as well in case of repeat of such cases of indiscipline.

Note:
The appellate authority in this case shall be the BHEL Site In-charge whose decision shall be final on the matter and binding on all parties.

8. PLANNING FOR HSE

A. Identifying Hazards / Risks & Aspects / Impacts and implementing control measures

1. Subcontractor shall identify all OHS Hazards and Risks applicable to all activities in scope as per *HSEP01: HSE Procedure for OHS Hazards and Risks*, and plan & implement the required control measures.
2. Subcontractor shall identify all Environmental Aspects and Impacts applicable to all activities in scope as per *HSEP02: HSE Procedure for Environmental Aspects and Impacts*, and plan & implement the control measures.

B. Register of Regulations:

Subcontractor shall prepare a register of applicable rules and regulations in the scope as per *HSEP03: HSE Procedure for Register of Regulations* and plan to ensure compliance.
The detailed plans and registers in A and B to be submitted to BHEL for review and approval within 60 days of start of work at site.
Note: The plans above are dynamic and shall be periodically reviewed as per BHEL requirement.

8.1 MOBILISATION OF MACHINERY / EQUIPMENT / TOOLS

1. Subcontractor shall furnish to BHEL, the Test Certificates issued by the jurisdictional competent persons of machinery, equipment and other T&Ps to be deployed at site, before deployment. BHEL reserves the right to disallow the same if found non-conforming to HSE / legal requirements

2. As a further measure to ensure that machinery, equipment and tools being mobilized to the construction site are fit for purpose and are maintained in safe operating condition and comply with legislative and owner requirement, inspection shall be arranged by in-house expert / competent authority (preferable) for acceptance. (**Report Format: HSEP:13-F15)**
3. **The equipment considered for this purpose shall include all those in the T&P list in the tender document. Conventional Hydra crane with carriage in front shall not be permitted. Other models like FX or TRX series of Escorts or equivalent shall be permitted.**
4. In the course of work, the subcontractor shall notify the BHEL Engineer, of his intention to bring on to site any equipment or any container, with liquid or gaseous fuel or other substance which may create a hazard.
5. The Engineer shall have the right to prescribe the condition under which such equipment or container may be handled and used during the performance of the works and the subcontractor shall strictly adhere to such instructions.
6. The Engineer shall have the right to inspect any construction tool and to forbid its use, if in his opinion it is unsafe. No claim due to such prohibition will be entertained.
7. Following items to be deployed should be only ISO/IS certified, fit for the intended work and **shall not more than 2 yr. from the purchase date at the time of deployment at site**
    i. All lifting tools & tackles such as wire rope/web sling, D shackle/ Bow shackle etc. including chain pulley block. All chain pulley blocks should be with load indicators.
    ii. Grinding machine and wheel and buffing wheel
    iii. Gas cutting equipment
8. Following items to be deployed should be only ISO/IS certified, fit for the intended work and **shall not more than 3 yr. from the purchase date at the time of deployment at site**
    i. Modern Power Distribution Board/ Electrical Panel Board
9. Following items to be deployed should be only ISO/IS certified, fit for the intended work and **shall not more than 5 yr. from the purchase date at the time of deployment at site**
    1. Welding machine (Inbuilt VRD)
    2. Vibrator Machine
    3. Concrete cutter
    4. Electrically operated winch machine
10. **Office Infrastructure** - subcontractor shall arrange a computer / Laptop with Network connection, chair and table for HSE Staff to facilitate HSE reporting and recordkeeping.

8.2 MOBILISATION OF MANPOWER

1. As a measure to ensure that manpower being mobilized to the construction site is fit and competent for safe working, screening arrangement shall be made by the sub-contractor to ensure fulfillment of contractual as well as legislative requirement by:
    i. Ensuring the required qualification/ training/ certification/ license and experience for the job as per Section 7 of this document & applicable legal requirements
    ii. **Medical Checkup:** Examination of medical fitness shall be conducted through qualified medical professional for all workers to be deployed. (Record: Format No. HSEP13:F02)**.** For height workers, height phobia test to be carried out as qualification criteria.

iii. **Induction Training:** Induction training of all workers to be ensured as per clause 9.1 and HSEP04: *HSE Procedure for Training & Awareness (Record:* Format No. HSEP13:F03) Only on successfully meeting above criteria, permanent gate passes to be issued.

2. The subcontractor shall strictly adhere to the maximum daily working hours and other requirements as per applicable laws and shall not engage any employee below 18 years of age.
3. The subcontractor shall take special care of the employees affected with occupational diseases under rule 230 and schedule II of BOCW Rules. The employees not meeting the fitness requirement should not be engaged for such job.
4. Ensure that the regulatory requirements of excessive weight limit (to carry / lift / move weights beyond prescribed limits) for male and female workers are complied with.
5. System for Issue of Gate Passes to authorized personnel only shall be ensured at site
6. The subcontractor shall keep accurate and updated records of all manpower preferably in soft form
7. The subcontractor shall ensure appropriate infrastructure for workers as per Clause 8.4.

8.3 PROVISION OF PPEs

1. Adequate numbers of Personnel Protective Equipment (PPEs), will be made available at site & their effectiveness and regular use by all will be ensured
2. The PPEs shall conform to the relevant standards as listed in Annexure 01, and bear ISI mark.
3. The following matrix recommends usage of minimum PPEs against the respective job. For details, the respective OCPs to be referred.
4. The exact PPEs required for a particular task shall be chosen to ensure there are multiple lines of defense against accident or injury. All applicable safety precautions for a job shall be ensured notwithstanding the duration or perceived importance of the task.
5. Additionally, the BHEL safety officer may demand additional PPEs based on specific requirement
6. The applicability of PPEs shall be as per the concept of Hierarchy of controls, i.e.:
   Elimination->Substitution->EngineeringControls->AdministrativeControls-PPEs
7. Relying solely on PPEs without other applicable controls to be strictly avoided.
8. The issuing agency shall maintain register for issue and receipt of PPEs (Format No. HSEP: 13-F06). All the PPEs shall be checked for quality before issue and shall be periodically re-checked. The users shall be advised to check the PPEs themselves for any defect before putting on. The defective ones shall be replaced.
9. The body harnesses shall be serial numbered.
10. All worker should wear reflecting Jacket during both shift Day/Night.
11. Where workers are employed in sewers and manholes, which are in use, the subcontractor shall ensure that the manhole covers are opened and ventilated at least for an hour before the workers are allowed to get into manhole, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent incident to the public
12. Besides the PPEs mentioned above, the persons shall use helmet, safety shoe and reflective vest at all times. The visitors shall use Helmet and any other PPEs as deemed appropriate for the area of work.
13. Following color scheme for Helmets to be maintained:

a. Workmen: Yellow/ Orange
b. Safety staff: Green or white with green band
c. Electrician: Red
d. Others including visitors: White

14. The Helmets shall have logo or name (abbreviation of agency name permitted) affixed or printed on the front along with the person's gate pass no. & blood group. All the workers should be affixed with "Project" on their helmet. An awarded worker shall have reflective logo.

Sl. No	Type of work	Suggested PPEs
1	Work at height	Double lanyard full body harness having shock absorber (mandatory) with rope grab (as applicable), retractable Fall arrestor (specific cases), Safety nets (single / double)
2	Concrete and asphalt mixing	Nose mask, hand glove, apron, gum boot, goggles
3	Welders/ Grinders/ Gas cutters	Welding/face screen, apron, hand gloves, nose mask and ear muffs if noise level exceeds 90dB. Helmet fitted with welding shield is preferred for welders, safety goggles
4	Stone/ concrete breakers	Ear muffs, safety goggles, hand gloves
5	Electrical Work	Rubber hand glove, Electrical Resistance shoes, For LV electrical operations: LV arc-flash resistant suit/jacket
6	Insulation Work	Respiratory mask, Hand gloves, safety goggles
7	Grit/Sand blasting	Blast suit, blast helmet, respirator, leather gloves, safety goggles
8	Painting	Plastic gloves, Respirators (particularly for Spray painting)
9	Radiography	As per BARC guidelines
10	General	Helmets, Safety Shoes Reflective vests, ear plugs, nose masks, safety goggles

8.4 ARRANGEMENT OF INFRASTRUCTURE

The subcontractor is responsible for ensuring and maintaining the required HSE infrastructure at site as described in this Section

8.4.1 DRINKING WATER

1. Drinking Water Storage Tanks shall be provided and maintained at suitable places at different elevations / locations to ensure easy accessibility. The tank/container shall be kept on a platform at an elevation of at least 2 feet and should be covered:

2. **Construction and Quantity:** The design of Drinking Water Storage Tank (DWST) shall be submitted to BHEL for approval prior to initiating construction. Provision of 5-liter water daily for each worker to be maintained.
3. **Labelling:** DWST should be labeled as “Drinking Water”. Date of last cleaning, next due date shall be indicated on the container besides Date of source testing as per IS 10500.
4. Cleaning of the DWST shall be ensured at least once in a week. Mild cleaning detergents as used for cleaning vessels shall be applied and scrubbers (3M or equivalent) shall be used for removing scales and deposits on the inside surface. The tank shall be thoroughly cleaned with potable water only before it is refilled.
5. Suitability of the water source should be tested as per IS10500.
6. For all tanks containing water unsuitable for drinking, prominent “Do Not Drink” signage shall be pasted in English, Hindi and local language.
7. In Hot Work and other critical areas, drinking water shall be made available near the activity
8. Provision of supplying drinking water to height workers and those working in difficult to reach areas shall be made available through dedicated personnel.
9. **Cleaning & disinfecting the water tank (Procedure):** It is necessary to clean and disinfect the water holding tank on regular basis. This is to remove algae (plant growth which produces bad tastes and odours), silt, and bacteria which may be harmful.

A) <u>If the Water Holding Tank is Accessible:</u>

Precaution is to be taken when using a strong chlorine solution. A water holding tank is a confined space.

a) Empty the tank.
b) Scrub or pressure wash the interior walls to remove dirt and grime.
c) Rinse out the tank.
d) Mix a solution of household bleach and water (1 tablespoon or 15 ml of bleach for every gallon of water).
e) Scrub or pressure wash the interior walls of the tank with this solution, and leave it sit for 2 hours.
f) After 2 hours, thoroughly rinse the tank with clean water.
g) Refill with potable water.

B) <u>Not Accessible for Cleaning:</u>

a) Ensure the tank is full of water.
b) Add the required amount of household bleach (see table below to the water in holding tank.

If possible, mix the bleach and water.

c) To disinfect the plumbing lines and fixtures, turn the tap(s) on. Once you smell the chlorine odor at each outlet, close the tap.
d) Leave for 12 hours (generally done overnight).
e) Drain the water tank (but not into a septic tank).
f) Refill with potable water.

Dosage of Household Bleach (5% chlorine) required for the Cleaning and Disinfecting of Water Holding Tanks Not Accessible for Cleaning				
Tank Size		**Amount of Household Bleach to Obtain 50 ppm of Chlorine**		
Litres	**Imp. Gallons**	**mL**	**Imp. Ounces**	**Cups**
277	50	227 mL	8	1
455	100	511 mL	16	2
909	200	909 mL	32	4
1137	250	1136 mL (1.2 L)	40	5
2273	500	2273 mL (2.3 L)	80	10
4546	1000	4546 mL (4.5 L)	160	20
6819	1500	6818 mL (6.8 L)	240	30
9092	2000	9091 mL (9.1 L)	320	40
11365	2500	11340 mL (11.5 L)	400	50

8.4.2 PROVISION OF LATRINES AND URINALS AT SITE:

Ref: Inter-state Migrant Workmen (Regulation & Employment and Act, 1979) read with The Inter-State Migrant Workmen (Regulation of employment and conditions of service) central rules, 1980 (PI refer rule no. 42)

A) LATRINES

1. Latrines shall be provided in every establishment on the following scale, namely: -
    a. Where females are employed, there shall be at least one latrine for every 25 females;
    b. Where males are employed, there shall be at least one latrine for every 25 males:

   Provided that where the number of males or females exceeds 190, it shall be sufficient if there is one latrine for 25 males or females, as the case may be, up to the first 100, and one for every 30 thereafter
2. Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.
3. Where workers of both sexes are employed there shall be displayed outside each block of latrine and urinal a notice in the language understood by the majority of the workers **'For Men Only'**, or **For Women Ónly**', as the case may be.
4. The notice shall also bear the figure of a man or of a woman, as the case may be.

B) URINALS

1. There shall be at least one urinal for male workers up to fifty and one for female up to fifty employed at a time:

2. Provided that where the number of male or female workmen, as the case may be, exceeds 500 it shall be sufficient if there is one urinal for every fifty females up to the first 500 and one for every 100 or part thereof thereafter.
3. The urinals shall be designed and located so as to ensure privacy.
4. In case a structure encompasses multiple floors, urinals shall be provided suitably for quick access
5. The latrines and urinals shall be conveniently situated and accessible to workers at all times at the establishment.
6. The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.
7. Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the public health authorities.
8. Water shall be provided by the means of tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.

8.4.3 WASHING FACILITIES

1. In every workplace, adequate and suitable facilities for washing shall be provided and maintained.
2. Separate and adequate cleaning facilities shall be provided for the use of male and female workers. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition and dully illuminated for night use.
3. Overalls shall be supplied by the subcontractor to the workmen and adequate facilities shall be provided to enable the painters and other workers to wash during the cessation of work.

8.4.4 PROVISION OF REST SHELTER FOR WOKERS

Proper Sheds & Shelters big enough to accommodate all possible workers shall be provided for workers to rest during break. Taking rest at height, in activity area and other hazardous locations shall not be allowed.

The drawing of such sheds shall be submitted to BHEL for approval before construction.

8.4.5 MEDICAL FACILITIES

Refer Section B for applicability of requirements pertaining to Clause 8.4.5.1

8.4.5.1 MEDICAL CUM FIRST-AID CENTER

a) A medical center shall be setup at site with basic facilities for handling medical emergencies. The medical center shall be developed independently by BHEL/an agency as specified in the contract and run jointly by all agencies on proportionate sharing basis as stipulated in the contract. Cost sharing for development of medical center will be as per special requirements (Section-B) of this HSE plan.
b) A qualified medical professional, not less than MBBS, shall be deployed at medical center as stipulated in the contract. (Part-time or full time as decided at the site).
c) There shall be a full-time trained first aider and a nurse. Depending upon the working hours at the site, First-aider shall be deployed accordingly.
d) The center shall have all articles as per Schedule IV of BOCW (Central) Rules'1998. In addition, one Stokes basket stretcher shall be available.

e) An ambulance shall be deployed for every 1000 persons along with trained driver and accessories as per schedule V of Central BOCW Rules'1998. Depending upon the working hours at the site, First-aider shall be deployed accordingly.

f) The center shall be adequately equipped for Resuscitation, Immobilization, Dressing, dealing with poisoning cases including snake and insect-bites and sufficient stock of emergency medicines as prescribed by the qualified medical professional as per point (b)

8.4.5.2 IMPORTANT

a) If there is no specific mention of responsibility of deployment or setting up of any of the above facilities and operating expenses thereof, BHEL site management shall have the liberty to give this responsibility to any of the contractors on cost sharing basis.

b) Medical waste shall be disposed as per prevailing legislation (Bio-Medical Waste – Management and Handling Rules, 1998)

c) Every injury shall be treated, recorded and reported.

d) All First Aid injuries shall be recorded as per Format No. HSEP:13-F17

e) List of qualified first aiders and their contact numbers to be displayed at conspicuous places.

8.4.5.3 FIRST AID

A. In addition to 8.4.5.1 &2, the subcontractor with Boiler& ESP, TG and Civil shall:

1. Provide necessary first aid facilities for every work place.
2. Ensure availability of qualified First-aider throughout the working hours.
3. Every injury shall be treated, recorded and reported.
4. Refresher course on first aid shall be conducted as necessary.
5. List of qualified first aiders and their contact numbers to be displayed at conspicuous places.
6. All First Aid injuries shall be recorded as per Format No. HSEP:13-F17

B. FIRST AID BOX

1. The first aid box shall be maintained by first aider who shall always be readily available during the working hours of the work place.
2. **Details of First Aid Box:**
   a) Details of contents of first aid box is given in **Annexure 02**
   b) A slip of contents shall be pasted on the First Aid Box with following details: **Name, Quantity, Expiry Date, Checked by…**
   c) First Aider's name and contact no to be displayed on the box.
   d) The first aid box shall be distinctly marked with a Green Cross on white background.
   e) The box shall be properly secured with lock & key to avoid misuse
3. The first aid boxes should be placed at various locations so as to make them available within easy reach of hazardous activities and at the quickest possible time.
4. The subcontractor shall ensure that the Supervisors and Engineers are adequately trained for attending to any emergency.
5. Monthly inspection of First Aid Box to be conducted by the subcontractor as per Format no. HSEP:13-F01

8.4.5.4 HEALTH CHECK UP

The persons engaged at the site shall undergo health checkup as per the **Format no. HSEP: 13-F02** before induction. The persons engaged in the following works shall additionally undergo regular health checkup using same Format at least once in a year:

Height workers	Drivers/crane operators/riggers	Confined space workers
Shot/sand blaster	Welding and NDE personnel	Any person referred by BHEL

8.4.5.4.1 HEIGHT PHOBIA TEST

1. The persons engaged in working at heights (above 2 meters) to be assessed for Height Phobia and associated conditions.
2. Such workers are to be allowed only on successful completion of this test, otherwise they shall be allocated ground-based jobs. IDs / Height passes shall be issued to such workers.

8.4.6 PROVISION OF CANTEEN FACILITY

Minimum or better facilities to be ensured as per BOCW (Rule 244) / Factories Act, specially taking care of the following:

1. Canteen facilities shall be provided for the workmen of the subcontractor inside the project site.
2. Proper cleaning and hygienic condition shall be maintained.
3. Proper care should be taken to prevent biological contamination.
4. Adequate drinking water should be available at canteen.
5. Fire extinguisher shall be provided inside canteen.
6. Regular health check-up and medication to the canteen workers shall be ensured.
7. Canteen waste to be disposed of in compliance with law
8. Domestic LPG cylinder shall not be used
9. Canteen should be periodically inspected using standard checklist finalized along with BHEL

8.4.7 PROVISION OF ACCOMMODATION / LABOR COLONY

1. The subcontractor shall provide to every workman (within fifteen days of the commencement of the employment of migrant workmen):

a) In case he is accompanied by any other member of his family, a suitable barrack so as to accommodate one room having at least a floor area of 10 square meters, a verandah and adequate additional covered space for cooking food as well as one common sanitary latrine, one common bathroom for every three such quarters; and

b) In case he is unaccompanied by any other member of his family, a suitable barrack so as to accommodate not more than ten such migrant workmen, having at least a floor area of not less than 6.5 square meters for each such migrant workman making use of the barrack, a verandah and adequate additional covered space for cooking food as well as one common sanitary latrine and one common bathroom for every ten such migrant workmen

2. Every quarter and the barrack shall be so constructed as to afford adequate ventilation, protection against heat, wind, rain and shall have smooth, hard and impervious floor surface.

3. The quarters or the barracks, as the case may be, shall be at a convenient distance from the establishment and shall have adequate supply of wholesome drinking water.
4. The area in which the quarters and/or barracks are located as well as the latrines and bathrooms provided therein shall be kept in a clean and sanitary condition at all times.
5. Regular housekeeping of the labor colony shall be ensured.
6. Availability of Bathing/ washing bay to be ensured
7. Room ventilation and safe electrification to be ensured
8. MSDS of LPG shall be put up prominently and shall be included in the induction training also.
9. The labor colony shall be secure so that only authorized persons have access to it.
10. Availability of local market to be ensured by the Sub-contractor
11. A “Suggestion Register” shall be made available at the labor colony for workers. The feedback shall be reviewed on weekly basis and acted upon.
12. Labor colony shall be inspected fortnightly by Subcontractor Safety Officer & HR executive, and report submitted to BHEL as per Format No. HSEP:13-F16
13. **Facility of Crèches –** to be provided wherein more than fifty female workers are deployed
14. Provisions of Clause 8.4.1, 8.4.2 and 8.4.3 shall be applicable on labor colony as well
15. First aid facility shall be provided in the labour camp under the administration of trained first aiders.
16. Common kitchen facilities to be ensured and cooking inside the room to be avoided. The kitchen should be maintained in hygienic condition.
17. Awareness training shall be organized for the workers regarding fire safety, safe use of LPG, Health & Hygiene, and electrical safety etc. on monthly basis.
18. Perimeter fencing, security and main gate entrance shall be established and maintained.
19. Adequate drainage and approach roads to be done.

8.4.8 PROVISION OF EMERGENCY VEHICLE

Dedicated emergency vehicle shall be made available at workplace by subcontractor for evacuation of victim from site.

However, Ambulance shall be used exclusively for transporting victim to hospital

8.4.9 PEST CONTROL

Regular pest control should be carried out at all offices, mainly laboratories, canteen, labor colony and stores by the subcontractor.

8.4.10 SCRAPYARD

1. Scrapyard shall be developed by subcontractor to store metal scrap, wooden scrap, waste, hazardous waste.
2. Scrap/Waste shall be segregated as Bio-degradable and non-bio-degradable and stored separately.

8.4.11 ILLUMINATION

The subcontractor shall provide adequate lighting facilities e.g. flood lighting, hand lamps, area lights etc. to ensure adequate lighting at all work places & their approaches including passage ways as per IS: 3646 (Part-II) at all times. Indicative recommended values are given below:

S. No.	Location	Lux Level
A.	**Construction Site**	
1	Outdoor areas like store yards, entrance and exit roads	**20**
2	Platforms	**50**
3	Entrances, corridors and stairs	**100**
4	General illumination of work area	**150**
5	Rough work like fabrication, assembly of major items	**150**
6	Medium work like assembly of small machined parts	**300**
7	Fine work like precision assembly, precision measurements etc.	**700**
8	Sheet metal works	**200**
9	Electrical and instrument labs	**450**
B.	**Office**	
1	Outdoor area like entrance and exit roads	**20**
2	Entrance halls	**150**
3	Corridors and lift cars	**70**
4	Lift landing	**150**
5	Stairs	**100**
6	Office rooms, conference rooms, library reading tables	**300**
7	Drawing table	**450**
8	Manual telephone exchange	**200**

In case any area is not mentioned above, the applicable illumination for the same shall be specified by BHEL based on applicable standards and international norms

1. Level of illumination shall be checked periodically using a calibrated lux meter and recorded for each work area on minimum weekly basis.
2. Lamp (hand held) shall not be powered by mains supply but either by 24V or dry cells.
3. Lamps shall be protected by suitable guards where necessary to prevent danger, in case of breakage of lamp.
4. Emergency lighting provision for night work shall be made to minimize danger in case of main supply failure.

9. HSE TRAINING & AWARENESS

9.1 HSE INDUCTION TRAINING

1. All persons entering into project site shall be given HSE induction training before being assigned to work, which shall be imparted through audio-visual medium and shall be of minimum 2-hour duration.
2. Any single trainee batch size should not exceed 40.
3. Proper safety wear & gear must be issued to all the workers being registered for the induction (i.e., Shoes/Helmets/Goggles/Leg guard/Apron etc.)
    i. They must arrive fully dressed in safety wear & gear to attend the induction.

ii. Any one failing to conform to this safety wear& gear requirement shall not qualify to attend.

4. In-house induction training subjects shall include but not limited to:
   i. Briefing of the Project details and importance of employee for the project and for the nation.
   ii. Safety related cardinal rules, objectives and targets.
   iii. Site HSE rules.
   iv. Site HSE hazards and aspects.
   v. First aid facility.
   vi. Emergency Contact No. and procedures
   vii. Details of Fire prevention and emergency response systems & procedures at site.
   viii. Requirement of incident / near miss reporting by all.
   ix. Accident case studies
   x. Rules to be followed in the labor colony (if applicable)
5. Evaluation to be carried out after training and induction training to be repeated in case of failure of participant in evaluation
6. On completing subcontractor's in-house HSE induction, each employee shall sign an induction training form (format no. HSEP: 13-F03) to declare that he had understood the content and shall abide to follow and comply with safe work practices. They may only then be qualified to be issued with a personal I.D. card, for access to the work site (provided Health Checkup is over).

9.2 HSE TOOLBOX TALK

1. HSE Tool Box talk shall be conducted by frontline foreman/supervisor of subcontractor to specific work groups daily prior to the start of work. The agenda shall consist of the following:
   i. Visual checkup of workers regarding health, any signs of fatigue, intoxication etc.
   ii. Details of the job being intended for immediate execution.
   iii. The relevant hazards and risks involved in executing the job and their control measures.
   iv. Specific site condition to be considered while executing the job like high temperature, humidity, unfavorable weather etc.
   v. Recent non-compliances observed.
   vi. Appreciation of good work and warning for any unsafe acts done by any person.
   vii. Any doubt clearing session at the end
2. Record of Tool box talk shall be maintained as per Format no. HSEP:13-F04

9.3 TRAINING ON HEIGHT WORK

Due to the large percentage of fall from height in incidents, training of minimum 2-hour duration on height work shall be imparted to all height workers by in- house / external faculty for every batch of new inductees. The training shall include following topics:

1. Inspection of work area, access and egress w.r.t height hazards
2. Use of PPEs; use of fall arrester, retractable fall arrester, life line, safety nets etc.
3. Safe climbing through monkey ladders.
4. Inspection of PPEs.
5. Medical fitness requirements.
6. Mock drill on rescue at height.

7. Dos & Don'ts during height work.
8. Accident case studies

In case, above is organized by BHEL, proportionate cost shall be borne by subcontractors

9.4 HSE TRAINING DURING PROJECT EXECUTION

1. HSE training shall be arranged by subcontractor as per the need of the project execution and recommendation of BHEL.
2. The topics of the HSE training shall be as follows but not limited to:
   i. Hazards identification and risk analysis & Identification of Environmental Aspects / Impacts
   ii. Work Permit System
   iii. Learning from past incidents
   iv. First aid, Firefighting & Fire-warden training
   v. EMS and OHSMS
   vi. T & Ps fitness and operation
   vii. Electrical & Chemical safety
   viii. Welding, NDE & Radiological safety
   ix. Material handling.
3. Safety awareness and on-the-job training programmes shall be carried out at site for all workers periodically. Periodicity to be decided by BHEL but shall be minimum once in six months
4. Penalty Training – In case of any incident, the involved person, group or agency shall undergo a penalty HSE training for a minimum period of 2 hrs. or as decided by BHEL.
5. In case it is not possible to provide training to all workers at once, same shall be imparted in Batch-wise manner so as to cover all workers with specified periodicity.
6. An up-to-date record to be maintained with attendance of participants and trainers preferably in soft copy as per Format No. HSEP: 13-F03.
7. Every employee of agency should be provided at least 2 hr. safety training in every month. In case, above is organized by BHEL, proportionate cost shall be borne by subcontractors

10. HSE PROMOTION: SIGNAGE, POSTERS, COMPETITION, AWARDS ETC

10.1 DISPLAY OF HSE POSTERS AND BANNERS

Site shall arrange appropriate posters, banners, slogans in local/Hindi/English languages at work place.

10.2 DISPLAY OF HSE SIGNAGE

Appropriate HSE signage shall be displayed at the work area to enhance awareness of HSE workmen and passersby about the work going on and do's and don'ts to be followed.

10.3 COMPETITIONS ON HSE, AWARDS & REWARDS

1. Subcontractor shall arrange competitions (slogan, poster, essay etc.) on HSE for workers and employees from time to time (Safety day, World Environment Day etc. minimum one such function each month) and winners will be suitably awarded during the functions.

2. Subcontractor shall identify workers following good HSE practices and reward them from time to time as encouragement to follow good HSE practices.
3. Alternatively, if a common monthly function is organized at site, subcontractor shall participate in the same so that a minimum frequency of one such function per month is maintained.

10.4 HSE AWARENESS PROGRAMMES

Subcontractor shall arrange HSE awareness programmes periodically on different topics including medical awareness for all personnel working at site from time to time including officials involved in execution.

11. HSE COMMUNICATION AND PARTICIPATION

11.1 MONTHLY HSE REPORTING

1. HSE activities shall be reported to BHEL monthly as per Format no. HSEP: 13-F05. The reporting medium can be hard/soft as per BHEL requirement.
2. The period of reporting shall be 25th of the preceding month to 24th of the present month and report shall be submitted by the end of the calendar month or as conveyed by BHEL.
3. BHEL can modify the reporting requirements as per requirement

11.2 HSE EVENT REPORTING

1. Important HSE events like HSE Training, Mock / Fire/Rescue Drills, Medical camp etc. organized by subcontractor shall be reported to BHEL in detail with photographs
2. Celebration of important days like National Safety Day, World Environment Day etc. shall also be reported likewise.

11.3 HSE INCIDENT REPORTING

All incidents (near misses, property damage, first-aid cases, minor, major and fatal incidents) shall be reported to BHEL as they happen through SMS and Hard/Soft copy as per Format No. HSEP: 08-F01 & F02.

11.4 HSE SUGGESTIONS

All workers and employees to be encouraged to provide suggestions for improvement in Health, Safety & Environment at site. The suggestions to be recorded in a “Suggestions Register”. Suggestions to be reviewed and those having potential of significant beneficial effects are to be implemented, and recognition / award to be given to the individual.

11.5 CLIENT COMMUNICATON

All HSE related communication from BHEL, customer / external statutory and regulatory agencies to be handled on priority. The relevant issues to be resolved in expeditious manner

11.6 RECORDS OF COMMUNICATON

Records of all communication and their responses as detailed above shall be maintained by subcontractor in hard / soft copy and produced when required.

12. INCIDENT REPORTING, INVESTIGATION & CORRECTIVE ACTION

1. A conducive environment for reporting of near misses and other incidents shall be developed at site through system of rewards etc.
2. Priority to be given to ensure medical treatment of the victim. Victim to be given immediate First Aid and transported to Medical Facility in a well-equipped Ambulance
3. All incidents, as they happen, shall be reported to BHEL immediately over phone/SMS/WhatsApp/mail and then in Format No. HSEP:08-F01 & F02 within 24 hrs. of occurrence. Immediate SMS shall be sent to concerned Package In-charge with following Details:
    a. Project & Customer Name:
    b. Subcontractor Name & Scope:
    c. Incident Area:
    d. Number of Injured / Fatalities:
    e. Date & Time of Accident:
    f. Incident Description in few lines:

    No incident shall be hidden
4. Records of all incidents shall be maintained in hard / soft copy.
5. For all incidents:
    a. The incident area, equipment / tools involved, documents & records etc. shall be maintained as-it-is pending investigation
    b. Root Cause Analysis (RCA) to be conducted and corresponding Corrective / Preventive Action (CAPA) ensured
    c. Responsibility shall be assigned and action to be taken against the erring individual
    d. In case presence of manufacturer of the equipment involved is required, subcontractor will arrange the same
    e. All expenses pertaining to the RCA / CAPA shall be borne by the subcontractor
6. RCA and CAPA reports of all near misses and minor injuries shall be identified and report submitted to BHEL within 7 days of occurrence.
7. For incidents, where worker does not resume duty within 48 hours of occurrence, Joint investigation along with BHEL shall be conducted within 7 days, and CAPA ensured.
8. Corrective action shall be immediately implemented at the work place. Work shall be put on hold in the area till corrective actions are verified by BHEL
9. All incidents, their Root Cause Analyses and Corrective actions shall be recorded, and analyzed so as to identify weak areas and actions to be taken to reduce the incident trend.

13. SAFETY DURING WORK EXECUTION

13.1 HSE SYSTEMS AND PROCEDURES

BHEL Power Sector HSE Management System (HSEMS) shall be referred for controlling hazards, aspects, and carrying out HSE activities at site. Subcontractor shall get familiar with and follow the

HSEMS documents provided by BHEL which include the follows:

13.1.1 HSE PROCEDURES:

HSE activities shall be conducted at site based on the HSEMS developed by BHEL Power Sector and issued to site by PSER-HQ. While planning for any activity the following documents shall be referred for infrastructural requirements to establish control measures:

HSEP01: HSE Procedure for Register of OHS Hazards and Risks
HSEP02: HSE Procedure for Register of Environmental Aspects and Impacts
HSEP03: HSE Procedure for Register of Regulations
HSEP04: HSE Procedure for Training and Awareness
HSEP05: Operational Control Procedures
HSEP06: HSE Procedure for Emergency Preparedness and Response Plan
HSEP07: HSE Procedure for performance measurement, monitoring and review
HSEP08: HSE Procedure for Incident Investigation, reporting& corrective action
HSEP09: HSE Procedure for Non-Conformity Handling &Corrective Actions
HSEP10: HSE Procedures for Control of Records
HSEP11: HSE Procedure for Contract documents
HSEP12: HSE Procedure for Permit to Work
HSEP15: HSE Procedure for Operational Control

13.1.2 PERMIT TO WORK (PTW) SYSTEM

1. The following activities shall be carried out by the subcontractor strictly after obtaining Permit to Work (PTW) from BHEL
    i. General Work Permit (**Format No. HSEP14-FP01)**
    ii. Height working (**Format No. HSEP14-FP02)**
    iii. Hot working (**Format No. HSEP14-FP03)**
    iv. Confined space Work (**Format No. HSEP14-FP04)**
    v. Excavation more than 2-meter depth (**Format No. HSEP14-FP05)**
    vi. Radiography / Radiation Work (**Format No. HSEP14-FP06)**
    vii. Heavy / Complex / Critical Lifting Activity (**Format No. HSEP14-FP07)**
    viii. Night / Holiday Work (**Format No. HSEP14-FP08)**
    ix. Material Loading / Unloading Permit (**Format No. HSEP14-FP09)**
    x. Grating / Safety Net / Safety Facility Removal Permit (**Format No. HSEP14-FP10)**
    xi. Live Electrical Maintenance etc. - Lockout / Tag (**Format No. HSEP14-FP11)**
    xii. Beam/ Truss/ Duct/ Structure Alignment Permit **(Format No. HSEP14-FP12)**
2. The above list is not exhaustive. BHEL reserves right to introduce additional Permits or modify requirements for usage of existing Permits. The conditions for using the Permit are specified in the Format (General Requirements).
3. Where customer is having separate Work Permit System the same shall be followed in conjunction to ensure all activities and checks are covered in all systems.
4. Permit applicant shall apply for work permit of particular work activity at particular location before starting of the work along with Job Hazard Analysis.

5. All Permit signatories shall physically visit the work area and check that all the safety control measures necessary for the activity are in place. Only then the permit shall be issued.
    a. Signatory shall physically visit the area of work and ensure all required safeguards before signing the Permit
    b. Signatory shall periodically visit the area to confirm the availability of required safeguards throughout the currency of the permit
    c. In case any Permit requirement is not available, work will be stopped till it is made available
6. Permit holder shall implement and maintain all control measures during the period of permit. The permit will be closed after completion of the work and submitted to BHEL.

13.1.3 OPERATIONAL CONTROL PROCEDURES

1. All applicable OCPs (Operational Control Procedures) as identified from outcomes of HIRA, Aspect / Impact studies and BHEL inputs will be followed by subcontractor. This will be done as part of normal scope of work.
2. Illustrative list of such OCPs is given in Table 13.1 and same will be made available to subcontractor by BHEL during work execution at site.
3. In case any other OCPs are required or existing ones need to be modified in order to control the risks / impacts associated with any activity during the execution of work subcontractor shall prepare / update and follow the same with information to BHEL.

Table 13.1 - LIST of Reference OCPs

No.	Topic	No.	Topic	No.	Topic
0	General Safety	22	Steam blowing	44	Material preservation
1	Handling of chemicals	23	Working in confined area	45	Electro-resistance heating
2	Electrical safety	24	Operation of passenger lift, material hoists & cages	46	Blasting
3	Energy conservation	25	Vehicle/ Crane maintenance	47	Transformer charging
4	Welding and gas cutting operation	26	Radiography	48	Handling of battery system
5	Fire safety	27	Waste disposal	49	DG set
6	Use of hand tools	28	Handling & storage of mineral wool	50	Sanitary maintenance
7	First aid	29	Working at night	51	Piling rig operation
8	Food safety at canteen	30	Computer operation	52	Passivation
9	Use of cranes	31	Storage in open yard	53	EDTA Cleaning
10	Storage and handling of gas cylinders	32	Drilling, reaming and grinding(machining)	54	Chemical cleaning of Pre boiler system
11	Manual arc welding	33	Stress relieving	55	Boiler Light up

12	Use of helmets	**34**	Hydraulic test	**56**	Rolling and Synchronization
13	Good house keeping	**35**	Trial run of rotary equipment	**57**	Loading of Unit
14	Safe excavation	**36**	Batching	**58**	Air compressor
15	Working at height	**37**	Cable laying/tray work	**59**	Hydra Operation
16	Filling of hydrogen in cylinder	**38**	Spray insulation	**60**	Duct Pre-assembly
17	Illumination	**39**	Compressor operation	**61**	Resumption of construction activities after lockdown and prevention of coronavirus infection during site operations
18	Handling and erection of heavy metals	**40**	Gas distribution test		
19	Acid cleaning	**41**	Cleaning of Hot well / Deaerator		
20	Oil flushing	**42**	Electrical maintenance	**61A**	Prevention of Covid-19 infection in labour colony
21	Alkali boil out	**43**	O&M of control of AC plant & system	**62**	Truss/ Structure fit-up and alignment

13.2 ACTIVITY SPECIFIC REQUIREMENTS FOR SAFETY:

All Work shall be commenced only after taking the respective Work Permits (as applicable) and precautions as per relevant codes, systems and OCPs in order to ensure safe conditions throughout the duration of work. Additionally, activity specific safeguards as per this section shall be followed.

13.2.1 WORK AT HEIGHT:

1. All work at height above 2 meter above ground level without complete platforms, handrails and other related fall protection shall require a work permit in the prescribed form. This shall require approval by the competent authority. The HSE officer of sub-contractors shall follow the checklist religiously by physically verifying the condition of the work area before recommending for approval.
2. Prior to the start of work at elevation, the HSE Officer involved with the work must meet the work supervisor to review the scope of work, and must review all the possible fall hazards and effective safety responses. The evaluation / analysis must be documented and kept on file and on site by the HSE Officer.
3. Whenever a fall hazard or other exposure exists for working at heights more than 2.0m/6ft, the nature and scope of work will be evaluated for conditions and environmental factors before selecting the appropriate fall protection system (active, passive or a combination of measures, as appropriate).
4. All Engineering and Administrative Controls including barricading, safe platform, Safety Nets etc. shall

be made available at work location. Under no circumstances, there shall be total reliance on PPEs only

5. **Safety Nets**
   a. Contractor shall maintain sufficient stock of Safety Nets for deployment
   b. Safety Nets as per IS: 11057:1984 should be used extensively for prevention / arrest men and materials falling from height.
   c. The safety nets shall be fire resistant, duly tested and shall be of ISI marked.
   d. Safety Nets shall be deployed below all platforms where height work is envisaged. Duration of work, delay shall be no excuses for non-installation of Safety Net
6. Reaching beyond barricaded area without lifeline support, moving with support of bracings, walking on beams without support, jumping from one level to another, throwing objects and taking shortcut must be discouraged.
7. Monkey Ladder shall be fitted with cages. Rope ladder should be discouraged.
8. In case of pipe-rack, persons should not walk on pipes and walk on platforms only.
9. In case of roof work, walking ladder/ platform should be provided along with lifeline and/ or fall arrestor.
10. For chimney or structure painting, both hanging platform and men should be anchored separately to a firm structure along with separate fall arrestor.
11. The procedures for the safety response to identified fall hazards developed and rescue plans must be reviewed with all individuals exposed to the hazards.
12. The HSE Officer must establish an inspection process of fall protection systems. Some equipment requires documented inspections by its manufacture on a regular schedule. Such equipment must have evidence of the inspection and re-certification process on it. This information must be reviewed before the equipment is actually used. Individuals must visually inspect the fall protection equipment before each use. Failure to complete this inspection process could result in serious injury or death.
13. Immediately remove from service any fall protection equipment that is identified as defective, damaged, or has been subjected to an impact. Damaged fall protective equipment must be destroyed to prevent re-use and not be discarded into trash containers, as the worn or damaged equipment could be unintentionally re-used.
14. Aerial lifting devices, excluding scissor lifts require the use of full body harnesses and lanyards in any elevated position.

13.2.1.1 Personnel fall protection system must include:

a. Safety Harness

All height workers must use Full Body Safety harness with double lanyards with shock absorber (only). The primary lanyard is never unhooked until the secondary lanyard is secure. The design of the working platform should be such that under no circumstances, worker should have both lanyards unhooked while at height.

b. Lanyard

i. The type of work and the environment conditions determine lanyard and lifeline selection. If welding, chemical cleaning that may damage lanyards, connectors or lifelines, sandblasting, etc., either protect the components or use more appropriate type of system.

ii. Lanyards and lifelines must incorporate, or be used with, an appropriate deceleration (shock

absorbing) device. Deceleration devices include rope grabs, rip-stitch lanyards, specially woven lanyards, tearing, or deforming lanyards, automatic self-retracting lifelines and lanyards which dissipate or limit the energy imposed on the employee during fall arrest.

iii. Once in use, the system's effectiveness is to be monitored. In some cases, a program for cleaning and maintaining the system may be necessary. Lanyard and lifelines must use locking snap hooks only and under no circumstances must two lanyard snap hooks be connected.

c. Lifeline

All lifelines in general are to be made of min 12mm dia. steel rope (plastic coated) and tied to columns with 3 clamps at each end. Wherever columns are not available to tie the lifelines, the vertical posts as per the design below are to be provided after carrying out drop load test initially. A load of 240kg to be dropped off the mid-point of lifeline in this test.

d. Lifeline Post

DIAGRAM : LIFELINE POST

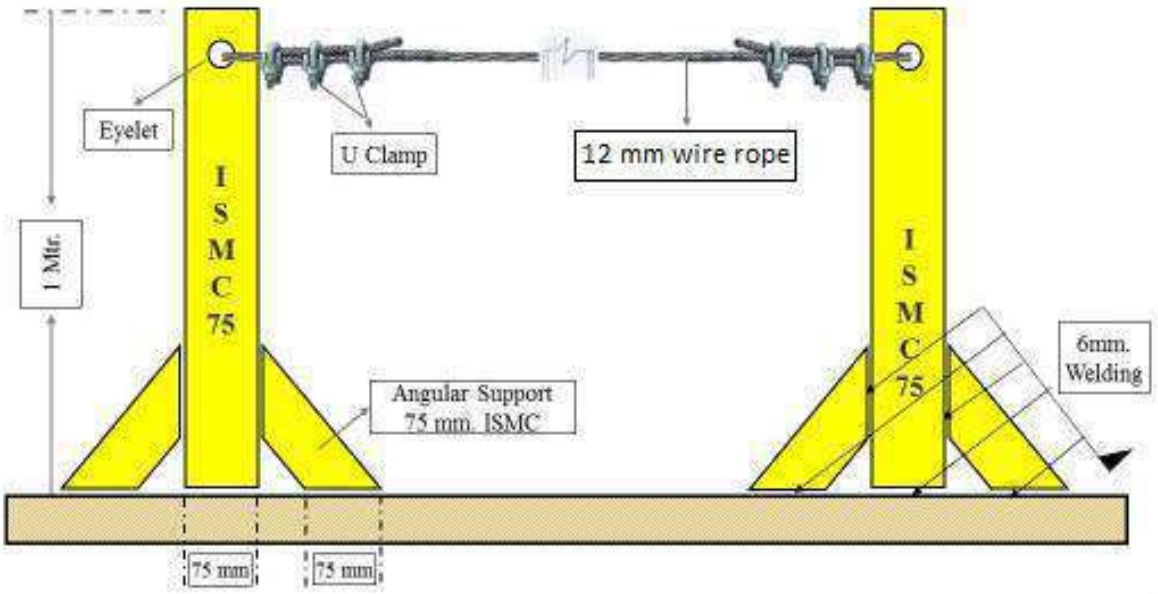


Fig. 13.2.1.1 Lifeline Post

i. The support at vertical post shall be fixed at end-to-end. The maximum length of one end to another end shall be 6 meters

ii. If the length of a lifeline is more than 6 meters, then intermediate vertical post(s) are to be used. Such intermediate post(s) will act as supports and the lifeline rope should simply pass through the eyelets (holes) of such supports without being anchored

iii. The lifeline need not be wrapped / clamped to any intermediate post

iv. Such intermediate posts must be used at an interval of every 6 meters

v. The post(s) in which the original lifeline is to be installed should be capable of sustaining a tensile stress of 2268 Kgs.

vi. In a horizontal lifeline installation, maximum allowable sagging is 500-600 mm

vii. For a single spun lifeline, no more than 2 persons are allowed to work; for more than two workers, another lifeline should be installed

viii. Horizontal lifeline should be so installed that it does not impede safe movement of workers

ix. All the installation work must be carried out by competent person with adequate knowledge

13.2.1.2 Working Platform

1. Working platforms, gangways and stairways shall be so constructed that they do not sag unduly or unequally and if the height of the platform gangways provided is more than 3.6 m above ground level or floor level, they shall be closely boarded and shall have adequate width, which shall not be less than 750 mm and be suitably fenced.
2. Precautions against the fall of Materials, Persons and Collapse of Structures:

i. Every opening in the floor or a building or in a working platform shall be suitably barricaded to prevent the fall of persons by providing suitable fencing or railing whose minimum height shall be 90 cm.

ii. Adequate precautions should be taken such as the provision of fencing, or barriers to protect any person who might be injured by the fall of materials, or tools or equipment being raised or lowered. Hard barricading shall be made at such places made of scaffolding pipe & clamps covered with reflective net. Cradle may be used for lifting materials - however this shall be made of MS angles and flats only and duly certified by the HSE officer. Operators may also use designed containers for lifting small tools.

iii. Guardrails (including scaffolding) erected over/adjacent working areas must have the guardrails screened (opening < 0.5), to prevent material from falling outside the platform/decking.

iv. Guardrails must be able to withstand a 200-pound force exerted in any one direction.

v. Where necessary to prevent danger, guys, stays or supports should be used or other effective precautions should be taken to prevent the collapse of structures or parts of structures that are being erected, maintained, repaired, dismantled or demolished.

vi. All openings through which workers are liable to fall should be kept effectively covered or fenced and indicated in the most appropriate manner.

vii. Guardrails and toe-board/barricades and sound platform conforming to IS: 4912-1978 and other Indian laws and regulations as depicted below should be provided.

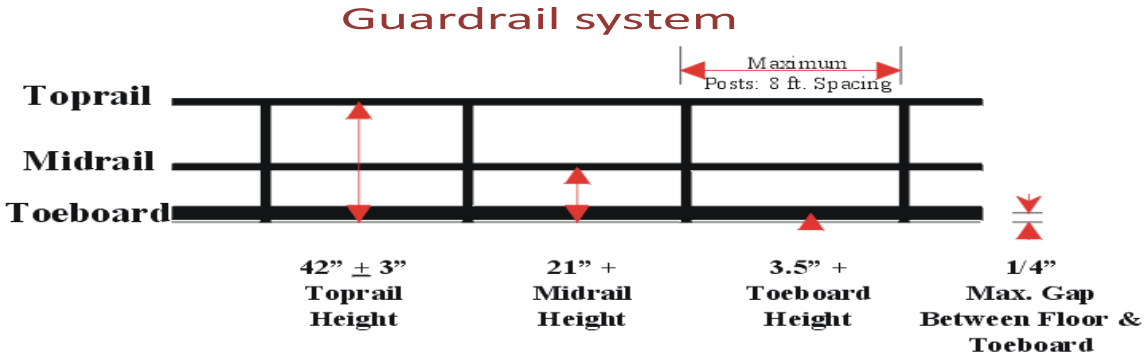


Fig. 13.2.1.2 Guard Rail System

viii. Guardrails shall be provided to protect workers from falling from elevated work places. The rails are generally made of MS pipes of suitable dia. Rebar shall not be used for any handrails, ladder or cover purpose. Wherever the guard-rails and toe-boards cannot be provided:

a. adequate safety nets or safety sheets shall be erected and maintained; or
b. adequate safety harnesses shall be provided and used and / or
c. adequate fall arrestor shall be provided and used.

As mentioned under PPE clause, all these PPEs shall be defect free and regularly inspected for any defect. The full body safety harness shall have double lanyard only with max 1.8m length.

ix. The monkey ladders shall have sufficient fall arrestors. Adequate lifelines of 8mm steel wire rope shall be provided across the work area.

x. The HSE officer shall recommend appropriate PPEs after analyzing hazards and risks involved.

13.2.1.3 Scaffolding

All scaffolds shall be conformant to the relevant standards including IS 3696 and IS 4014 as applicable. A sketch of the scaffolds proposed to be used shall be prepared and approval of the BHEL Engineer obtained prior to construction / use. Only cup lock type scaffoldings will be allowed in site. Where cup lock type scaffolding arrangement is not feasible by the virtue of the location, in that case only pipe and clamp type scaffolding will be allowed.

General

1. The scaffolding work must be carried out by a competent person, who shall train the scaffold users on safety aspects
2. All scaffolds shall be erected / dismantled by scaffolding crew under direct supervision of competent scaffolding supervisors.
3. All scaffolds shall be capable of supporting 4 times maximum intended load and erected on sound, rigid footing, capable of carrying the maximum intended load without settling or displacement. Bamboo scaffolding is not permitted for use on site.
4. Each employee on the scaffold shall use an approved safety harness attached to an independent lifeline. The lifeline is to be securely attached to substantial members of the structure (not the scaffold itself) or to securely rigged lines, which shall safely suspend a worker in event of a fall.
5. Guard rails and toe boards shall be installed on all open sides and ends of platforms more than (2) meters above ground or floor
6. Scaffold planks must be at least 5 cm x 25 cm (2” x 10”) full thickness lumber scaffold grade or better.
7. Scaffold planks shall not span distances greater than 2.5 meters (8 feet).
8. Scaffold planks shall extend over end supports not less than 6 inches nor more than 12 inches and be secured to the scaffold. Scaffolding and accessories with defective parts shall be immediately repaired or replaced.
9. All scaffolding must be a minimum of two planks wide. No one may work from a single plank.
10. Scaffold planks must be inspected before use. Planks that have been damaged must be removed from the site.
11. Access ladders must be provided for each scaffold. Climbing the end frames is prohibited unless the design incorporates an approved ladder.
12. Adequate mudsills or other rigid footing capable of withstanding the maximum intended load must be provided.
13. Scaffolds more the 6 meters (20 feet) in height must be tied to the building or structure at intervals which do not exceed 4 meters (13 feet) vertically and 6 meters (20 feet) horizontally.

14. Do not overload scaffolds. Material should be brought up as needed. Scaffolding must not be loaded in excess of its rated capacity.
15. Barrels, boxes, kegs, blocks or similar unstable object must never be used as work platforms or to support scaffold.
16. Where persons must work under or pass under a scaffold then a 18 gauge wire mesh screen must be installed between the toe board and guard rail.
17. Employees exposed to overhead hazards while working on a scaffold will be protected by 5 cm (2") thick planks.
18. Wooden/bamboo ladders shall not be allowed at any cost. Ladder's rungs shall be fitted /welded properly. Before every use the rungs should be checked for safe use.
19. Wooden scaffolds shall not be used in areas where fire / fire products are expected
20. Ropes made of jute / Plastic and other fire prone material shall not be used to tie up scaffolding components together
21. The platform should have permanent hand rail and mid rail with Toe board without fail.
22. All platforms are to be tightly planked for the full width of the scaffold, except as may be necessary for entrance openings. Platforms shall be secured in place.
23. On suspension scaffolds designed for a working load of 500 pounds, no more than two workers are permitted to work on the scaffold simultaneously. On suspension scaffolds with a working load of 750 pounds, no more than three workers are permitted on the scaffold simultaneously.

24. Requirements for different types of Scaffolds:

A. Suspended Scaffold

i. Suspended scaffolds are platforms suspended by ropes, or other non-rigid means, from an overhead structure.

ii. Requirements for use are to be preapproved by HSE Head, under a specific Permit to Work.

B. Rolling Scaffolds

i. The height of rolling scaffolds shall not exceed three times the minimum base dimension.

ii. The minimum base dimension of rolling scaffold will be 1.25 meters (4 feet).

iii. Adequate help must be provided when moving a rolling scaffold.

iv. Secure or remove all loose materials, equipment and tools before moving a rolling scaffold.

v. No one is permitted to ride a rolling scaffold when it is being moved. Castor brakes must be locked-on when the scaffold is not being moved.

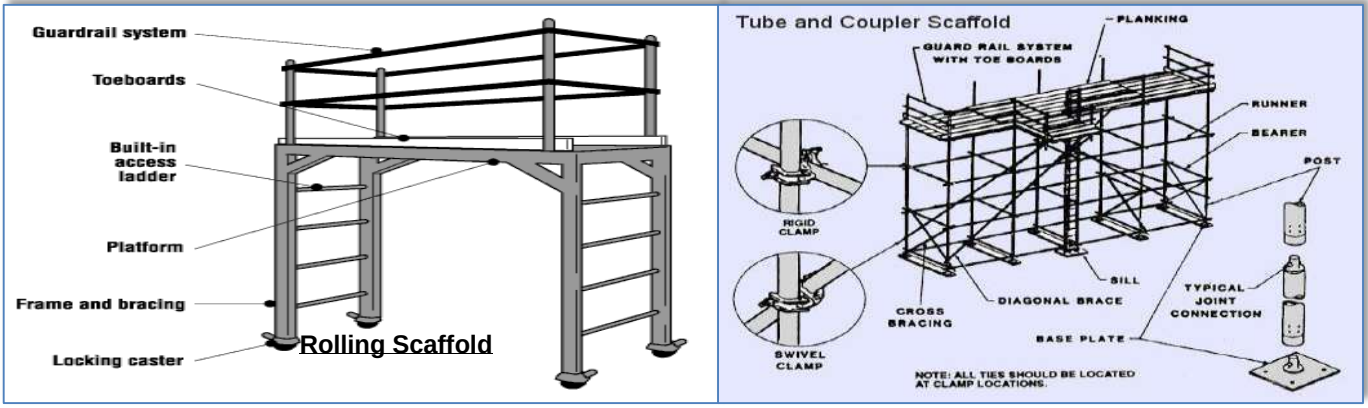


Fig. 13.2.1.3 Types of Scaffolds

25. Scaffold Tagging

Scaffolds being erected, modified or dismantled must be tagged as suitable for use. The scaffolds can only be accessed by those involved with the process.

GREEN scaffold tag- shall be fixed when scaffold is complete and safe for use, signed and dated by the scaffolding competent person daily.

RED scaffold tag – to be fixed if scaffold is in some way defective and cannot be used or is still under erection.

Examples of scaffold tags:

Fig. 13.2.1.4 Scaffold Tagging

13.2.1.4 Ladder Safety

A sketch of the ladders proposed to be used shall be prepared and approval of the BHEL Engineer obtained prior to construction / use

Safe Use of Ladders:

1. Fall protection is required when working on a ladder above 2 meters and when climbing above nearby guardrails.
2. Ladders must be inspected prior to use and by a competent person quarterly, with documentation.
3. Use portable ladders for height up to 4 M only
4. Provide fixed ladders for height above 4 M
5. Place the ladder at an angle of 75 degrees (approx.) from the horizontal (1:4)
6. Extend ladder at least 1 M above the top landing
7. Secure top and bottom of the ladder firmly to prevent displacement- anti skid lining at the bottom
8. Ensure that the width of the ladder is not less than 300 mm and distance between rungs is not more than 300 mm
9. Provide landings of minimum size 600 x 600 mm at intervals not more than 6 M for fixed ladders. Check the ladders daily for any defects
10. Ensure that the areas around base and top of the ladder are clear. Getting on and off the ladder is more hazardous than using it. Use a mudsill if the ladder is to rest on soft, lose or rough soil
11. Do not use ladders of conducting material near power lines, and only use ladders near power line or other energize system with exposed parts if they are confirmed locked-out and de-energized.
12. Stand no higher than the fourth rung from the top for carrying out any job standing on a ladder.
13. Never reach out from a ladder to perform work where your belt buckle protrudes past the ladder rung.
14. Always face the ladder while climbing up or down

15. Maintain three-point contact while climbing up or down a ladder i.e. two hands and one foot or two feet and one hand on the ladder at all the times.
16. Avoid climbing up or down a ladder while carrying anything in hands. Lift tools, equipment and materials with a rope.
17. Work from portable and extension ladders near guardrail where fall expose exists over the guardrail regardless of height, and above 2.0 mtr. heights from the working/walking surface will require the use of personal fall arrest equipment

13.2.2 EXCAVATION & CIVIL WORKS

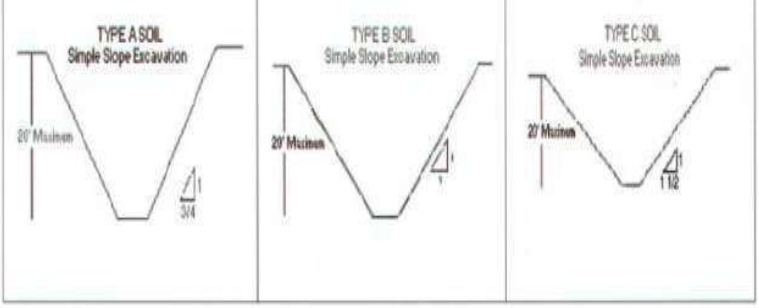
All safety precautions shall be taken for foundation and other excavation marks as per IS-3764.

13.2.2.1 Excavation

The following safety measures are to be ensured before and during excavation:

1. All Excavation activities more than with depth of 1.22 meter or more shall require and Excavation Work Permit
2. Check for underground utilities like electrical / telephone cables, sewage, water lines and proper care has to be exercised to protect and prevent damage to it
3. Proper and adequate slope is maintained while excavating
4. Adequate shoring or sheeting is done wherever require to prevent soil sliding
5. Safe access through ladder or steps for exit & entry to excavation
6. No material /excavated soil is kept within one meter from the edge
7. Safe way is planned and provided for movement of HEM /transport equipment near excavation
8. Safety helmet and shoes/gum boots are provided and worn by the workmen at excavation works
9. Dewatering arrangement is made where water seepage is prevailed.
10. Stop blocks are provided to avoid vehicles reversing into the excavated trenches
11. Danger signs /Caution boards are displayed at work spot
12. Hard Barricading is provided at excavated pits. It should be made of scaffolding pipe and clamp with reflective nets.

Soil Type	Height/Depth ratio	Slope Angle
Stable Rock	Vertical	90 deg.
Type A	¾ : 1	53 deg.
Type B	1 : 1	45 deg.
Type C	1½ : 1	34 deg.



Determining Soil Type

Type	Description	Examples
A	Cohesive soils with an unconfined compressive strength of 1.5 tons per square foot or greater.	Clay, silty clay, sandy clay, clay loam and in some cases: silty clay loam and sandy clay loam.
B	Cohesive soils with unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf.	Angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases silty clay loam and sandy clay loam.
C	Cohesive soils with unconfined compressive strength greater than 0.5 tsf or less.	Granular soils such as gravel, sand and loamy sand; submerged soil or soil from which water is freely seeping; submerged rock that is not stable.

Fig. 13.2.2.1 Excavation Reference

13.2.2.2 Piling

Ensure the following precautionary measures before starting piling works:

1. Inspection of piling equipment by responsible person for its condition before initiating piling operation.
2. Checklist and OCP for piling to be prepared using manufacturer's instructions and used
3. Testing and its certification wire rope, slings, D-shackles, chain pulley blocks using in the process of piling work by competent person
4. Adequate support and secured foundation of the piling equipment to avoid toppling
5. Hoses should be lashed and adequately secured
6. Proper work platform is to be provided on piling frame
7. Safe work procedures and close supervision to prevent unsafe acts of operators/any unsafe conditions that may arise
8. Only experienced and trained operators are engaged for the piling operation
9. Provision of Personal Protective Equipment (PPE) like safety shoes/gumshoes/safety helmet/safety belt etc. and its use by their workmen.
10. Special care and precautions If work is near electrical live cables/ electrical equipment
11. Cordoning of work area to prevent un authorized entry
12. Guarding of revolving parts
13. Specific measures to prevent over turning of pile driver/missing of hammer/ hammer movement out of range

13.2.2.3 Batching Plant

Following Safety considerations for batching plant are to be ensured:

1. Modern type batching plant should be used in which all the moving parts are protected and emergency and safety features are incorporated.
2. Installation of external Electric moto-vibrators in the feeding hopper of all batching plants to reduce human intervention.
3. Installation of safety devices like pull-chord on both the sides of conveyor for stopping the conveyor in emergency
4. Workers carrying cement / sand to be given appropriate PPEs like respiratory masks & gloves.
5. Conveyor belt/rotating parts must be guarded properly.
6. Safety awareness shall be inculcated in workmen about the risk involved in rotating parts.
7. The agency shall ensure to erect the batching plant as per drawing including installation of all safety devices as provided by manufacturer and witnessed by BHEL Engineer in charge before starting of machine in future.
8. Safety audit to also focus on Batching plant.
9. The site shall impose penalty on the agency who has violated the safety norms as per contract.

13.2.2.4 Mobile Plant

Mobile plant includes tractors, trailers, dumpers, excavators, bulldozers, road rollers etc. for earthmoving purpose and concrete mixers, concrete transit mixtures, concrete pumps etc for concreting purpose. Due to the very nature of their function and movement in difficult terrains, congested areas, working in tandem with manual work and other operations the danger is inherent.

Automatic reverse camera with reverse horn connected with reverse gear is compulsory for all moving machineries.

Following Safety measures to be ensured for Mobile Plant:

1. Where movement around site is involved, routes should be planned, obstruction free and well maintained
2. Observe specified speed limits
3. Operating personnel should be aware of associated risks and its preventive measures
4. Only experienced, trained and authorized persons with valid license (wherever applicable) should operate the mobile equipment/vehicles
5. Provide and use Warning lights and reverse horn for cautioning the people around
6. Operation should be on level and stable ground with adequate working clearance.
7. Loading of out riggers/stabilizers should be well within safe ground bearing capacity
8. No person should be on equipment or vehicle during loading and unloading of material
9. Operators should be protected by warning barriers or switching off power when working in close proximity of overhead power lines
10. The equipment /vehicles should be well maintained and provided with effective brake system and other safety devices (wherever require)
11. Rotating parts of equipment should be adequately guarded
12. Provide necessary personal protective appliances and ensure its use by the operating personnel Ensure effective measures at source to control harmful emissions, dust, fumes contaminating atmosphere and cause health hazards to the operators and people in the vicinity.
13. No overloading/over stressing of vehicles/plant is allowed
14. Hoses, pipes, receivers, gauges and valves involved in carrying out hydraulic fluid/ compressed air should be checked for leaks and tested prior to operation.
15. Adequate safe clearance for swing and movement is to be judged during operation of Concrete mixer
16. Setting of machines on firm and level ground with wheel locked to prevent movement of machine
17. Proper instructions and Special precautions are to be ensured to prevent entry in to the danger zone of projectile of bucket while dropping bucket
18. Operator leaving work spot should ensure that the equipment/vehicle is kept in neutral position and place on firm and level ground.
19. The hand brake should be kept in position and block road wheels as additional safety measure
20. Blades/buckets should be kept low while moving
21. The dozer blades should not be used as brakes except in emergency
22. The ground should be examined for its bearing capacity and general safety especially when operating road roller at the edges of slopes, embankments.
23. The roller should not be moved downhill with the engine out of gear
24. If operating near excavations the following precautionary measures are to be ensured
25. Barricading, edge protection to prevent fall of persons/vehicles over running while reversing etc.
26. Suitable support system and adequate allowance to avoid the danger of side collapsing
27. Experienced signaler /attendant should be always accompanied with operator/driver for proper direction /signal and also to caution others in the working Zone during operation of mobile plant

13.2.2.5 Concrete Vibrators

1. Revolving parts/belt drives should be adequately guarded and Vibrating unit shall be completely enclosed and have suitable overload relays and effectively earthed
2. Ensure sufficient length of cable to the Vibrator.
3. Ensure electric starters and other accessories are firmly fixed adequately supported
4. Ensure locking of needle load while inserting needle in to the vibrator,
5. Ensure periodical lubrication and maintenance

13.2.2.6 Concrete Mixers

1. Setting of machines on firm and level ground with wheel locked to prevent movement of machine
2. Proper instructions and Special precautions are to be ensured to prevent entry in to the danger zone of projectile of bucket while dropping bucket

13.2.3 WELDING & GAS CUTTING SAFETY (HOT WORK)

1. All Hot Work shall require a Hot Work Permit
2. Inbuilt Voltage Reduction Device (VRD) equipped arc welding machine will only be allowed for work.
3. There shall be flash-back arrestors conforming to IS-11006 at both cylinder and burner ends. Damaged tube and regulators must be immediately replaced.
4. All safety precautions shall be taken for welding and cutting operations as per IS-818.
5. When possible, items to be welded, cut, heated, etc. shall be moved to a safe location free of combustible or flammable material. If this is not possible, then all combustibles/ flammables that can be removed from the area shall be removed within a 35-foot circumference and a positive means of confining arcs and sparks generated by the process shall be ensured and additional person(s) shall be stationed as fire-watch for the area(s) still exposed, along with obtaining the Hot Work Permit as applicable.
6. Appropriate fire-fighting equipment is to be available in close proximity of any welding and gas cutting operations at all times suitable for the type of Fire.
7. Drums, tanks, and similar containers that have contained flammable or toxic material shall not be welded, cut, or heated until they have been made safe by water filling, thorough cleansing or similar accepted practices. The container shall also be ventilated during the welding, cutting, or heating process.
8. Proper ventilation is required for any welding or torch operations performed in a confined space.
9. Any welding or gas cutting operations performed on metals of toxic compounds or coating such as zinc, stainless steel, lead, cadmium, chromium, and beryllium shall be properly ventilated and/or proper respiratory protection shall be worn by any person that could be exposed to fumes, vapors, and gasses created by the welding and gas cutting processes.
10. Wherever it is practical, all arc welding operations shall be shielded to prevent direct light rays or sparks from contacting persons in the vicinity or from reaching areas normally used to travel through or into the vicinity. Where this is not practical, persons who shall be in the area are to use proper eye and skin protection. Other persons who are not participating in the welding or gas cutting operations are not to be allowed into the hazard zone.
11. Welders and other employees who are exposed to arc welding radiation shall wear suitable clothing and protective apparel to prevent burns and other types of ultraviolet radiation damage to the skin.

12. Arc welding machines shall be shut down when being moved or when they are not in continuous use. Electrode holders left unattended shall have electrodes removed and shall not be left where they might contact employees or conducting objects.
13. Arc welding power supply cable shall be of proper rating and material, e.g. copper.
14. Welders shall guard against allowing materials adjacent to or behind them to reflect radiation back toward them or towards others in the area. Reflected radiation can cause skin burns and eye flash burns.
15. Valve caps shall be in place when cylinders are not in use. Valve caps shall never be used for lifting the cylinder vertically.
16. Torches shall only be lit by approved strikers; never with matches, cigarette lighters, or hot-work.
17. **Splatter / Slag Collector:**

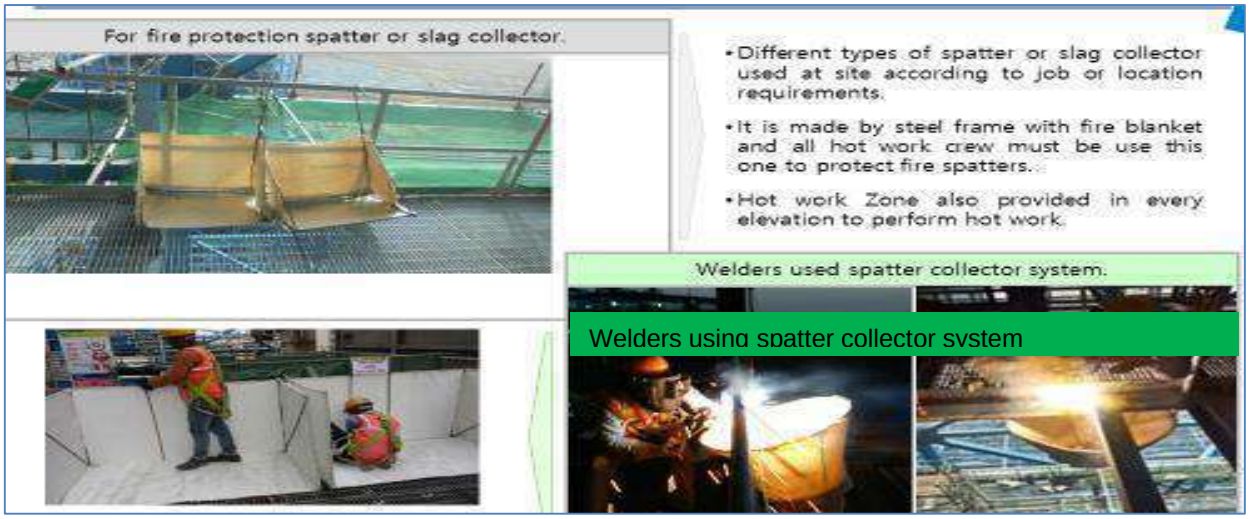


Fig. 13.2.3.1 Splatter / Slag Collector

While carrying out job at height, the sparks or molten slag shall be prevented from falling down by putting a fire-resistant (non-asbestos) sheet or patter/ slag collector or even MS Sheet. The passage of falling sparks or molten slag shall be barricaded till ground floor and any cable/ tubes/ any other objects interfering in the passages hall either be removed or covered with Fire-resistant sheet or MS Sheet.

13.2.4 COMPRESSED GAS

1. All cylinder valves shall be closed when any work is finished and when any Cylinders are empty or being moved. Valve protection caps shall be placed and secured properly before gas cylinders are transported, moved or stored.
2. Compressed gas cylinders shall be secured in an upright position with chain or appropriate means during storage & use. However, a trolley shall be used for transportation.
3. Compressed gas cylinders shall always be secured from tipping or falling, whether in use, in storage or in transit. The cylinders shall always be secured upright, except during times when actually being hoisted or carried.

4. When cylinders are transported by powered vehicle they shall be secured in a vertical position.
5. Regulators shall be removed when cylinders are not in use or are in transit, unless the cylinder is firmly secured on a special carrier designed for this purpose.
6. Gas cylinders are not allowed to be used in man-basket when occupied.
7. Cylinders containing oxygen or fuel gasses shall not be taken into confined spaces.
8. Oxygen cylinders shall be stored a minimum of 6 meters from fuel gas cylinders or shall have an approved firewall between them.
9. All cylinders shall be kept at a safe distance from welding or cutting operations or shielded from arc/ sparks / slag.
10. All cylinders shall be placed where they cannot become part of the electrical circuit.
11. Oxygen and acetylene shall not be stored together. Oxygen must be separated from acetylene (or ANY fuel gas) or combustible material by at least 20ft or a barrier with a 30-minute fire resistance rating.
12. All Cylinders should be stored upright in a designated area with labels for the type of gas. All applicable precautions to be ensured during storage
13. Oxygen and fuel gas regulators, hoses and associated equipment shall not be altered and shall be in proper working order while in use.
14. Compressed air can be extremely dangerous if allowed to penetrate the skin. As such, the use of compressed air to clean off yourself or other workers shall be strictly prohibited.
15. All gas cylinders shall be stored in upright position. Suitable trolley shall be used for cylinder movement, the design of which shall be submitted to BHEL Engineer for approval.
16. No of cylinders shall not exceed the specified quantity as per OCP
17. Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dragged, struck or permitted to strike each other violently.
18. All cylinder should be kept only in cylinder trolley.
19. Cylinder shall be transported in upright vertical position by suitable mean.

13.2.5 LIFTING & RIGGING SAFETY

1. All Heavy / Complex Lifting operations as defined in Clause 6.12 shall require a Lifting Work Permit. A written rigging procedure and plan must be prepared for all individual heavy/ complex lifting operations.
2. All the cranes and lifting tools & tackles shall be inspected on daily / weekly basis as well as monthly by expert as per applicable formats.
3. In addition, inspection / certification as mandated by law shall be carried out wherein these shall be tested and certificates of fitness shall be obtained from 3rd party State Govt. approved competent agency before deploying at site and later periodically. BHEL shall be given advance intimation of any such inspections
4. The last date of Third-Party Inspection and the next Due date shall be conspicuously displayed on all cranes. A copy of certificate shall be pasted on operator's cabin of all the lifting equipment.
5. Following requirements shall be mandatorily followed, wherever applicable:
   a. The manufacturer's instruction for maintenance shall also be followed. All safety measures shall be followed.
   b. All tools tackles, lifting appliances; material-handling equipment etc. used by the subcontractor shall be of safe design and construction.

c. The operators, slingers and signalers shall be qualified as per IS 13367 (part-1):2003 “Safe use of cranes- code of practices”.
d. There shall be a person responsible for co-ordination among cranes where multiple cranes are used, and lifting over load chart of the crane to be avoided.
e. Mobile phone should be banned for crane operator and lifting operation. Only walkie talkie shall be allowed in rigging/Lifting purpose.

Lifts/Movements between 5 Tons and 20 Tons:

a. Shall include a rigging plan, detailing schematic representation of the handling/lifting operations that must be included on the Method Statement.
b. When performing similar lifts of identical items, only one rigging plan need be prepared, provided each of the lifts can be performed in accordance with the rigging plan.

Lifts/Movements Less Than 5 Tons:

An equipment rigging plan is not required for lifts less than 5 tons, safety measures are covered in the JSA.

13.2.5.1 Personnel Lifts (Man-Basket / Jhoola):

The design of personnel man basket shall be submitted to BHEL Engineer for approval before use. Relevant permit (Height work & others as applicable) shall be completed prior to lifting any people, along with a rigging plan.

a. A separate Lifeline / fall arrestor anchored to a fixed structure outside of Jhoola shall be provided for the workers inside the basket. All occupants of the basket shall have Safety Harnesses equipped with rope grabs, which are to be hooked to the vertical lifeline.
b. Man-basket shall be used where access through ladders or scaffolding is not feasible.
c. Man-baskets shall be designed and engineered by a manufacturer (job made man-baskets are not allowed, unless designed and tested by a certified engineer), and built robust with MS Angles and flats or plates or channels only.
d. Guard rails top and mid, must be in place and screened-in to avoid material from falling out of basket. The factor of safety shall be 200%.
e. It shall have a door with double latches and shall open inside. Anchor points shall be identified within the man-basket.
f. The man-basket shall be thoroughly inspected and load tested and a trial run performed without personnel before being put to job.
g. It shall be treated as a lifting tool (T&P Item) and shall undergo same certification cycle and inspection as other lifting equipment.
h. An additional sling of required lifting capacity shall be fixed the man-basket main lifting point and attached to the crane above the ball or block.
i. While lifting man-basket, the crane shall maintain a uniform speed of lift without any swing.
j. Once man-basket reaches the destination, the lift brakes shall be locked as long as the basket remains at that point. The same care shall be taken in its descent.
k. As for hanging man-basket, the same shall be hung off a rigid structure with help U-shaped handle welded to man-basket. This shall be tested once in a year by a competent person.

l. Use of Rebar steel for making and monkey-ladder must be avoided.

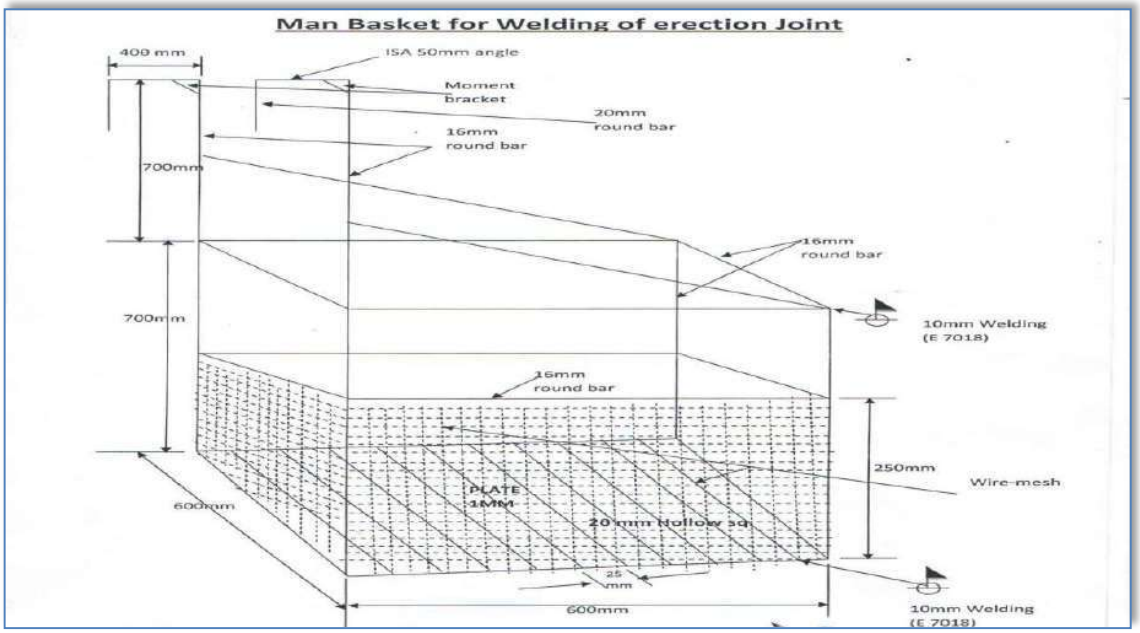


Fig. 13.2.5.1 Man Basket for Welding Erection Joint

13.2.5.2 Cranes & Hoisting Equipment:

This section provides the guidelines to ensure proper rigging and lifting activities are accomplished safely and in accordance with applicable specifications, codes, and regulations.

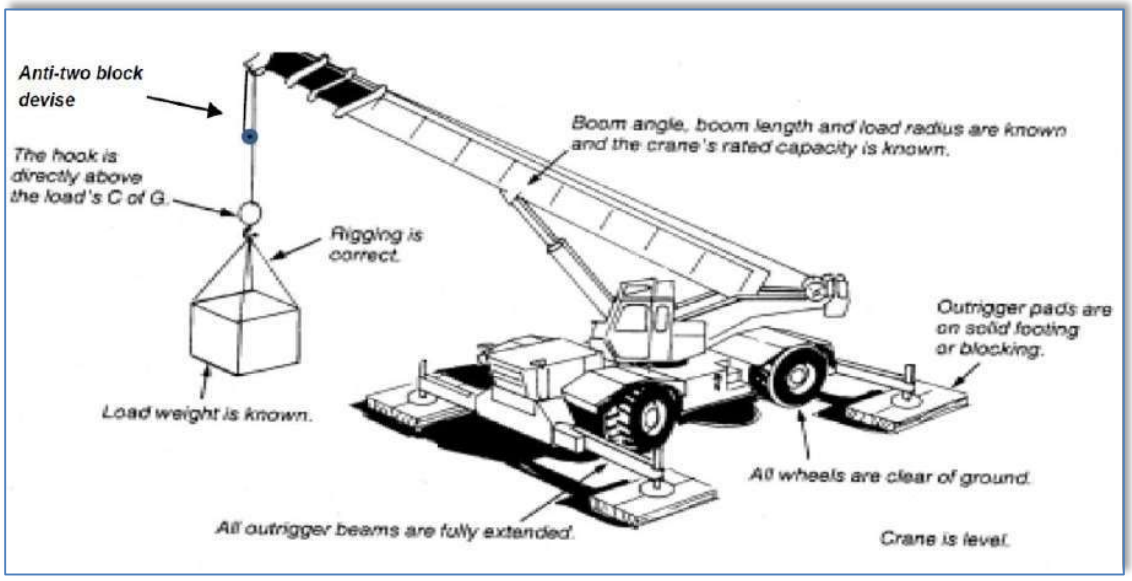


Fig. 13.2.5.2 Proper Crane Setup

a. On every crane or piece of hoisting equipment notices of all rated load capacities, recommended operating speeds, and any hazard warnings or special instructions shall be conspicuously posted. All instructions and warning shall be visible from the equipment operator ‘s station.
b. Cranes shall have an Anti-Two-block safety device installed
c. All mobile cranes shall have overload and backup alarms, load angle indicators and limit switches
d. All areas within swing radius of cranes that are potentially accessible by pedestrian, vehicular, or equipment movement shall be barricaded to prevent anyone or any vehicle or equipment from being struck by the crane or hoisting equipment, or its load(s).
e. No part of the lifting equipment or its load shall be within the distance as specified in the Indian Electricity Act from an energized power line

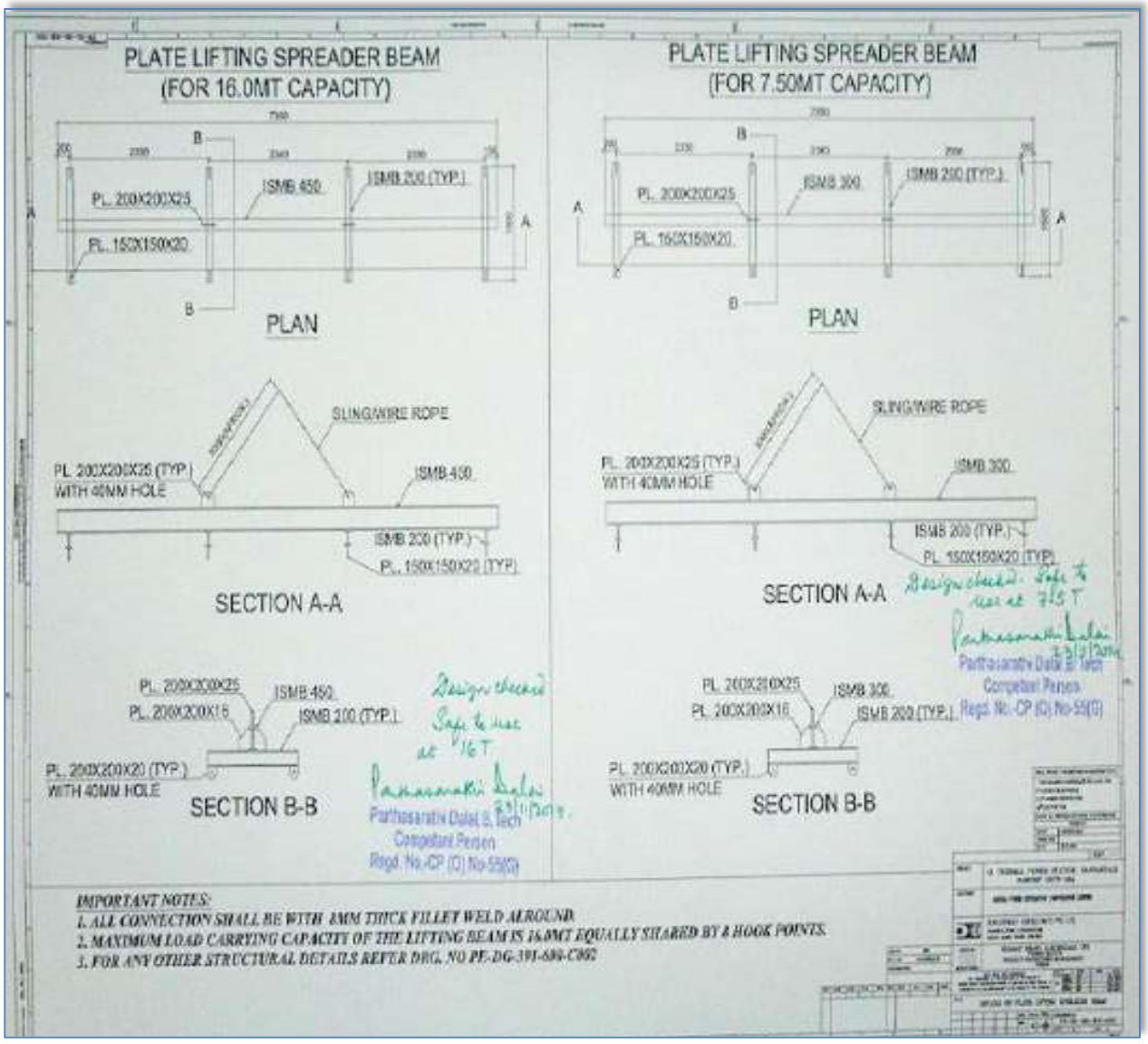


Fig. 13.2.5.3 Typical Plate Lifting Spreader Beam Configuration for 7.5 MT and 15 MT Loads

f. Cranes shall have annual certified third-party inspection and be inspected before use by the operator. Any defects shall be corrected before use. Logs of crane inspection shall be kept with the crane.
g. Make certain that the rigging personnel, material, and equipment have the necessary capabilities for the job and are in safe condition.
h. Communicate with person(s) directly responsible for accomplishing the work and / or work area to establish requirements/responsibilities and make certain that all preparatory work is complete.
i. Mats/Pads must be used on all lifting equipment, equipped with out riggers.
j. Pick and carry must have the load secured to the rig in front.
k. Only BHEL Approved Plate Lifting Spreader Beam configuration shall be used (Sample in Fig. 13.2.4.2)
l. Crane operators must follow the following:

1. Pass an annual Operator's Physical examination
2. Carry a valid training certification card at all time while operating issued by the Govt. or other recognized institute.

13.2.5.3 Safe Rigging Practices

a. Review the planned operation and requirements with the operator and rigging crew.
b. Ensure a pre-lift meeting is conducted with crane operator, tagline operator, signal personnel, and Safety Manager.
c. Designate a qualified person from the rigging crew to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desire clearance by visual means.
d. Clear the lift area of all unnecessary personnel.
e. Hydras shall only be allowed for loading & unloading works & shall not be allowed to move with load

13.2.5.4 Rules for Safe Rigging

1. Use loops, thimbles and corner pads to prevent damage to slings when used around corners or on cutting edges.
2. Never allow wire rope to lie on the ground for any length of time or on rusty steel or near solvents, chemicals or corrosive substances.
3. Slings must not be pulled from between or under loads with load resting on the sling.
4. Keep all rope away from flame cutting or welding operations.
5. Never use rope as sling material.
6. Never wrap a wire rope completely around a hook.
7. Do not bend wire rope near any attached fitting.
8. The sling must be selected to suite the most heavily loaded leg rather than the total weight when using multi-legged sling to lift loads in which one end is heavier than the other.
9. When using 3 and 4-legged sling configurations, any two legs must be capable of supporting the entire load.
10. Where possible, wire rope choker hitches must include a shackle with the eye around the shackle pin to prevent breaking wires of the choke. The choker hitch must be "snugged down" prior to lifting, not after tension is applied.

11. Unless authorized by the hook manufacturer when more than two rope eyes are placed over a hook, install a shackle, pin resting in the hook, and place the rope eyes in the bowl of the shackle.
12. Properly rig all loads to prevent dislodgment of any part.
13. Use guide ropes or tag lines to prevent the rotation or uncontrolled motion of the load when necessary.
14. Loads must be safely landed and properly blocked before being unhooked and unslung. Tag lines must not be used in situations that jeopardize the safety of the lift.
15. Lifting beams must be plainly marked with their weight and designed working load and must only be used in the manner for which they were designed.
16. The hoist rope or chain must never be wrapped around the load. The load must be attached to the hook by slings or other rigging devices that are adequate for the load being lifted.
17. Multiple part lines must not be twisted around each other.
18. The hook must be brought over the center of gravity of load before the lift is started.
19. If there has been a slack rope condition, determine that the rope is properly seated on the drum and in the sheaves prior to lifting.
20. Keep hands away from pinch points as the slack is being taken up.
21. Leather gloves are recommended when handling wire rope.
22. Avoid impact loading caused by sudden jerking when lifting or lowering. Lift the load gradually until the slack is eliminated.
23. Never ride on a load that is suspended.
24. Avoid allowing the load to be carried over the heads of any personnel.
25. Never work under a suspended load until the load has been adequately supported from the floor and all conditions have been approved by the supervisor in charge of the operation.
26. Never leave a load suspended unless emergency evacuation is required.
27. Never make temporary repairs to sling.
28. The capacity of a sling is determined by its angle, construction, type of hitch and size.
29. Never lift loads with one leg of a multi-leg sling until the unused legs are made secure.
30. Never point load a hook unless it is especially designed and rated for such use.
31. Make certain that the load is broken free before lifting and that all legs are taking the load.
32. When using two or more slings on a load make certain all slings are made from the same materials.
33. Lower the loads on to adequate blocking to prevent damage to the slings.
34. Materials and equipment being hoisted must be loaded and secured to prevent any movement which could create a hazard in transit.
35. The weight of the hook, load block and any material handling devices must be included when determining crane capacity.
36. Calculated weights cannot exceed load chart without written approval.
37. Personnel must be completely clear of loads being picked up or set down by crane. Tag lines will be used to control the loads. Loads must not be touched by hand while placing/ moving.

13.2.5.5 Slings

a. Synthetic Slings

The following are rules for safe use of synthetic slings:

i. Synthetic slings must be marked to show the rated capacity for each type of hitch and type of web material.

ii. Nylon web slings must not be used where fumes, vapors, sprays or mists or liquids of acids or phenolic are present. Web slings with aluminum fittings must apply in this category.

iii. Synthetic web slings must be removed from service and destroyed if any of the following conditions are present:

a. Acid or caustic burns
b. Melting or charring of any part of the sling surface
c. Snags, punctures, tears or cuts
d. Broken stitches
e. Distortion of fittings
f. Synthetic web slings of polyester or nylon must not be used at or come in contact with temperatures in excess of 82°C
g. Polypropylene web slings must not be used at or come in contact with temperatures in excess of 93°C
h. Insulated hooks must be tested yearly to ensure insulation integrity to at least manufacturer's specifications.

iv. Wire Rope Slings must be removed from service and destroyed if any of the following conditions are present:

a. In (10) randomly distributed wires broken in one (1) rope lay, or five (5) broken wires in one (1) strand in one (1) rope lay.
b. Wear or scraping of one-third the original diameter of outside wires.
c. Kinking, crushing, bird caging or any other damage resulting in distortion of the wire rope structure such as:
d. Evidence of heat damage.
e. End attachments that are cracked, deformed worn.
f. Corrosion of the rope or end attachments.

v. Metal mesh slings must be immediately removed from service if any of the following conditions are present:

a. A broken weld or broken brazed joint along the sling edge.
b. Reduction in wire diameter of 25 percent due to abrasion or 15 percent due to corrosion.
c. Lack of flexibility due to distortion or corrosion.

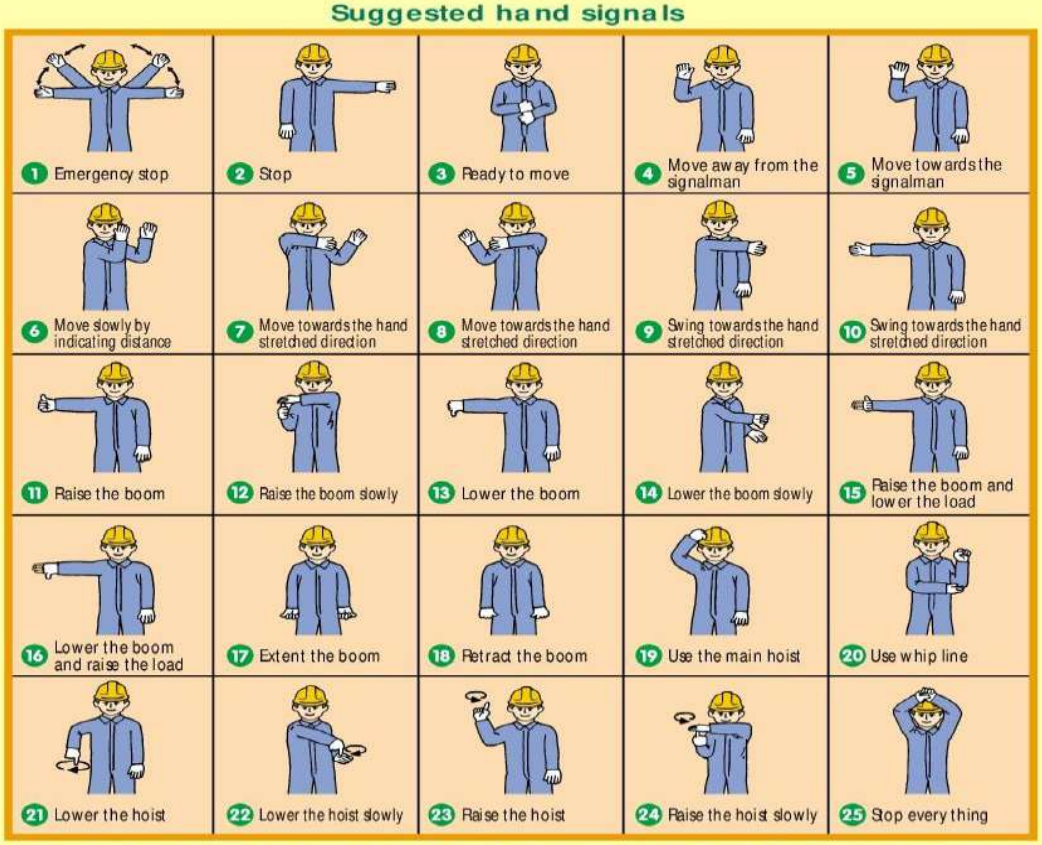
Note: Hand-made slings are not allowed for this project.

13.2.5.6 Requirements of Plate Clamps:

1. The rated load of the plate clamp must be marked on the main structure.
2. Care must be taken to make certain the load is correctly distributed for the plate clamp being used.
3. Do not allow load or plate clamp to come into contact with any obstruction.
4. The plate clamp must not be used for side pulls or sliding the load.
5. When lifting stainless steel or special alloys, ensure plate clamp is designed for use on the specific metal.

13.2.5.7 Signaling Practices:

- The "slinger" is responsible for attaching and detaching the load to and from the crane. He shall:
  - have received appropriate training on general safe lifting operations;
  - be capable of selectings lifting gears suitable for the loads;
  - liaise with the operator and direct the movement of the crane safely.
- The "signaller" is responsible for relaying the signal from the slinger to the crane operator. He shall:
  - have received appropriate training on general safe lifting operations;
  - be able to direct the movement of the crane and loads.



Note: During the lifting operation, either the slinger or signaller shall communicate with the operator. Other communication methods (e.g., wireless walkie-talkies, telephones, etc.) may also be used.

Fig. 13.2.5.7 Recommended Signaling Practices

13.2.6 DEMOLITION WORK

Before any demolition work is commenced and also during the process of the work the following shall be ensured, besides using the Work Permit:

1. All roads and open areas adjacent to the work site shall either be closed, suitably protected or restricted for movement

2. No electric cable or apparatus which is liable to be a source of danger nor a cable or an apparatus used by the operator shall remain electrically charged.
3. All practical steps shall be taken to prevent danger to persons employed from the risks of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render them unsafe.

13.2.7 T&PS GENERAL

1. All T&Ps/ MMEs should be of reputed brand/appropriate quality & must have valid test /calibration certificates bearing endorsement from competent authority of BHEL.
2. Subcontractor to also submit monthly reports of T&Ps deployed and validity test certificates to BHEL safety Officer as per the format/procedure of BHEL.
3. Tagging and punching in all lifting tool is compulsory with SWL, sr. no. and due date.
4. All T&Ps shall be inspected by authorized Third Party agency as per applicable frequency. BHEL shall be kept informed of any such scheduled inspection
5. All T&Ps shall be internally inspected in each quarter and colour coded as below.

13.2.7.1 T&P Color Coding Procedure:

Inspections and tests shall be documented by means of color coding which shall verify that inspections or testing are current and that all receptacles, portable Power tools, Lifting Tools & Tackles have been inspected and tested as required. The color codes used on the project shall be:

GREEN	BLUE	YELLOW	RED
January	April	July	October
February	May	August	November
March	June	September	December

Table. 13.2.6.1 T&P Color Coding Procedure

i. The cycle of colors shall be Quarterly as a minimum or as decided by BHEL. The color code tape / Sticker shall be clearly visible to designate the period for which the inspections and tests were conducted.
ii. Following the initial inspection, the equipment must be color-coded quarterly as per color-coding instructions that will be issued by the subcontractor.
iii. Fire extinguisher with the current month color-coding inspection sticker must be provided and secured in the platform.
iv. All slings shall be regularly inspected in accordance with the requirement of the project for frequent and periodic inspections and discard immediately if they fail to meet the minimum requirements of the project.
v. The Subcontractor's Safety Officer shall ensure that all PPE is inspected prior to its issue. He is to ensure all subcontractor personnel are using safe and proper PPE equipment. Regular inspections on the PPE shall be carried out and personnel not adhering to those inspections shall be removed immediately from the site.
vi. A five (10) day interval period shall be given into each monthly color code change. During this five (10) day period either color shall be acceptable.

13.2.8 CHEMICAL HANDLING

1. Displaying safe handling procedures & MSDS for all chemicals such as lube oil, acid, alkali, sealing compounds etc. at work place.
2. Where it is necessary to provide and/or store petroleum products or petroleum mixture & explosives, the subcontractor shall be responsible for carrying out such provision / storage in accordance with the rules & regulations laid down in the relevant petroleum act, explosive act and petroleum and carbide of calcium manual, published by the chief inspector of explosives of India. All such storage shall have prior approval if necessary from the chief inspector of explosives or any other statutory authority. The subcontractor shall be responsible for obtaining the same.
3. The used containers of chemicals shall be segregated and disposed of suitably
4. In case the used containers need to be re-used, all traces of the chemical to be removed by thorough cleaning with detergents etc. under trained supervision

13.2.9 ELECTRICAL SAFETY

1. Only electricians licensed by appropriate statutory authority shall be employed by the subcontractor to carry out all types of electrical works. The subcontractor shall maintain adequate number of qualified electricians to maintain his temporary electrical installations.
2. The sub-contractor shall supply modern power distribution board of different combination (1-phase & 3-phase). All the distribution of power should be through modern PDB. Equipment drawing is mentioned below.
3. No PDB or any other distribution board shall be more than 03 (three) years of purchase. Only modern PDB with industrial sockets as shown in layout below to be allowed to use at site.
4. Power supply to all equipment at site to be routed through MCBs of appropriate rating. A ‘Power Supply Distribution Plan’ shall be prepared and submitted to BHEL Engineer for approval
5. All power supplies through cables shall be underground or overhead with height > 3mtrs.
6. All power distribution boxes shall be locked and the key controlled by site management of concerned subcontractor.
7. All individual equipment & tools at site shall be powered through Earth Leakage Circuit Breakers of 30 mA sensitivity.
8. These MCBs and ELCBs shall be regularly tested as per Clause 14
9. All fuses and fuse wires shall be of standard size and rating.
10. All electrical appliances used in the work shall be in good working condition and shall be properly double earthed other that armour earthling.
11. All extension boards shall have separate switches for all sockets / connections.
12. All portable electric tools used by the subcontractor shall have safe plugging system (industrial top & socket) to source of power and be appropriately earthed.
13. Providing adequate no. of 24 V sources and ensure that no hand lamps are operating at voltage level above 24 Volts especially in confined spaces like inside water boxes, turbine casings, condensers etc.
14. Electrical appliance shall have proper earthing and for appliances equal to & more than 415V shall have two separate earthing (as per IS-3043-1987)
15. Details of earth resource and their test date to be given to BHEL safety officer as per the prescribed formats of BHEL

16. The subcontractor shall use only properly insulated and armoured cables and conform to the requirement of Indian Electricity Act and Rules for all wiring, electrical applications at site.
17. BHEL reserves the right to replace any unsafe electrical installations, wiring, cabling etc. at the risk & cost of the subcontractor.
18. No maintenance work shall be carried out on live equipment
19. Adequate precautions shall be taken to prevent danger for electrical equipment. No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public
20. The subcontractor shall carefully follow the safety requirement of BHEL/ the purchaser with the regard to voltages used in critical areas.
21. Wiring and Branch Circuits Must be protected by a proper amperage over-current device such as a HRC fuse or circuit breaker. Such installations must be located so as to prevent physical damage to the wire conductors & panels.

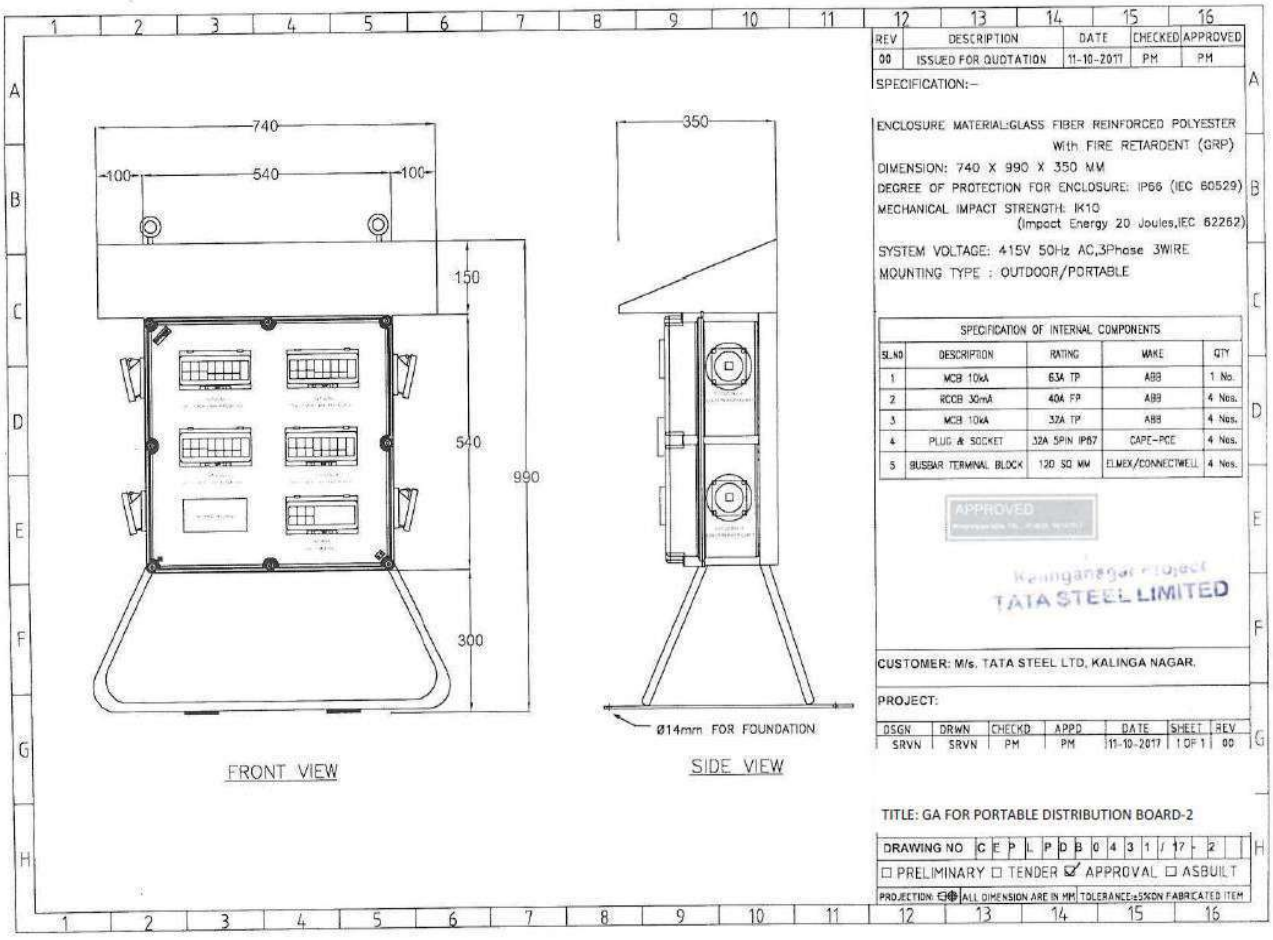


Fig. 13.2.9.1 Layout of a modern Power Distribution Board

13.2.9.1 Portable Electric Lights

a. Portable electric lights used in wet or potentially wet locations must be either low voltage type (24 volts or less) or protected by a GFI (ground fault interrupter).

b. They must be visually checked before each use and periodically while in use to assure their original integrity is maintained.
c. Cords with cuts, breaks, deep abrasions, etc. shall be taken out of service immediately.
d. Repairs to extension cords shall only be performed by qualified/ licensed electricians.
e. Must not be allowed to lie in wet or potentially wet areas.

13.2.9.2 Underground Cables:

a. Every electric line or cable of unknown origin that is discovered or exposed during a digging, drilling, probing, or similar operation is to be considered as energized and life threatening.
b. The senior company employee on the site will ensure that all necessary safety precautions are taken in order to isolate the line from all workers and the public.
c. Such precautions may include halting the operation if appropriate.
d. The senior company employee on the site is to then contact the proper authorities to have the line identified and either confirmed to be abandoned and/or made safe for continuing the work.
e. Any and all underground lines that are discovered or become severed must be considered energized on both sides, and be treated accordingly.

13.2.9.3 General Electrical Safety

a. In general, equipment or machinery being moved or transported must maintain minimum clearances of 25 ft. to all power lines.
b. TAG IN/ TAG OUT must be in force in Switch Room and all Distribution Boxes for live power line. The authorized person's name and contact no shall be displayed
c. Ensure "double insulated" three - core cables and three pin connectors are used and are properly ground "all insulated" types, all electrical tools and appliances must be manufactured for industrial use.
d. All connections shall be electrically and mechanically sound and properly insulated. Taped joints are not permitted. Connections to socket outlets must be made with proper plugs (industrial top and socket).
e. Splices in electrical cords are not permitted. Repairs must be made at the socket connection and retain the same mechanical and dielectric condition of the original connection.
f. Damaged or defective electric tools, equipment and extension cords, etc. must not be used and shall be tagged out of service, removed from the work area and taken back to stores.
g. Only licensed electricians are authorized to repair and work on electrical equipment. Tampering with electric tools or equipment by others could result in termination.
h. Temporary electric cabling should be elevated 2.2 meters above the floor/ground or covered for protection. It must be kept clear of walkways and other locations where it may be exposed to damage or create a tripping hazard.
i. Energized wiring in junction boxes, circuit breaker panels and similar places must be covered and locked at all times.
j. Areas with live high voltage wires or terminals must be barricaded against entry and warning signs posted Danger – High Voltage and Authorized Personnel Only.
k. Personnel should never work on energized equipment, de-energizing (lockout/tag out) the equipment is always the first requirement.

l. The lockout and tag out procedure will be used when testing or working on, or around, energized installation.
m. Working around energized equipment should never be done alone. A second electrician must always be available for assistance.
n. If lockout/tag out of the work is infeasible (must be demonstrated), work on energized electrical circuits must be approved by the Site In-charge. All safety precautions necessary must be taken, PPE use must be evaluated per the exposure and used, i.e high/low voltage gloves, insulated shoes, overcoats/aprons, face shields, and other protective equipment like insulated tools, blankets, mats, etc. must be used.
o. The welding machines earth leads shall be properly fixed without loose contacts. The earth cable only has to be used. No steel members shall be used as earth leads.
p. Electrical crews must be qualified for the equipment and tools they work on, including being trained in Cardio-Pulmonary Resuscitation (CPR) methods and First Aid for rendering help in the event of electric shock.

13.2.9.4 Qualified Persons for Electrical Works

One who is trained and wiremen licensed to Govt. of W.B. and familiar with the construction, operation and safety hazards of the equipment upon which they are permitted to work.

a. Qualified persons are intended to be only those who are well acquainted/experienced with and thoroughly conversant in the electric equipment and electrical hazards involved with work being performed.
b. Only qualified persons may be permitted to work on or near exposed energized parts. Such persons are required to have been trained in three specific areas:
c. Qualified persons must be capable of working safely on energized circuits;
d. Must be familiar with the proper use of special precautionary techniques and procedures bases on equipment and exposure; and
e. Must be familiar with required personal protective equipment, insulating and shielding materials, and insulated tools.
f. Qualified persons are expected to be able to evaluate unknown situations and adjust their activities in such a way that only safe work practices are used. Such behavior is the responsibility of the qualified person.
g. It is possible and likely for an individual to be 'qualified' with regard to certain equipment in the work place, and unqualified on other equipment they must know their limitation and stop work if not qualified on what equipment they were to work on.
h. An employee who is undergoing on-the-job training, who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training, and who is under the direct supervision of a qualified person is considered to be a qualified person for the performance of those duties. The process must be documented as proof.

13.2.9.5 Mandatory PPEs of electrical work on LV & HV

a. HV arc flash suit with protective hood (for protection of face and head) as specified for hazard risk category-4 in NFPA-70E or similar IS specification for working on HT switch gear (for all voltage >690 V) to the concerned licensed electrician or competent person.

b. LV arc flash jacket/FR as specified for hazard risk category-4 in NFPA-70E or similar IS specification having ATPV rating of 8.5 to 9 cal/cm2 for working on LV (>260V and <=690V) to the concerned licensed electrician or competent person.



c. The LV arc flash jacket as shown above shall be worn continuously while working on LV (>260V and <=690V). The color specification of LV arc flash jacket should be blue.
d. Electrical hand gloves should have following specification: Flame resistance, arc flash and cut protection of voltage rating (>260V and <=690V).
e. Electrical safety over shoe of relevant IS make for foot protection of licensed electrician or competent person while working in HV & LV line or equipment.

13.2.10 USE OF HAND TOOLS AND POWER-OPERATED TOOLS

1. General Provisions

a. All hands and power tools and similar equipment, shall be maintained in safe condition.
b. When power operated tools are designed to accommodate guards, they shall be equipped
c. with such guards, when in use;
d. Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains and other reciprocating, rotating or moving parts of the equipment shall be similarly guarded;
e. Personnel using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases shall be provided with the particular personal protective equipment necessary to protect them from the hazards;
f. All hand-held powered platen sanders, grinders, grinders with wheels of 5 cm or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks of 0.5 cm wide or less shall be equipped with only a positive on-off control.
g. All hand-held powered drills, tappers, fastener drivers, horizontal, vertical or angle grinders with wheels greater than 5 cm in diameter, disc sanders, belt sanders, reciprocating saws, saber saws and other operating powered tools shall be equipped with a momentary contact on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

2. Hand Tools

a. The subcontractor shall not issue or permit the use of unsafe hand tools;
b. Wrenches including adjustable pipe end and socket wrenches shall not be used when saws are sprung to the point that slippage occurs;
c. Impact tools such as drift pins, wedges and chisels shall be kept free of mushroomed heads;

d. The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight on the tools.

3. Power Operated Tools

a. Electric power operated tools shall be either of the approved double-insulated type or shall be grounded;
b. The use of electric cords for hoisting or lowering loads shall not be permitted;
c. Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming incidentally disconnected;
d. Safety clips or retainers shall be securely installed or maintained on pneumatic impact (percussion) tools to prevent attachments from being incidentally expelled;
e. All pneumatically riveting machine staplers and other similar equipment provided with automatic fastener feed, which operate at more than 7 kg/cm2 pressure at the tool a safety device on the muzzle to prevent the tool from ejecting the fasteners unless the muzzle is in contact with the work surface;
f. Compressed air shall not be used for cleaning purposes except when the pressure is reduced to less than 2 kg/cm2 and that too with effective chip guarding. The 2 kg/cm2 pressure requirement does not apply to concrete form, mill scale and similar cleaning purposes;
g. The manufacturer's safe operating for hoses, pipes, valves, filters and other fittings shall not be exceeded;
h. Only personnel who has been trained in the operation of the particular tool shall be allowed to operate power-actuated tools;
i. The tool shall be tested each day before loading to see that the safety devices are in proper working condition. The method of testing shall be accordance with the manufacturer's recommended procedure;
j. Any tool found not in proper working order, or that which develops a defect during use, shall be immediately removed from service and not used until properly repaired;
k. Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any other person. Hands shall be kept clear of the open barrel end;
l. Loaded tools shall not be left unattended;
m. Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tiles, surface hardened steel, glass block, live rock, face brick or hollow tiles;
n. Driving into materials that can be easily penetrated shall be avoided unless backed by a
o. substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side;
p. No fastener shall be driven into a palled area caused by an unsatisfactory fastening;
q. Only non-sparking tools shall be used in an explosive or flammable atmosphere;
r. All tools shall be used with the correct shield, guard or attachment as recommended by the manufacturer.

4. Abrasive Wheels and Tools

a. All grinding wheel must be ISO certified only.
b. All grinding machines shall be supplied with sufficient power to maintain the spindle speed at safe

levels under all conditions of normal operation;

c. Grinding machines shall be equipped with suitable safety guards;
d. The maximum angular exposure of the grinding wheel periphery and sides shall not be more than 900, except that when the work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure shall not exceed 1200. In either case, the exposure shall begin not more than 8.650 above the horizontal plane of the spindle. Safety guards shall be strong enough to withstand the bursting of the wheel;
e. Floor and bench-mounted grinders shall be work-rests, which shall be rigidly supported and readily adjustable. Such work-rests shall be kept at a distance not to exceed 5 mm from the surface of the wheel;
f. Cup type wheels used for external grinding shall be protected by either revolving cup guard or a band type guard;
g. When safety guards are required, they shall be mounted as to maintain proper alignment with the wheel and the guard and the guard and its fastening shall be adequate strength to retain the fragments of the wheel in case of incidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 1800;
h. Portable abrasive wheel used for internal grinding shall be provided with suitable safety flanges;
i. When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only safety flanges, of a type and design and properly assembled so as to ensure that the pieces of the wheel will be retained in case of incidental breakage, shall be used;
j. All abrasive wheels shall be closely inspected and ring tested before mounting to ensure that they are free from cracks or defects;
k. Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place;
l. All employees using abrasive wheels shall be protected by suitable eye protection equipment.

5. Wood Working Tools

a. All fixed power-driven woodworking tools shall be provided with a disconnect switch that can either be locked or tagged in the off-position;
b. The operating speed shall be attached or otherwise permanently marked on all circular saws over 0.5 m in diameter or operating at over 3000 peripheral rpm. Any saw so marked shall not be operated at a speed other than that marked on the blade. When a marked saw is re-tensioned for a different speed, the marking shall be corrected to show the new speed;
c. Automatic feeding devices shall be installed on machines wherever the nature of the work will permit. Feeder attachments shall have the feed rolls or other moving parts covered or guarded so as to protect the operator from hazardous points;
d. All portable power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

13.2.11 START UP, COMMISSIONING AND TESTING:

There are various activities involved prior to commissioning- the major ones are -Hydraulic Test, Steam Blowing, Transformers Charging, Boiler Light Up, Rolling and Synchronisation and Full loading of unit.

a. These activities shall be personally supervised by the site executive along with the commissioning engineer.
b. Appropriate Work Permits shall be taken as applicable
c. The readiness of upstream and downstream system shall be ensured before taking up.
d. These shall be handled strictly by the authorized persons only and the team shall be suitably briefed about the activity including hazards & risks involved and control plan by the concerned executive-in-charge before start.
e. Entry of persons to the area of activity shall be suitably restricted and the emergency functions like Ambulance, first aid center and Fire station shall be intimated about the plan well in advance.
f. Tag-in/ Tag-out shall be in place while charging transformer and whenever necessary.
g. Electricians with valid wiremen license only shall be permitted to work on power lines.
h. The area and the passage shall be adequately illuminated.

13.2.12 FIRE SAFETY

The Fire Prevention, Protection and Preparedness Program is an integral part of the overall HSE Program. Effort and consideration must be given to safety, life and potential for delays in construction schedules and plant startup, as well as protection of property on a given project.

The purpose of which is to prevent

- Inception of fire
- Loss of life or personal injury
- Loss of Property
- Interruption of operations

Site-in-charge / Safety Officer will make periodical review of the site Fire Protection, Prevention Preparedness Programme, Site conditions and available fire protection equipment. It is very imperative that the Sub-contractors along with BHEL to establish good contact with Local fire station for availability of Fire tender in case of emergencies, in additional to their own fire equipment.

Fire Protection, Prevention and Preparedness Inspections - The Contractor /Sub-Contractor will be required to make frequent fire prevention inspections of his work site and operating facilities.

Deficiencies will be corrected at once.

- Area where Hot work activities are carried out (Gas cutting / Welding/ any other spark producing work) above a working spot, a GI / fire-resistant non-asbestos sheet or suitable material shall be placed to prevent the fall of hot sparks. A bucket of water shall be kept nearby while doing hot work
- Hot work shall be preferably carried out in a designated area with a standing Hot Work Permit, to be renewed monthly. The designated area shall have fire extinguishers.
- Any hot work outside designated area shall require a Hot Work permit and fire watch. No flammable material shall be stored within 35 feet from any fire load.

- Necessary fire extinguishers shall be kept at accessible area as per the chart below:

Fire Extinguisher Chart

Extinguisher		Type of Fire				
Colour	Type	Solids (wood, paper, cloth, etc)	Flammable Liquids	Flammable Gasses	Electrical Equipment	Cooking Oils & Fats
	Water	✓ Yes	✗ No	✗ No	✗ No	✗ No
	Foam	✓ Yes	✓ Yes	✗ No	✗ No	✓ Yes
	Dry Powder	✓ Yes	✓ Yes	✓ Yes	✓ Yes	✗ No
	Carbon Dioxide (CO2)	✗ No	✓ Yes	✗ No	✓ Yes	✓ Yes

1. All Electrical welding booths shall be equipped with appropriate Fire Extinguisher
2. Appropriate Fire Extinguishers shall be made within easy reach of all welding operations
3. Fire extinguishers shall be regularly tested and last checked date to be indicated on each.
4. Providing appropriate fire-fighting equipment at designated work place and nominate a fire officer/warden adequately trained for his job.
5. Subcontractor shall provide enough fire protecting equipment of the types and numbers at his office, stores, temporary structure in labour colony etc. Such fire protection equipment shall be easy and kept open at all times.
6. The fire extinguishers shall be properly refilled and kept ready which should be certified at periodic intervals. The date of changing should be marked on the Cylinders.
7. All other fire safety measures as laid down in the “codes for fire safety at construction site” issued by safety coordinator of BHEL shall be followed.
8. Non-compliance of the above requirement under fire protection shall in no way relieve the subcontractor of any of his responsibility and liabilities to fire incident occurring either to his materials or equipment or those of others.
9. Emergency contacts nos. must be displayed at prominent locations
10. Tarpaulin being inflammable should not be used (instead, only non-infusible covering materials shall be used) as protective cover while preheating, welding, stress relieving etc. at site.

Note: Due to peculiarities of the power plant construction sites, there would be locations in the construction areas of Boiler, Turbine, Generator, Transformer, etc. where different types of fire risk (classes of fire) may co-exist. Special care shall be taken while selecting and installing portable fire extinguishers for such locations so that all types of fire risk that may co-exist, are adequately covered. Similar special care shall be taken for storage areas.

Numbers and types of Fire Extinguishers shall be ensured as follows:

Sl. No	Type of Fire Risk (Class of Fire)	Extinguishing Medium & Relevant Indian Standard	Scale of Equipment (Minimum recommended)
1.	**CLASS 'A'** Fires involving ordinary combustible materials like wood, paper, textiles, rubber etc. (Ordinary hazard or low fire load)	WATER Soda acid type, water type (gas pressure) and water type (constant air pressure) IS: 934 -1976; IS: 940 -1976; IS: 6234 -1971	For every 600 square meter floor area or part, one 9-litre capacity. Minimum 4 numbers per floor or room; should not be required to travel more than 15 meter to reach any extinguisher.
2.	**CLASS 'A'** (Extra hazard & high fire load)	-do	-do – (Also, consult local fire authority).
3.	**CLASS 'A'** (Special hazards)	-do	-do – Extra provision For every 100 square meter floor area or part, one 4.5 Kg. CO2; minimum 2 numbers per room; should not be required to travel more than 10 meter to reach any extinguisher.
4.	**CLASS 'B'** (Fires in flammable liquids like oils, solvents, petroleum, products, varnishes, paints, etc. where blanketing effect is essential) (Storage and handling in small quantities)	FOAM / CARBON DIOXIDE / DRY CHEMICAL POWDER IS: 933 -1976; IS: 2878 1976; IS: 2171 1976; IS: 4308 -1982	For every 50 square meter floor area or part, 2 numbers 9 -liters foam or 5 kg dry powder; should not be required to travel more than 10 m in the area of storage to reach any extinguisher.
5.	**CLASS 'B'** (Bulk storage other than in tank form)	-do -	-do- (but minimum 3 numbers per room)
6.	**CLASS 'C'** (Fires involving gaseous substances under pressure where it is necessary to dilute the burning gas at a very fast rate with an inert gas or powder) (locations of storage and handling of gas cylinders)	CARBON DIOXIDE / DRY CHEM. POWDER. The best way to extinguish such fire is by stopping the flow of fuel gas to the fire. Container is kept cool with water spray. IS: 2878 1976; IS: 2171 -1976; IS: 4308 -1982	For every 100 square meter floor area or part; 2 numbers, 10 kg powder extinguisher or 6 kg C02; minimum 3 nos. per room; should not be required to travel more than 10 meter to reach any extinguisher.
7.	**CLASS 'D'** Fires involving metals like magnesium, aluminum, zinc, potassium etc. where the burning metal is reactive to water and which require special extinguishing media or technique	SPECIAL DAY POWDER IS: 2171 -1976 IS: 4861 -1968	For every 50 square meter floor area or part, 2 nos. 5 kg special dry powder; minimum 3 nos. per room; should not be required to travel more than 10 meter to reach any extinguisher.
8.	**MIXED OCCUPANCY** (electrical); Generators; Transformers; etc.	CARBON DIOXIDE DRY POWDER, IS: 2878 -1976; IS: 2171 -1976	For every 100 square meter floor area or part one 10 kg C02. Minimum 2 numbers for every location should not be required to travel more than 10 meter to reach an extinguisher.

13.2.13 PAINTING:

Requirements provide a detailed procedure to be implemented by all concerned employees and sub-contractors involved in painting activities.

Significant Environmental Hazards:

- Chemical hazard due to inhalation of lead fumes (lead containing paint)
- Chemical hazard due to inhalation of VOC's from paining operations
- VOC's from painting and coating operation
- Disposal of paints and coats drums

Control Procedure for Paining:

- Chemical products used in painting and coating operation shall have proper MSDS sheet in place. Whenever any doubt arises with respect to handling and safety point of view it should be accessed to all concerned.
- Toxic substances and hazards relate the toxic chemicals shall be identified.
- Proper PPE shall be used including plastic gloves appropriate overall etc.,
- Arrangement for cleaning of spillage shall be ensured

- Only trained workers shall be allowed and proper training should be imparted to the works.
- Exposure limits of the toxic substances shall be checked before starting the work and nobody shall be allowed to carry the work beyond the permissible limit.
- Ventilation or exhaust facility shall be provided at place where painting and coating operations are carried out.
- Overalls shall be supplied by the contractors/subcontractors to the workmen and adequate facilities shall be provided to enable the painters to wash at the cessation of work.
- Smoking, open flames or sources of ignition shall not be allowed in places where paints and other flammable substances are stored.
- A caution board in national /regional language **"smoking strictly prohibited"** shall be displayed in the vicinity.
- Suitable fire extinguishers/sand buckets shall be kept available at places where flammable paints are stored, handled or used.
- In case of indoor painting or painting in confined spaces, exhaust ventilating shall be provided. If adequate ventilation is not provided a proper respirator shall be provided and used by persons who are trained and fit tested.
- The VOC's from painting and coating operations shall not exceed the permissible level of CPCB/ SPCB norms. The paints and coats must be selected as per the guidelines.
- Workers shall thoroughly wash their hands and feet before leaving the work.

13.2.14 HAZARDOUS ENERGY CONTROL PROCEDURE

Hazardous Energy Control Procedures, known as "Lockout/Tagout (LOTO)" refers to specific practices and procedures to safeguard employees from the unexpected energization or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities.

Contractors must develop and submit a written LOTO program This requires that a designated qualified individual turns off and disconnects the machinery or equipment from its energy source(s) before performing service or maintenance and that the authorized employee(s) either lock and tag the energy-isolating device(s) to prevent the release of hazardous energy and test the machine or equipment to verify that the energy has been isolated effectively.

Minimum Requirements:

The following are minimum requirements that must be included in the Contractor's LOTO program:

Inspection of equipment by a trained individual who is thoroughly familiar with the equipment operation and associated hazards. Identification and labeling of lockout devices. Purchase of locks, tags, and blocks Development of a standard written operating procedure, permitted through a controlling authority that is followed by all workers.

General Requirements

The following steps must be taken to protect workers that install or service equipment and systems:

Follow the hazardous energy procedures and statutory regulations. Follow the manufacturer's service/repair instructions. Identify and label all sources of hazardous energy. Before beginning work, accomplish the following:

- De-energize all sources of hazardous energy:
- Disconnect or shut down engines or motors.
- De-energize electrical circuits.
- Block fluid (gas or liquid) flow in hydraulic or pneumatic systems.
- Block or secure machine parts against motion.
- Block or dissipate stored energy.
- Discharge capacitors.
- Release or block springs that are under compression or tension.
- Vent fluids from pressure vessels, tanks, or accumulators—but never vent toxic, flammable, or explosive substances directly into the atmosphere

Lockout and tag out all forms of hazardous energy including electrical breaker panels, control valves, etc. Make sure that only one key exists for each of your assigned locks and that access to the key is controlled. Verify by test and/or observation that all energy sources are de- energized.

After completion of the work, accomplish the following:

- Inspect repair work before removing the lock and activating the equipment.
- Make sure that only the worker that installed the lock removes his/her assigned lock.
- Make sure that all workers are clear of danger points before re-energizing the system.

LOTO Procedure;

PURPOSE AND SUMMARY

This procedure provides the requirements and responsibilities of Hazardous Energy Control and the process

for Lockout / Tag out (LOTO) of energy isolating devices (valves, circuit breakers, disconnect, etc.). Its use shall ensure that machinery, equipment, or systems are isolated from all potentially hazardous energy to prevent unexpected energization, startup, or release of stored energy which may cause personnel injury or property damage.

This procedure applies to all BHEL personnel and subcontractors working on the WBPDCL (1X660MW) STAGE- III projects where equipment must be taken out of service for the performance of work activities such as installation, maintenance, repair, construction, or equipment removal. The procedure may also be used to isolate equipment of which the energization or operation may present danger to personnel or property.

Lockout / tag out are not required for electrical equipment that can be unplugged from the source and the person performing the work has control of the plug.

This procedure shall be applied to prevent injury or damage caused by the unexpected release of active or stored energy. Hazardous energy sources could be in the form of the following:

- Electrical
- Hydraulic
- Chemical
- Thermal
- Mechanical
- Pneumatic

Preplanning of work activities includes the identification of all potential hazardous energy sources so that they may be properly controlled and isolated, locked, and tagged out.

Prior to initiating work activities on or around locked out / tagged out equipment, the equipment must be tested and tried by or in the presence of the person(s) performing the work activities.

RESPONSIBILITIES

- The Engineers in Charge is responsible for implementing and enforcing this procedure and approving lockouts /tag outs that impact the operation of the project.
- The Engineer in Charges responsible for authorizing Lockout /Tag out Requests.
- The Lockout / Tag out Coordinator is responsible for maintaining the Lockout / Tag out Log. Each shift should have a designated Lockout / Tag out Coordinator.
- The Isolator is responsible for determining the proper isolation devices and device positions required to isolate all potential energy sources so that the work stated on the Lockout /Tag out Request Permit may be safely performed. The Isolator must be familiar with the equipment and energy type(s) that require isolation. For this reason, in some cases the Isolator may be more than one person (i.e. Engineer, System Operator and/or Electrician). The Isolator shall position the specified device points, and apply locks and tags, and sign the tags and the LOTO Permit isolation point blocks.
- The Safety Manager is responsible for conducting an annual audit that is documented to ensure all procedures and requirements are current and being followed as written.

DEFINITIONS

Affected Employee: -

An employee whose job requires him/her to operate or use machinery or equipment on which servicing or maintenance is being performed under a lock out/tag out procedure or whose job requires him/her to work in an area in which servicing or maintenance is being performed under a lockout/tag out procedure

Authorized Employee: -

An employee who implements a lockout/tag out procedure on machinery, equipment, or systems in order that servicing or maintenance may be performed. Often an authorized employee and an affected employee may be the same person.

Danger “Do Not Operate” Tag

A tag used to identify energy isolation devices and specify the required position of the device. The tag should be affixed to the isolation device such that it is in plain view of anyone attempting to operate the device. The tags shall be sequentially numbered and shall specify the lockout/ tag out request number. The tag shall also state the purpose, and the expected duration of the lockout /tag out

Isolation Device

A device that is designed and intended to prevent the passage of energy. These devices, usually located at the energy source, are typically valves, circuit breakers, etc. Isolation devices should have a means of being locked in position

Lockout Device

A device that uses a positive physical means such as a lock, either key or combination type to maintain an energy isolation device in the safe position and prevent the in advertent energization of machinery, equipment, or systems. Device locks should serve no other purpose other than hazardous energy control isolation

Lockout Tag out Request Permit

A pre numbered form used to request that machinery, equipment or systems be taken out of service. A Lockout/Tagout Request Permit may be initiated by any one requiring energy isolation for work activities or for taking faulty equipment out of service

Lockout / Tag out Request Log

A record of all Lockout /Tag out Request Permits shall be maintained by the Lockout /Tag out Coordinator.

PROCEDURE

1. REQUESTING A LOCKOUT / TAGOUT PERMIT

When machinery, equipment, or systems are partially or completely taken out of service for work activities or equipment protection, a lockout / tag out shall be requested. The requestor shall be familiar with scope of work required and shall provide a brief description of the work on the Lockout / Tag out Request Permit. The requestor shall also provide the proposed start time and estimated duration of lockout / tag out. If familiar with

the machinery, equipment, or system to be taken out of service, the requestor may identify the devices that are required to be isolated. The LOTO Request Permit shall be forwarded to the Authorized Lockout / Tag out Coordinator for reviewed and signature, along with Permit to Work number to be entered on the LOTO Request Permit.

- The Lockout / Tag out Coordinator shall record the necessary information on the Lockout / Tag out Request Log and forward the request to the Engineer in Charge for approval.
- The Safety Manager or Engineer in Charge shall review the Lockout / Tagout Request Permit for impact on project operations. Project operations could be impacted by the equipment being taken out of service or by the required isolation to take the equipment out of service. If project operations are impacted by the Lockout / Tagout, the request shall be forwarded to the Engineer in Charge for approval.

  The Engineer in Charge shall provide the lockout / tag out isolation points necessary to perform the task stated on the request. The device identification, device location, device position, and locking mechanism shall be entered into the appropriate blocks on the Lockout / Tag out Request Permit.

- The Engineer in Charge indicates approval of the Lockout / Tagout Request Permit by signing in the appropriate space on the request. If the Lockout /Tag out Request Permit is rejected, the Engineer in Charge shall return it to the requestor, via the Lockout / Tagout Coordinator with a written explanation of the rejection.
- Once approved, the Lockout / Tag out Request Permit shall be forwarded to the Lockout / Tag out Coordinator to assign tags and locks.
- The log shall show current status of all Lockout / Tag out Request Permits from submittal to approval, through lifting of locks and tags to final closeout. The log shall be maintained by the Lockout / Tag out Coordinator in their office.

2. PLACEMENT OF LOCKS AND TAGS

- The tags shall be filled out to match the information on the LOTO Request Permit. Appropriate locks for the types of isolation devices specified shall be collected and placed with the tags and the Lockout / Tag out Request Permit.
- The isolator(s) shall take the device locks, tags, and the Lockout / Tagout Request Permit to position the specified isolation devices, sign and hang the tags, and place the locks. If the isolator does not agree with or understand the Lockout / Tagout Request Permit, or has a problem performing the isolation, the problem should be brought to the attention of the Safety Representative or Area Supervisor immediately and the lockout / tag out should be postponed until the situation is resolved.
- Once the Isolator has placed all “locks” on isolation points, they will “test ”and “try” the machinery, equipment, or system to ensure all hazardous energy has been completely removed and the isolation is one totally accomplished, and has initialed and signed the Lockout /Tag out Request Permit indicating all isolation points have been confirmed.
  - Examples of “lock”, “test” and “try”; by checking that all locks on the LOTO Request Permit have been applied and are in the specified position open/closed, on/off, etc.; metering test of electrical circuits, opening of drain valves, checking pressure gauges or indicators; and try by pushing start buttons and on/off switches, etc.

- Testing shall be performed by person(s) knowledgeable of the energy source(s) being isolated (e.g., an electrician should meter electrical circuits).

- A copy of the completed Lockout /Tag out Request Permit shall remain with the Work Package and used as part of the daily Pre-Job Briefings

3. WORKING UNDER A LOCKOUT / TAGOUT REQUEST

- Prior to starting the work activity, the person(s) performing the work shall review the Lockout / Tag out Request Permit and place the necessary tags and personal locks on the identified isolation devices. Personal locks may be placed only on devices that have already been locked and tagged in accordance with the Lockout / Tag out Request Permit.
  - All personal locks shall be accompanied by a tag that is signed and dated by the worker(s) and specifies the work activity being performed.
  - Personal locks should be of a different color than device locks for ready identification.

- Verification of the effectiveness of the isolation by the Isolator shall be performed for Worker's working under the lockout / tag out, by demonstrating the checks on "lock", "test" and "try",
- When the work activity is finished, personal locks and tags shall be removed and the Safety Representative shall be notified that the Lockout / Tagout is no longer required. If work under a lockout / tag out is to be delayed or interrupted for a period in excess of 24 hours, personal locks shall be removed until the work restarts. Personal locks shall be removed prior to the worker(s) leaving the project at the end of shift unless the key(s) are maintained at the project.

4. REMOVAL OF LOCKS AND TAGS

- When the lockout / tag out is no longer required, the Safety Representative or Area Supervisor shall obtain the Lockout / Tagout Request Permit from the work package for LOTO removal. Prior to removing locks or tags that may allow equipment to be energized, a check shall be made to verify that the equipment is free to safely operate (i.e., will not cause damage or injury). The locks and tags shall be removed and returned to the Lockout / Tagout Coordinator. Isolation devices may be repositioned at the discretion of the Engineer in Charge according to operational requirements. The Isolator shall complete the Lockout / Tagout Request Permit indicating each lock and tag has been removed and the Safety Representative or Area Supervisor forward to the Lockout / Tagout Coordinator.
- The Lockout / Tagout Coordinator shall discard the tags and maintain the completed Lockout / Tagout Request Permit for future reference.
- In the event that an employee leaves the job site without removing the personal lock I tag, the following measures shall be taken and documented. The measures listed below are a minimum set of guidelines and under all circumstances, refer to the site-specific safe work plan for detailed procedures:
  - Attempt calling / contacting the employee to return to the site for removal.
  - In the event an employee cannot be contacted, the Site Manager and Safety Manager shall sign an Emergency Lockout/Tagout Removal Form, (***see Attachment 5***), which has been completed by the Area Supervisor.
  - Employee shall be notified upon returning to the site, prior to beginning any work.

5. INTERRUPTION OF A LOCKOUT / TAGOUT

Operational Emergency

The Engineer in Charge / Safety Manager /Area Supervisor may deem it necessary to temporarily remove the locks and tags from isolation devices, prior to the end of the work activity. The standard procedure for removal of locks and tags shall be followed. Extreme caution shall be taken by the Isolator removing the locks and tags to prevent personnel injury.

Testing

When the performance of a work activity requires the functional testing of a machine, component, or system, the locks and tags may be temporarily removed in accordance with the tag removal, to perform the test. As a result of the testing, if it is determined that the equipment needs further work, the locks and tags shall be positioned back on to the device. If it is not necessary to replace all the locks and tags, then the unnecessary locks and tags may be returned to the Lockout / Tagout Coordinator. The Engineer in Charge shall initial the Lockout / Tag out Request Permit in the removal block to indicate that these locks and tags have been

removed. When testing has been satisfactorily completed, the locks and tags shall be removed.

ISOLATION DEVICES

- In most industrial applications, there are isolation devices that were not designed to accommodate a locking device. In these instances, an acceptable alternative that physically obstructs or prevents the use of the isolation device shall be found. Chains shall be placed on valves or electrical panels. Wires shall be determinate, pulled back, taped, and secured.
- If an isolation device does not accept a lock, a tag only is acceptable; however, all possible precautions shall be undertaken to provide a level of safety for the workers. The tag shall be readily visible to anyone attempting to operate the device.
    - If more than one Lockout / Tagout Request Permit requires that a single isolation device be locked and tagged, a lock and tag for each request shall be placed. Each lock in itself prevents the inadvertent operation of the device.

GROUP / COMPLEX LOCKOUT

In a multiple lockout / tag out procedure, each person working on the machinery or equipment must place a lock or tag on the energy isolating device. If the energy isolating device will not accept multiple locks or tags, a hasp (a multiple lockout device, may be used. The locks or tags must be placed in such a way that energy cannot be restored to the machinery or equipment until every lock or tag is removed. As each employee involved no longer needs to maintain lockout / tag out protection that employee removes his - her lock and/or tag. The employee attaching the lock or tag is the only person authorized to remove the lock or tag.

6. TRAINING

The training must include recognition of hazardous energy source, type and magnitude of energy available, methods and means necessary for energy isolation and control. Each authorized employee shall receive adequate training. The training should address that all affected employees are instructed in the purpose and

use of the energy control procedure. There should be training provisions included for any other employee whose work operations are or may be in an area where energy control procedures may be utilized. The employee training should also address when tag out systems are used including the limitations of a tag (tags are warning devices and do not provide physical restraint). The training should also include that a tag is not to be removed without authorization. The tag is never to be ignored or defeated in any way. Retraining is required when there is a change in job assignments, in machines, a change in the energy control procedures, or a new hazard is introduced. All training and I or retraining must be documented with employee's name and dates of training.

7. PROGRAM REVIEW

The lockout / tag out program must be reviewed at least annually. The review must ensure that procedures are being followed and that they are effective. A documented review of the inspection must include the date, the equipment, employees involved & the inspector. The inspector must be someone other than those actually using the lockout / tag out in progress.

ATTACHMENTS

#1. Danger (DO NOT OPERATE) Tags
#2. Device & Personal Locks and Multi Lock Hasp:
#3. Lockout / Tagout Request Permit
#4. Lockout / Tag out Request Log

Attachment 1, Danger (DO NOT OPERATE) Tags:

Attachment 2, Device & Personal Locks and Multi Lock Hasp:

Attachment 3, Lockout / Tag out Request Permit:

	LOCKOUT/TAGOUTREQUEST PERMIT		LOTO Request Permit No.:
			Work Permit No.:
Equip. Out of Service:	LOTO Date Required by: _____/_____/_____	Estimated Duration:	**LOTO Requested** Signed by: Date:
Scope of Work:			**LOTO Authorization** Signed by: Date:
			LOTO Removal Authorization Signed by: Date: Time:

Tag No.	Device to be Tagged / Locked I.D. No.	Device Location	Device Position *OPEN / CLOSED -ON/OFF*	Lock No.	Tag/Lock Placed by Print/Sign - Date/Time		Tag /Lock Removed by Print/Sign - Date/Time	

Comments Instructions:

Attachment 4: Lockout / Tag out Request Log

LOTO Permit No.	Requestor Name	Equipment & Location	Est. Work Completed Date	Approval Date	LOTO Placed Date	LOTO Removed Date	Comments

13.2.15 RISK ASSESSMENT

Risk and Hazard Analysis

In order to produce an overall Project EHS Plan, a project must be assessed for its risks. There are two components to the risk and hazard analysis. The procedure used to examine and plan for the identified risks and hazards is called a General Hazard and Risk Assessment.

JSA/HIRA review

Prior to commence the following activities Method statement and JSA/HIRA to be prepared by the concern engineer in coordination with EHS officer and submit to the client for review and approval. After getting approval the work will be started under PTW after clearance. For HIRA and criteria for the defining the high, medium & low risk the relevant annexure be referred. In case any deviations required in the approved method statement the concerned engineer/supervisor has to prepare additional HIRA/JSA to cover the new activities and associated risk. Following activities to be covered,

- Deep excavation (more than 5 feet)
- Significant concrete pouring (like heavy foundation, TG deck, Slab casting etc.)
- Confined entry
- Blasting
- Working on electrical/ energized equipment's
- Steel erection more than 5-Ton weight
- Working at height prior to completion of stairs/ladders/hand railing etc.

Definition:

HAZARD - Any potential or present danger to persons or property within the project site, e.g., oil on the floor is a hazard.

INCIDENT - An unintended happening that may result in injury, loss or damage, e.g., Slipping on the oil is an Incident.

INJURY – Physical harm, the result of an Incident, e.g., a sprained wrist from the fall would be an injury.

Hazard Analysis Document

- For high risk and dangerous work identified, the Applicant shall complete and submit a Hazard Analysis Document together with the PTW request. It will be a JSA (Job Safety Analysis) or Preliminary Hazard Analysis Checklist. And it shall be reviewed and approved by respective Construction and HSE Representatives.
- Issues such as work interface, coordination, drawings, toolbox meetings and work type/duration shall be detailed and included with supporting documentation for the Applicant's request for PTW.
- If applicable, Hazard Analysis Document shall be used as the foundation for development of Safe Work Method Statement. Each hazard identified shall be addressed in the Safe Work Method Statement and be submitted as part of the Applicant's submittal package.

Evaluation of Sub-contractor Risk Assessments includes

- Experience and expertise in performing similar type work.
- Duration of work performed
- Location of the work to be performed.

- Nature of the work to be performed.
- Potential for a subcontractor performing the work to expose themselves, other persons or employees, to hazards.
- Potential for exposure to work site hazards.

Review of Subcontractor specific issues

Preventive and protective measures must be introduced according to the following order of priority

- Eliminating the hazard by removing the activity from the work process. Examples include substitution with less hazardous chemicals, using different manufacturing processes, etc.
- Controlling the hazard at its source through use of engineering controls. Examples include local exhaust ventilation, isolation rooms, machine guarding, acoustic insulating, etc.
- Minimizing the hazard through design of safe work systems and administrative or institutional control measures. Examples include job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration, etc.
- Providing appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE.

13.2.16 HSE PREPAREDNESS FOR ADVERSE CLIMATES AND WEATHER

All Preventive and Precautionary measures to ensure Health & Safety of workers in all possible adverse weather conditions based on the analysis of the local area conditions to be taken by the subcontractor

13.2.16.1 SUMMER

1. The Working Time and Lunch Hour will be as per instruction of Statutory Authorities (no work between 11am to 3:30pm). However, in case temp comes down due to rain/cloudy weather work will continue as per normal routine.
2. During long lunch break, worker will be allowed to go back home for rest. Those who will like to stay back will avail at the facility of rest shed or other designed area.
3. They will be allowed to take small break during work as per their need.
4. Water sprinkling will be done on roads to reduce dust concentration.
5. Workers will be provided with adequate cool drinking water and Butter milk/Lemon water etc.
6. Adequate ORS stock will be made available at the work location in the First-Aid Box for use as needed and at First-aid Centre for emergency need.
7. Fire prevention shall be on high alert, with removal of dry grass and bushes, etc, inside and outside the surrounding work areas. No smoking, and control of open flame/sparks shall be maintained and monitored.
8. Worker will be informed about the Do's and Don'ts to be followed during summer in the Pre Job Brief.

Dos & Don'ts

1. Drink plenty of cool water and other non-alcoholic fluid and keep body well hydrated.
2. Eat salt in food to replenish loss of salt through sweating.
3. Avoid over physical exercise.
4. Have adequate sleep at night.
5. Eat light and less spicy food

6. Avoid eating food which was cooked long time ago.
7. Nobody should use small water bodies such as pits, running rain water through crevices etc. for drinking and cleaning purpose as it may be unhygienic.

Emergency Handling

In case of emergency due to heat disorder:

1. Rescue the victim from workplace and place under shed.
2. If to be rescued from height, use stoke basket or rescue kit.
3. Inform Ambulance immediately.
4. If nearby any air conditioned room/shed is available, place him inside the room/shed.
5. Administer First aid by trained First aider for Heat Disorder
6. If conscious, give him ORS solution to drink.
7. If required send the victim hospital immediately.

13.2.16.2 MONSOON

A. Height Work & Structural Safety:

1. Ensure that all height work platforms are barricaded and avoid any highly hazardous
2. Height work.
3. Ensure that all personnel have good quality and intact safety shoes
4. Stop all dangerous height work during rain
5. Explain Do's and Don'ts to workers during Tool Box Meetings
6. Ensure that there are no weak structures, boards etc. that can fall during high winds
7. Do not allow any loose material (e.g. GI sheet, Ply board, empty cement bag, aluminium foil, foam sheets etc.) on roof sheds or top of structures.
8. Do not permit any one to ride up or come down scaffolds frame work during heavy wind or rain.
9. Provide "anchor" of adequate strength to scaffolds and other high-rise structures.
10. All rest sheds and GI sheds will be anchored into the round and wall and roof panels will be secured with J hook to prevent shed from blowing over or parts/pieces becoming airborne. Proper earthing per IS standard is also to be installed.
11. Do not go alone nor permit anyone to stay at tower-tops, roof-tops, high structures or on electrical poles during the course of stormy weather or heavy rain.

B. Electrical:

1. All electrical connections / loads have to be routed through ELCB / RCCB (residual current circuit breaker) whose rating should be 30mA.
2. RCCB operational checks need to be done DAILY / WEEKLY during monsoon season.
3. Avoid joints on power cables which need to be laid over-head or under-ground, better not to have any joint at all. In case joints become essential, such cables must be housed rigidly and insulation must be provided as per approved standard. The joint shall be suitable for outdoor use.
4. All electrical distribution board shall be properly covered at top and sides to protect from rain water. Extension boards shall be protected from rain water.
5. Ensure proper "earthing" for each and every electrical appliance.
6. Double earthing need to be provided for 3-phase power supply and for voltage more than 220V.

7. Provide lightening arrestors at the top of Boiler 3 and boiler 4 and rest sheds which are not covered by existing lightening arrestor of other installation.

C. Others:

1. Maintain smooth flow on open drains. i.e. no obstruction or blockade shall be made on storm water drains. If required, make temporary drains.
2. Arrange back-filling of excavated pits on war-footing basis.
3. Arrange bringing down booms of all cranes, hydra machines during stormy weather (wind speed 40-50 km/hr)
4. Confirm that all gantry cranes are effectively choked to prevent rolling and toppling.
5. Do not forget to deep ready a dew battery operated lights at site-offices during rainy season.
6. Avoid using wet damp clothes.
7. Hard Barricade excavated zone filled with water with scaffolding pipe & clamp with reflective net
8. Engage diesel operated water pump to dewater work area. For electrically operated water pump, the starter shall be protected from rain water. All rotating parts shall be guarded. Ensure availability of sufficient water pumps.

D. Health and hygiene:

1. Monsoon reduces the immunity of our body and makes us vulnerable to many diseases which are commonly associated with this season. It is time for us to keep our body challenging against disease by boosting our immunity and taking safety measures against these diseases.
2. The diseases associated with monsoon are Malaria, Jaundice, Gastro-intestinal infections, like typhoid, cholera etc. apart from these viral infections like cold and cough also make their presence felt. Majority of above said diseases are on account of:
3. Puddle of water formed due to rain become breeding grounds for mosquitoes which spread disease like, malaria and dengue fever. As a precautionary measure against mosquito-bite disease one can use mosquito net around the end which is better choice to mosquito repellents like mats and coils.
4. Pollution of drinking water during monsoon is very common. It is very necessary to drink clean and pure water when water-borne monsoon diseases like diarrhoea and gastro-intestinal infections threaten us.
5. Walking in dirty water during rainy season leads of numerous fungal infection which affect toes and nails. Diabetic patients have to take a special care about their feet. Keeping feet always dry and clean is very necessary. Avoid walking in dirty water. Keep shoes socks and raincoats dry and clean.

E. Workmen will be made aware of following Do’s and Don’ts:

1. Do not sleep in daytime.
2. Avoid over physical exertion.
3. During lightning and thunder storm, do not take shelter under tree. Take shelter inside rest shed or store room.
4. Wash vegetables with clean water and steam them well to kill germs.
5. Avoid eating un-cooked foods and salads should be washed properly before consumption.
6. Drink plenty of water and keep body well-hydrated.
7. Always keep the surrounding area dry and clean. Don’t allow to get water accumulated around.

8. Keep body warm as viruses attack immediately when body temperature goes down.
9. Do not enter air conditioned room with wet hair and damp cloths.
10. Dry your feet and webs with soft dry cloth whenever they are wet.
11. Eat light and less spicy food.
12. Avoid eating food which was cooked long time ago.
13. Eat salt in food to replenish loss of salt through sweating.

13.2.16.3 EMERGENCY WEATHER CONDITIONS

Cyclone/Severe thunder storm

In the event of Cyclone/Severe thunder storm, alert will be issued by subcontractor on notification received by Govt. authorities/Metrological departments Customer or BHEL.

The actions required during cyclone/rough weather:

1. Check and advice subcontractors to clean-up work area. Pick up all loose and unused material of respective supervisor's area.
2. Tie to secure all gas cylinders to avoid displacement and unsafe conditions which could be due to wind pressure.
3. Secure portable electricity generating sets and other equipment, pumps, hoses etc.
4. Make preparation for removal of water logging.
5. Take review of work activity and make preparation for removal of equipment and material from vulnerable areas.
6. Isolate/turn off all electrical power form the main panel/switches. Secure and anchor panels properly.
7. Recheck anchorage/tie of all temporary structures/sheds, tall objects, cranes, rigs, scaffolds etc. to avoid toppling due to wind force.
8. Cranes boom shall be secured, either locked or lowered the booms as reasonably and practicably possible and rigs to safe position for the safety point of view.
9. Group up all trash barrels, wooden pallets, forms; wooden decks etc. and anchor properly.
10. Welding machines, air compressors and such equipment are to be grouped together and secured to the stable objects. Welding leads, electrical cables, hoses are to be rolled up and secured properly.
11. Set on site vehicles on high ground in the site area with brakes set firmly.
12. Anchor all tanks, vessels, gas cylinders that may be moved by high wind and water.
13. Evacuate job site.

Personnel Evacuation:

1. Personnel Evacuation will be required if predicted wind speed and storm surge heights are beyond acceptable limits as per the instructions from Govt. Authorities/ Metrological departments or Customer.
2. Once the warning is received for personnel evacuation, an emergency response team shall be formed. The team will work with local authorities and other agencies formed/deployed to evacuate and transport all personnel involved in the project to the cyclone shelter.
3. Cyclone may be followed by the calm "EYE", be aware of it. If the wind suddenly drops, don't assume the cyclone is over. Violent wind may resume from the opposite side direction. Wait for the official "All clear Signal".

4. After the cyclone, do not go outside until officially communicated about safe situation outside. Use recommended routes for returning. Do not panic or rush while returning.
5. Checking of gas leaks and well-being of electrical appliances is essential before leaving the site.
6. Follow local communications for official warning and advice. The construction Manager shall also obtain updates from customer/metrological departments and communicate to the personnel on project site.

13.2.17 PREVENTION OF COVID-19 AT PROJECT SITE & LABOUR COLONY:

BHEL OCP 61: Resumption of Construction Activities after Lock Down and Prevention of Coronavirus Infection during Site Operations and OCP 61A: Prevention of COVID-19 Infection in Labor Colony will be strictly followed.

A. <u>Preventive measures at project site:</u>

- BHEL and Agencies shall nominate COVID Marshalls, who will be responsible for monitoring the COVID prevention measures and apprising management on the same.
- Mandatory health check-up for every worker/ official joining the site
- All activities to be carried out using least amount of paperwork and physical proximity as far as possible.
- ***HSE Observer App*** to be used to monitor HSE Activities and follow up with agencies for closure of non-conformities.

<u>a. Strict Control at the Gate/ Banning Entry to Anyone Not Wearing Masks</u>

i. Security personnel at the gate may erect a barricade preferably approx. 10 meters from the gate and only allow personnel who are wearing proper masks inside.

ii. Public address system may be used to warn any non-compliant visitors

iii. Near entry gate, round markers at minimum 1-meter distance to be ensured so that distancing is ensured

iv. A hand-wash or hand sanitiser facility is preferable at the gate to allow entry after hand wash or hand sanitisation. These are also to be provided at key locations to enable hand wash / hand sanitisation before starting work, before eating, etc.

v. Gutkha, Paan, tobacco etc. to be banned from the site. Spitting to be strictly prohibited.

<u>b. Screening at Gate with Contactless Thermometer & Action on Suspected Cases</u>

i. Security Personnel at the Gate to screen each person entering the premises using a non-contact infrared thermometer, which is duly serial numbered and calibrated.

ii. In case any site worker/ official is found to have fever more than 99 Degrees Fahrenheit or found coughing/ sneezing, he/she may be advised rest till recovery and entry to be permitted after obtaining clearance from medical officer/assistance/attendants.

- Parcel to be collected from gate by concerned person preferably with provision of Special Box
- Any construction material received at site, unless properly sanitized, to be kept undisturbed for at least 3 days and to be used only after that period.
- During Toolbox Talks, minimum 1-meter distance between any two workers to be ensured

<u>c. During site execution activities:</u>

For all site execution activities, social distancing is to be maintained. In case this is not possible due to nature of work, speciality of work, etc, ensure sensitisation of the labour/staff involved and use of

appropriate PPEs, especially mandatory face mask. In any case, close working to be allowed only in special circumstances and ensuring these activities are preferably time staggered to the extent possible

d. In office premises:

i. Sharing of items like pens, water bottles etc. in office premises to be avoided
ii. Doors preferably to be in open condition to avoid contact
iii. All common touch points to be frequently disinfected in a day.

e. Regular disinfection of all Areas, Equipment and facilities

i. A dedicated disinfectant gang to be identified for the task by each agency. The disinfectant gang to be provided full body suits for the task.
ii. All areas (including office premises, site areas, chairs, tables, furniture etc.), tools & equipment to preferably be disinfected by dedicated gang every day before resumption of work.
iv. Common touch points like handrails, lift buttons, door/window knobs or handles, vehicle door handles, taps, conference room & dining hall tables/chairs, common sofas/chairs, visitor sofa/chairs, files & folders, etc to preferably be disinfected regularly at frequent intervals every day.
v. Pool vehicles, to be disinfected after every use. Social distancing to be maintained inside the common pool vehicles as per Govt./ statutory body guidelines.

f. Disinfecting the operator/driver touch points of Vehicles/cranes, T&Ps etc.

Disinfection to also be carried out for all Cranes, Vehicles, Equipment, consoles, T&Ps etc. which come into contact with operating personnel.

g. Posters on COVID-19

Sufficient Posters on COVID-19 to be ensured across the site in languages understood by most workers.

h. Brief guidelines for hand washing are as below:

i. Soap to be provided at each wash basin and replenished regularly.
ii. Washing with soap for at least 20 seconds is recommended.
iii. As a general guideline, for every 100 workers, 1 wash-basin may be provided at site areas.
iv. Close queue to be avoided near wash-basins and 1-meter distance to be maintained. Round markers at 1-meter distance can be ensured as guidance

Composition of Disinfectant:

i. Readily available 1% hypochlorite solution or 4%
ii. Liquid chlorine-1% solution
Iii. Surgical spirit-95% alcohol content

Hand sanitizer should have: Isopropyl alcohol-75%, Gycerol-1.45%, Hydrogen Peroxide-0.125%

B. Prevention of COVID-19 Infection in Labor Colony:

- Spacing of minimum 2 meters between living areas of workers inside a room may be maintained. Preferably, the living area of each worker may be partitioned using sheet of cloth, plastic etc.
- Rooms to be properly ventilated as far as possible
- Sanitation to be given prime importance and personal hygiene to be promoted
- Face masks shall be worn by everyone inside the colony premises

- Spitting of Pan. Gutkha etc. inside the colony and urinating etc. outside the toilets to be strictly avoided
- Regular visits by Doctors to the labor colony can be arranged on non-working day for check-up of all workers
- Identification of "COVID Wardens" (CWs) by each agency for maintaining the following:
  i. Keeping an eye on the health of workers and report any suspected cases of fever, coughing etc. to the management
  ii. Keeping an eye on the social distancing measures in the labor colony and report any non-conformances to the management.
  iii. Educate the workers about social distancing and COVID prevention measures.
- Training/ Awareness regarding COVID-19 to be provided to workers regularly.
- Workers to be instructed to maintain social distancing of minimum 1 m at all time
- Posters on COVID-19: Sufficient Posters on COVID-19 to be ensured across the labor colony in languages understood by most workers.
- All workers to be instructed to inform any suspected cases of illness (individual or others) to an emergency contact number of CW, the emergency contact numbers and CW contact numbers to be displayed at prominent locations
- Inspection & Review
  i. Daily Inspection by concerned COVID Wardens and reporting to Agency
  ii. Regular inspection by Agency & BHEL

13.2.18 Noise Mitigation

High noise is harmful to the human health and it can cause impairment if exposed for long duration at regular intervals, and also cause disruption in nearby communities.

- Noise monitoring shall be carried out in all construction locations periodically.
- Use of silent DG is allowed at site during construction.
- Low noise generation equipment's to be preferred.
- Work areas where noise levels exceed the 85db shall be posted as hearing protection required.
- Use of PPEs / ear plug/ear muff for personnel entering into high noise area.
- Activities generation High noise will be planned in day shift.

Noise Level Chart

Parameter	Night Noise level dBA	Daytime Noise Level dBA
At 1-meter from each piece of equipment	85	85
At Property boundary	70	70

13.3 ENVIRONMENTAL CONTROL

1. Environment protection has always been given prime importance by BHEL. Environmental damage is a major concern of the principal subcontractor and every effort shall be made, to have effective control measures in place to avoid pollution of Air, Water and Land and associated life.
2. Subcontractor shall list out all applicable environmental aspects and impacts, and ensure control measures to manage the same.
3. Chlorofluorocarbons such as carbon tetrachloride and trichloroethylene shall not be used.
4. Waste disposal shall be done in accordance with the guidelines laid down in the project specification.

5. Any chemical including solvents and paints, required for construction shall be stored in designated bonded areas around the site as per MSDS.
6. In the event of any spillage, the principle is to recover as much material as possible before it enters drainage system and to take all possible action to prevent spilled materials from running off the site. Subcontractor shall use appropriate MSDS for clean-up technique. Subcontractor shall be responsible for the cleanliness of their own areas.
7. Subcontractor shall ensure that noise levels generated by plant or machinery are as low as reasonably practicable. Where the subcontractor anticipates the generation of excessive noise levels from his operations the subcontractor shall inform BHEL accordingly so that reasonable & practicable precautions can be taken to protect other persons who may be affected.
8. It is imperative on the part of the subcontractor to join and effectively contribute to environmental protection measures such as tree plantation and towards social causes and maintaining good relations with local populace.
9. The subcontractor shall carry out periodic air and water quality check and illumination level checking in respective area of work place and take suitable control measure to maintain the same as per applicable laws / standards

13.3.1 WASTE MANAGEMENT

1. Subcontractor shall take suitable measures for waste management and fulfilling requirements of environment related laws/legislation as a part of normal construction activities.
2. Compliance with the legal requirements on storage/ disposal of paint drums (including the empty ones), Lubricant containers, Chemical Containers, and transportation and storage of hazardous chemicals will be strictly maintained.
3. Details of E-Waste, Hazardous Waste, shall be submitted to BHEL as per Format No. HSEP: 13-F19 and HSEP: 13-F20 respectively

13.3.1.1 BINS AT WORK PLACE

1. Sufficient rubbish bins shall be provided close to workplaces.
2. Bins should be painted yellow and numbered.
3. Sufficient nos. of drip trays shall be provided to collect oil and grease.
4. Sufficient qty. of broomsticks with handle shall be provided.
5. Adequate strength of employees should be deployed to ensure daily monitoring and service for waste management.

13.3.1.2 STORAGE AND COLLECTION

1. Different types of rubbish/waste should be collected and stored separately.
2. Paper, oily rags, smoking material, flammable, metal pieces should be collected in separate bins with close fitting lids.
3. Rubbish should not be left or allowed to accumulate on construction and other work places.
4. Do not burn construction rubbish near working site.

13.3.1.3 SEGREGATION

1. Earmark the scrap area for different types of waste.

2. Store wastes away from building.
3. Oil spill absorbed by non-combustible absorbent should be kept in separate bin.
4. Clinical and first aid waste stored and incinerated separately.

13.3.1.4 DISPOSAL

1. Sufficient containers and scrap disposal area should be allocated.
2. All scrap bin and containers should be conveniently located.
3. Provide self-closing containers for flammable/spontaneously combustible material.
4. Keep drainage channels free from choking.
5. Make schedule for collection and disposal of waste.

13.3.1.5 WARNING AND SIGNS

1. Appropriate signage to be displayed at scrap storage area
2. No toxic, corrosive or flammable substance to be discarded into public sewage system.
3. Waste disposal shall be in accordance with best practice.
4. Comply with all the requirements of Pollution Control Board (PCB) for storage and disposal of hazardous waste.

13.4 HOUSEKEEPING

1. Keeping the work area clean/ free from debris, removing unused scaffoldings, scraps, insulation/ sheeting wastage /cut-pieces temporary structures, packing woods etc. will be in the scope of the subcontractor.
2. Such cleaning has to be done by subcontractor within quoted rate, on daily basis by dedicated identified groups equipped with all require PPEs and training. The details of housekeeping group shall be provided to BHEL.
3. If such activity is not carried out by subcontractor / BHEL is not satisfied, then BHEL may get it done by other agency and actual cost along with BHEL overheads will be deducted from subcontractor's bill. Such decisions of BHEL shall be binding on the subcontractor.
4. Pests, such as beehives etc. shall be periodically removed in a humane fashion
5. Materials stacking and storage will be done in proper way and its height should not be more than 2 Mtr. from approach level.
6. **Following are to be taken care of on daily basis.**

i. All surplus earth and debris are removed/disposed of from the working areas to identified locations.
ii. Unused/Surplus cables, steel items and steel scrap lying scattered at different places /elevation within the working areas are removed to identify locations.
iii. All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from workplace to identified locations. Sufficient waste bins shall be provided at different work places for easy collection of scrap/waste. Scrap chute shall be installed to remove scrap from high locations
iv. Access and egress (stair case, gangways, ladders etc.) path should be free from all scrap and other hindrances.
v. Workmen shall be educated through tool box talk about the importance of housekeeping and encourage not to litter.
vi. Labor camp area shall be kept clear and materials like pipes, steel, sand, concrete, chips and bricks, etc.

shall not be allowed in the camp to obstruct free movement of men and machineries.

vii. Fabricated steel structures, pipes & piping materials shall be stacked properly.

viii. No parking of trucks/trolleys, cranes and trailers etc. shall be allowed in the camp, which may obstruct the traffic movement as well as below LT/HT power line.

ix. Utmost care shall be taken to ensure over all cleanliness and proper upkeep of the working areas

13.5 TRAFFIC MANAGEMENT

13.5.1 SAFE WORKPLACE TRANSPORT SYSTEM

1. Traffic routes in a work place shall be suitable for the persons or vehicles using them.
2. Traffic routes for pedestrians and vehicles shall be clearly demarcated and indicated
3. Traffic routes shall never intersect the area of work and shall not endanger the site personnel
4. For internal traffic, lines marked on roads / access routes and between buildings shall clearly indicate where vehicles are to pass.
5. Temporary obstacles shall be brought to the attention of drivers by warning signs / hazard cones.
6. Power cables shall be maintained at a minimum height above ground as specified in Indian Electricity Act & Rules.
7. Sensible speed limits shall set and clearly displayed. Painted Speed ramps preceded by a warning signs or marker are necessary for stretches of roads exceeding 50 meters.
8. The traffic route should be wide enough to allow vehicles to pass and re-pass oncoming or parked traffic and it may be advisable to introduce on-way system or parking restrictions.
9. Safest route shall be provided between places where vehicles have to call or deliver.
10. Avoid vulnerable areas/items such as fuel or chemicals tanks or pipes, open or unprotected edges and structures likely to collapse
11. Safe areas shall be provided for loading and unloading of material. Loading / Unloading Permit shall be taken from BHEL prior to any significant loading / unloading activity
12. Avoid sharp or blind bends. If this is not possible hazards should be indicated e.g. blind corner.
13. Ensure road crossings are minimum and clearly signed.
14. Entrance and gateways shall be wide enough to accommodate a second vehicle without causing obstruction.
15. Forklift trucks shall not pass over road hump unless of a type capable of doing so.
16. Overhead electric cable, pipes containing flammable hazardous chemical shall be shielded by using goal posts height gauge posts or barriers.
17. The height of Power cables above areas of movement shall conform to Indian Electricity Rules
18. Road traffic signs shall be provided on prominent locations for prevention of accidents and hazards and for quick guidance and warning to employees and public.
19. Safety signs shall be displayed as per the project working requirement and guideline of the state in which project is done.
20. Vehicles hired or used shall not be parked within the 15m radius of any working area. Any vehicle, that is required to be at the immediate/near the vicinity, shall be approved by the person in-charge of the site.

13.5.2 TRAFFIC ROUTE FOR PEDESTRIANS

1. Where traffic routes are used by both pedestrians and vehicles road shall be wide enough to allow vehicles and pedestrians safely.

2. Separate routes shall be provided for pedestrians to keep them away from vehicles. Provide suitable barriers/guard at entrances/exit and the corners or buildings.
3. Where pedestrian and vehicle routes cross, appropriate crossing shall be provided.
4. Where crowd is likely to use roadway e.g. at the end of shift, stop vehicles from using them at such times.
5. Provide high visibility clothing for people permitted in delivery area.

13.5.3 WORK VEHICLES

Work vehicles shall be as safe, stable, efficient and roadworthy as private vehicles on public roads. Subcontractors shall ensure that drivers are suitably trained and have valid license and experience for the designated class of vehicle. All vehicle e.g. heavy motor vehicle forklift trucks dump trucks mobile cranes shall ensure that the work equipment conforms to the following:

1. A high level of stability.
2. A safe means of access/egress.
3. Suitable and effective service and parking brakes.
4. Windscreens with wipers and external mirrors giving optimum all round visibility.
5. Provision of horn, vehicle lights, reflectors, reversing lights, automatic reverse camera & reverse horn connected to reverse gear.
6. Provision of seat belts.
7. Guards on dangerous parts.
8. Driver protection - to prevent injury from overturning and from falling objects/materials.
9. Driver protection from adverse weather.
10. No vehicle shall be parked below HT/LT power lines in conformance to Indian Electricity Act & Rules.
11. Valid Pollution Under Control certification for all vehicles

13.5.4 DAILY CHECKS BY DRIVER

There should also be daily safety checks containing below mentioned points by the driver before the vehicle is used. Subcontractors should ensure that drivers carry out these checks as a minimum.

Brakes	Mirrors	Warning signals
Tires	Windscreen waters	Specific safety system i.e. control interlocks
Steering	Wipers	Back Camera

13.5.5 TRANSPORTATION OF PERSONNEL AND MATERIALS BY VEHICLES

1. All drivers shall hold a valid driving License for the class of vehicle to be driven and be registered as an authorized BHEL driver with the Administration Department.
2. Securing of the load shall be by established and approved methods, i.e. chains with patented tightening equipment for steel/heavy loads. Sharp corners on loads shall be avoided when employing ropes for securing.
3. All overhangs shall be made clearly visible and restricted to acceptable limits
4. Load shall be checked before moving off and after traveling a suitable distance.
5. On no account is construction site to be blocked by parked vehicles Drivers of vehicles shall only stop or park in the areas designate by the stringing foreman.
6. Warning signs shall be displayed during transportation of material.

7. All vehicles used by Subcontractor shall be in worthy condition and in conformance to the Land Transport requirement
8. All vehicles shall have automatic reverse camera and reverse horn connected with reverse gear.
9. Speed limit for passenger vehicles is 20 Km/ Hr. within plant premises.

13.5.6 MAINTENANCE

All Vehicles used for transportation of man and material shall undergo scheduled inspections on frequent intervals to secure safe operation. Such inspections shall be conducted in particular for steering, brakes, lights, horn, doors etc. Site management shall ensure that work equipment is maintained in an efficient, working order and in good repair. Inspections and services carried out at regular intervals of time and or mileage. No maintenance shall be carried below HT/LT power lines.

13.6 EMERGENCY PREPAREDNESS AND RESPONSE

1. Subcontractor shall develop Emergency preparedness and response capability and Emergency Response Team as per HSEP06: HSE Procedure for Emergency Preparedness and Response
2. Availability of adequate number of first aiders and fire warden shall be ensured
3. All the subcontractor's supervisory personnel and sufficient number of workers shall be trained for fire protection systems. Enough number of such trained personnel must be available during the tenure of contract. Subcontractor should nominate his supervisor to coordinate and implement the safety measures and communicate the same to BHEL.
4. Assembly point shall be earmarked and access to the same from different location shall be shown
5. Fire exit shall be identified and pathway shall be clear for emergency escape.
6. Appropriate type and number of fire extinguisher shall be deployed as per Clause No. 13.2.7 and validity shall be ensured periodically through inspection
7. Adequate number of first aid boxes shall be strategically placed at different work places to cater to all emergency needs. Holder of the first aid box shall be identified on the box itself who will have the responsibility to maintain the same.
8. First aid center shall be developed at site with trained medical personnel and ambulance
9. Emergency contact numbers of the site shall be displayed at prominent locations.
10. Tie up with fire brigade shall be done in case customer is not having fire station.
11. Tie up with hospital shall be ensured in order to ensure the availability of following services to victims quickly without wasting precious time:
    a. Intensive Care Unit with Ventilator and other necessary life support systems
    b. Facility of specialized Orthopedic Surgery – in case of fracture / amputation
    c. Facility of specialized brain / neuro surgery – in case of head trauma
    d. Facility of specialized burn unit / ward – in case of Fire / burn injury
    e. and other facilities as per requirement at site location

    In case tie up with multiple hospitals is required to cover all possible accidents, same shall be done. The list of facilities to be regularly checked and updated.
12. A detailed emergency services (Fire / Medical etc.) tie up plan shall be submitted to BHEL in monthly HSE planning & review Format No. HSEP:13-F30
13. Mock drill shall be conducted on different emergencies periodically to find out gaps in emergency preparedness and taking necessary corrective action

13.6.1 RESCUE PLAN:

PURPOSE

The purpose of this rescue template is to establish guidelines for responding to falls from height. This rescue plan is intended to reduce risks to an employee's health after a fall arrest event. The rescue plan should also minimize the amount of at-risk behavior of the rescuer during the rescue attempt, and help to ensure that the rescue is conducted promptly in a safe and professional manner.

APPLICATION

1. This rescue plan applies to all locations where personnel are employed to work at height. The requirements of this rescue plan must be observed by all personnel involved in working at heights.
2. This rescue plan must be considered in any job safety analysis or pre- task planning for activities that require working at heights.

RESPONSIBILITIES

EMPLOYEES:

- Must be familiar with the Fall Protection Program.
- Must understand and be able to evaluate the risks associated with working at heights. Must be trained and competent in the use of fall protection equipment prior to conducting work at heights.
- Must report unsafe conditions or behaviors to the Person-In-Charge.
- Must be familiar with and understand the company's rescue plan to provide assistance in prompt rescue in the event of an arrested fall event.

AUTHORIZED RESCUER:

- Must be trained by a competent rescuer trainer before being exposed to a fall hazard or potential rescue application.
- Must be re-trained when the nature of the work, workplace, or methods of control or rescue change to an extent that prior training is no longer adequate.
- Must be trained on how to inspect, anchor, assemble and use the fall protection and rescue equipment used in locations where employees work. Training must include physical demonstrations by trainees.
- Training must include at least the following:
    - Fall hazard recognition;
    - Fall hazard elimination and control methods;
    - How to use written fall protection and rescue procedures;
    - Inspection of equipment components and systems before use.
- Refresher training must occur at least every two years for the authorized rescuer to stay current with fall protection and rescue educational requirements.
- Must be evaluated by a competent rescuer or competent rescuer trainer at least annually to ensure competency of the duties assigned. This evaluation must include both an examination and a physical demonstration of usage of all equipment the person is authorized to operate.
- Mock rescue drills of work at height scenarios shall be conducted periodically (3 times per year to ensure skills and response quality is maintained.

14 HSE INSPECTION

Inspection on HSE for different activities being carried out at site shall be done to ensure compliance to HSEMS requirements. The subcontractor shall maintain necessary safety equipment as applicable, to enable inspection personnel/agency perform Inspection. If any test equipment is found not complying with proper safety requirements then the Inspection Agency may withhold inspection, till such time the desired safety requirements are met.

The requirements of respective work permits are to be ensured by respective supervisors, safety personnel and area in-charges. In addition, the formats & checklists as per Clause 21 of this document provided by BHEL shall be used for inspection by Safety personnel (as a minimum), and records of inspection to be maintained. BHEL shall reserve the right to modify any Format in this document or introduce additional checklists / formats to ensure regular inspection of all equipment as per requirement.

14.1 DAILY HSE CHECKS

Both the Site Supervisors and HSE Supervisors are to conduct daily site Safety inspection around work activities and premises to ensure that work methods and the sites are maintained to an acceptable standard. The following are to form the common subjects of a daily safety inspection:

1. **Height Work:**
   a. Safe, barricaded platform
   b. PPEs
   c. Proper method
   d. Awareness
2. Personal Safety wears & gear compliance.
3. Complying with site safety rules and permit-to-work (PTW).
4. Positions and postures of workers.
5. Use of tools and equipment etc. by the workers.
6. The inspection shall be carried out just when work starts in beginning of the day, during peak activities period of the day and just before the day's work ends.

14.2 INSPECTION OF HEIGHT WORKING

1. Any kind of height work (above 2 meters) shall not be carried out without active physical supervision by concerned supervisor or safety personnel. All non-conformances related to height work shall be handled on priority and closed immediately after halting the work.
2. A roster of personnel deployed for inspection of height work and other critical activities shall be prepared and submitted to BHEL in monthly report Format No. HSEP:13-F05, in order to ensure effective supervision at all times
3. Inspection on height working shall be conducted **daily** by supervisors before start of work to ensure safe working condition including provision of:

a. Fall arrestor b. Lifelines c. Safety nets	d. Fencing and barricading e. Warning signage f. Covering of opening	g. Proper scaffolding with valid Tags, access and egress. h. Illumination

4. Inspection on height working shall be conducted once in a week by HSE officer as per Format no. HSEP: 13-F10.
5. Medical fitness, including vertigo test of height worker shall be ensured.
6. Height working shall not be allowed during adverse weather.

14.3 INSPECTION OF PPE

PPEs shall be inspected by HSE officer at random once in a week as per Format no. HSEP: 13-F06 for compliance to standard and provisions and any adverse observation shall be recorded in the PPE register.

14.4 INSPECTION OF T&Ps

1. All T& Ps being used at site shall be inspected by HSE officer once in a month as per specific Formats in this document, or (if not available) general Format no. HSEP: 13-F07 for its healthiness and maintenance.
2. A master list of T&Ps and validity of their inspection certificates shall be maintained by each agency and details shall be submitted to BHEL in monthly format no. HSEP:13-F05.
3. The T&Ps which require third party inspection shall be checked for its validity during inspection. The third-party test certificate should be accompanied with a copy of the concerned competent person's valid qualification record. BHEL shall be given advance intimation of Third-Party Inspection. BHEL shall associate with Inspection as per discretion.

14.5 INSPECTION OF CRANES AND WINCHES

1. Cranes and winches shall be inspected by the operator through a daily checklist for its safe condition (as provided by the equipment manufacturer) before first use of the day.
2. Cranes and Winches shall be inspected by HSE officer once in a month as per Format no. HSEP: 13-F09A & F09B for healthiness, maintenance and validity of third-party inspection.
3. The date of third-party inspection and next due date shall be painted on cranes and winches.
4. The operators/drivers shall be authorized by sub-contractor based on their competency and experience and shall carry the I-card.
5. The operator should be above 18 years of age and should be in possession of driving license of HMV man & goods), vision test certificate and should have minimum qualification so that he can read the instructions and check list.

14.6 INSPECTION ON WELDING AND GAS CUTTING OPERATION

1. Supervisor shall ensure that no flammable items are available in near vicinity during welding and gas cutting activity.
2. Gas cylinders shall be kept upright.
3. Use of Flash back arrestor shall be ensured at both ends.
4. Inspection during welding and gas cutting operations shall be carried out by HSE officer once a month as per Format no. HSEP: 13-F11.
5. Use of fire blanket to be ensured to avoid falling of splatters during welding or gas cutting operation at height.
6. Availability of fire extinguisher in vicinity shall be ensured.

14.7 INSPECTION ON ELECTRICAL INSTALLATION / APPLIANCES

1. Ensure proper earthing in electrical installation
2. Use of ELCB at electrical booth
3. Electrical installation shall be properly covered at top where required
4. Use appropriate PPEs while working
5. Use portable electrical light < 24 V in confined space and potentially wet area.
6. Monthly inspection shall be carried out as per Format no. HSEP: 13-F12.

14.8 INSPECTION OF ELEVATOR

1. Elevators shall be inspected by concerned supervisors once in a week as per Format no. HSEP: 13-F13.
2. All elevators shall be inspected by competent person and validity shall be ensured.
3. The date of third-party inspection and next due date shall be painted on elevator.

14.9 MONTHLY SITE INSPECTION

Subcontractor shall carry out monthly HSE inspection of all work areas as per Format No. HSEP: 13-F21 and submit to BHEL

14.10 NON-CONFORMITY HANDLING

Any serious non-conformances identified during inspection observed shall be addressed immediately.
In case immediate closure of non-conformities is not possible:

a. work to be halted in the area
b. Non-conformance to be generated and submitted to responsible person and BHEL
c. non-conformance to be resolved through responsible agency / person

Only after closure of serious non-conformances, work to be allowed to resume.

All non-conformances & safety violations to be recorded and closed in a time bound manner.

15 HSE PERFORMANCE

HSE performance of subcontractor shall be monitored as per BHEL criteria, based on which, marks will be awarded. Marks can be used to evaluate and rate the contractor as per BHEL internal systems. Format for vendor HSE performance evaluation is attached in annexure **(Format No. HSEP: 13-F33)**

Subcontractor shall make available all data required for evaluation to BHEL as and when demanded.

1. If safety record of the subcontractor in execution of the awarded job is to the satisfaction of safety department of BHEL, issue of an appropriate certificate to recognize the safety performance of the subcontractor may be considered by BHEL after completion of the job.
2. 1.5% of running bill shall be cleared subject to certification of desired safety performance by BHEL Periodicity of HSE Performance Review: Monthly

16 HSE PENALTIES FOR NON-COMPLIANCE

1. Nonconformity of safety rules and safety appliances will be viewed seriously and BHEL has right to impose fines on the subcontractor for every instance of violation noticed.
2. The applicable penalties for HSE violations are given in Format No. HSEP13-F14 of this document
3. The list of non-compliances given in above format is not exhaustive. The BHEL site in-charge has liberty to impose a penalty for any other non-compliance and incidents of any nature.
4. If principal customer or statutory and regulatory bodies impose penalty on ground of statutory non-compliance or non-compliance of HSE rules by the subcontractor or any incident of any nature including fatality or permanent disability, the same shall be passed on to the subcontractor with appropriate overhead
5. The penalty amount shall be recovered from subcontractors from the RA Bill, otherwise Final bill.

17 COMPENSATION TO ACCIDENT VICTIMS

1. BHEL shall recover the amount of compensation paid to victim(s) by BHEL towards loss of life / permanent disability due to an accident which is attributable to the negligence of contractor, agency or firm or any of its employees as detailed below.

a. **Victim**: Any person who suffers permanent disablement or dies in an accident as defined below.

b. **Accident:** Any death or permanent disability resulting solely and directly from any unintended and unforeseen injurious occurrence caused during the manufacturing/ operation and works incidental thereto at BHEL factories/ offices and precincts thereof, project execution, erection and commissioning, services, repairs and maintenance, trouble shooting, serving, overhaul, renovation and retrofitting, trial operation, performance guarantee testing undertaken by the company or during any works / during working at BHEL Units/ Offices/ townships and premises! Project Sites.

c. Compensation in respect of each of the victims:

i. In the event of death or permanent disability resulting from Loss of both limbs: Rs. 10,00,000/- (Rs. Ten Lakh)

ii. In the event of other permanent disability: Rs. 7,00,000/- (Rs. Seven Lakh)

d. **Permanent Disability**: A disablement that is classified as a permanent total disablement under the proviso to Section 2 (l) of the Employee's Compensation Act, 1923. "

2. In addition to above, contractor shall provide appropriate compensation to victims of major and fatal incidents as per Employee Compensation Act, 1923, ESIC Act, 1948 or as per any existing Acts and guidelines.
3. Penalty, as per BHEL rate, will be imposed in addition to the above.

18 INTERNAL & EXTERNAL HSE AUDITS

1. Subcontractor shall extend full co-operation and maintain necessary documents & records as required by Internal & External HSE Audit carried out by BHEL. / Third Party
2. All non-conformities and observations on HSE shall be disposed of by subcontractor in a time bound manner as detailed in Audit Report.
3. All required corrective actions shall be taken by the subcontractor in order to avoid recurrence

19 OTHER REQUIREMENTS

1. In case of any delay in completion of a job due to mishaps attributable to lapses by the subcontractor, BHEL shall have the right to recover cost of such delay from the payments due to the subcontractor, after holding an appropriate enquiry and notifying the subcontractor suitably.
2. **RISK & COST:**
   If the subcontractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given reasonable opportunity to do so and/or if the subcontractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instruction regarding safety as per contractual requirements, BHEL shall have the right to take corrective steps at the risk and cost of the subcontractor after giving a notice of not less than 7 days indicating the steps that would be taken by BHEL.
3. If the subcontractor succeeds in carrying out its job in time without any fatal or disabling injury incident and without any damage to property BHEL may, at its sole discretion, favourably consider to reward the subcontractor suitably for the performance.
4. The subcontractor shall take all measures at all the sites of work to protect all persons from incidents and shall be bound to bear the expenses of every suit, action or other proceeding of law that may be brought by any persons for injury sustained, death or damage to environment owing to neglect of the HSE precautions by the subcontractor; and shall be liable to pay any such persons such compensation, should such claim proceeding be filed against BHEL.
   The subcontractor hereby agrees to indemnify BHEL against the same.

20 HSE REVIEW

BHEL shall hold HSE review meeting every month or as per requirement in order to discuss and resolve HSE issues of site and improve HSE performance. It will also discuss the incidents occurred since previous meeting, its root cause and Corrective action. The indicative agenda is given below:

1. Implementation of earlier MOM
2. HSE performance review
3. HSE inspection review w.r.t non-conformances observed and their status
4. HSE audit and CAPA
5. HSE training conducted and requirement
6. Health check-up camp
7. HSE planning for the erection and commissioning and installation activities in the coming month
8. HSE reward and promotional activities
9. HSE data analysis and improvement – Data analyzed will include non-conformances closed and pending, incident data, training data etc.

Subcontractor shall ensure presence of site in-charge, all package in-charges and safety officers, as communicated by BHEL in the meeting.
Subcontractor shall take requisite actions as per record notes and as decided in the meeting, in a time bound manner and submit compliance report to BHEL.

21 FORMATS USED

This is minimum list of Formats to be used for reporting by the subcontractor. Other Formats are indicated in respective HSE Procedures, Work Permits and OCPs or as specified by BHEL. The medium of reporting can be hard / soft as indicated by BHEL.

BHEL can modify these Formats or introduce new Formats to the extent necessary to get the desired performance data of all HSE activities.

SN	Format Name	Format No.	Frequency of check	Rev
1	General Work Permit	HSEP:12-FP01	Before start of work and regularly thereafter as per Permit conditions	00
2	Work at Height Permit	HSEP:12-FP02		00
3	Hot Work Permit	HSEP:12-FP03		00
4	Confined Space Work Permit	HSEP:12-FP04		00
5	Excavation Work Permit	HSEP:12-FP05		00
6	Radiation Work Permit	HSEP:12-FP06		00
7	Critical Lifting Activity Work Permit	HSEP:12-FP07		00
8	Night Work Permit	HSEP:12-FP08		00
9	Loading/ Unloading Work Permit	HSEP:12-FP09		00
10	Grating/ Safety net removal Work Permit	HSEP:12-FP10		00
11	Lock out-Tag out Work Permit	HSEP:12-FP11		00
12	Beam/ Truss/ Duct/ Structure Alignment Work Permit	HSEP:12-FP12		00
13	Inspection of First Aid Box	HSEP:13-FP01	Weekly	00
14	Health Check Up	HSEP:13-F02	With new Induction & as per requirement thereafter	00
15	HSE Induction / Regular / On-the-Job Training	HSEP:13-F03		00
16	Tool Box Talk	HSEP:13-F04	Daily before job start	00
17	Site HSE Report	HSEP:13-F05	Monthly	00
18	PPE Inspection	HSEP:13-F06	Weekly	00
19	Inspection of T&Ps	HSEP:13-F07	Monthly / As per requirement	00
20	Status of T&Ps	HSEP:13-F08	Monthly / As per requirement	00
21	Inspection of Cranes	HSEP:13-F09A	Monthly / As per requirement	
22	Inspection of Winches	HSEP:13-F09B	Monthly / As per requirement	00
23	Inspection of Height Working	HSEP:13-F10	Daily / As per requirement	00
24	Inspection on Welding & Gas Cutting	HSEP:13-F11	Weekly / As per requirement	00
25	Inspection on Electrical Installation	HSEP:13-F12	Weekly / As per requirement	00
26	Inspection on Elevator	HSEP:13-F13	Weekly / As per requirement	00
27	HSE Penalty	HSEP:14-F14	-	00
28	Initial Verification of PPE's & Lifting Tools & Tackles	HSEP:13-F15	As and when new PPEs and T&Ps are received	00
29	Inspection of Labor Colony	HSEP:13-F16	Monthly / as per requirement	00
30	Recording of First Aid Injuries	HSEP:13-F17	As and when such injuries occur	00
31	Register of Issue and Receipt of PPEs	HSEP:13-F18	With new Induction	00
32	E Waste Records at the facility	HSEP:13-F19	Half Yearly	

SN	Format Name	Format No.	Frequency of check	Rev
33	Hazardous Waste at the facility	HSEP:13-F20	Half Yearly	00
34	HSE Checklist-cum-Compliance Report	HSEP:13-F21	As per Audit Calendar	00
35	Monthly HSE Planning & Review	HSEP:13-F30	Monthly	00
36	Daily HSE Report (Agency)	HSEP:13-F31A	Daily	00
37	Method Statement Format	HSEP:13-F32A	Before starting critical activity	00
38	Job Safety Analysis	HSEP:13-F32B	Before starting new job	00
39	Evaluation of HSE Performance	HSEP:13-F33	Monthly	00
40	Initial Incident Report (Near Miss/ Minor incident)	HSEP: 08-F01	Within 24 hours of incident occurrence	00
41	Preliminary Incident Report to HQ (Fatal/ Major/ Fire)	HSEP: 08-F02		00

HSEP:12-F01

GENERAL WORK PERMIT	Permit No. & Date
Project & Unit:	**Emergency Contact Nos:**
BHEL Sub-contractor:	

Exact Location of Work:_____

Nature / Description of Work:_____

_____

Duration of Work Execution *: From Date:_____to Date:_____Daily from _____ hrs. to _____hrs.

Name of Sub-Contractor Performing the Work: _____

Name of Sub-Contractor's Site Engineer (Permit Requesting Authority):_____Sign:_____
Name of Sub-Contractor's Package In-charge:_____Sign:_____Date:_____

The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.

No.	Item	Yes	Not required / Remarks
	Job Specific Permit Required :		
1.	Height Work Permit Required		
2.	Hot Work Permit Required		
3.	Confined Space Work Permit Required		
4.	Excavation Work Permit Required		
5.	Radiation Work Permit Required		
6.	Heavy / Complex / Critical Lifting Activity Permit Required		
7.	Night Work / Holiday Work Permit Required		
8.	Loading / Unloading Permit Required		
9.	Grating / Safety Net / Safety Facility Removal Permit Required		
10.	Lockout / Tag out Request Permit Required		
11.	Other Permit required. Pl specify :		
	Specific PPEs for the Activity:		
1.	Dust Mask/ other respiratory equipment required. List details:		
2.	Welding and/or Grinding Shield required.		
3.	Gloves: Leather ( ) / PVC ( ) / Welding ( )		
4.	Other PPE, List:		
	Procedure Required :		
1.	OCP No. Ref :		

Declaration:

All the points mentioned in the above checklist have been checked and found OK.

Permit Receiver:

Site Engineer (Sub- Contractor):	
Signature:	
Name:	Designation:

Site Safety Officer (Sub-Contractor):	
Signature:	
Name:	Designation:

Permit Issuer:

Engineer of Concerned Execution Department (BHEL):	
Signature:	
Name:	Designation:

Site Safety Officer (BHEL):	
Signature:	
Name:	Designation:

Package-in-charge (BHEL):	
Signature:	
Name:	Designation:

(This permit is valid only for max. 15 days)

Original: Permittee		**2nd Copy: Sub-Contractor Deptt. HOS**		**3rd Copy: BHEL Site HSE**	

HSEP:12-F02

WORK AT HEIGHT PERMIT	Permit No. & Date
Project & Unit:	Emergency Contact Nos
Agency:	

Exact Location of Work:_____

Nature / Description of Work:_____

_____

Duration of Work Execution *: From Date:_____to Date:_____Daily from _____ hrs. to _____hrs.

Name of Agency Performing the Work: _____

Name of Agency's Site Engineer (Permit Requesting Authority):_____Sign:_____
Name of Agency's Package In-charge:_____Sign:_____Date:_____

The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.

No.	Item	Yes	Not required / Remarks
1.	All workers on job are competent and medically fit (No Height Phobia) for working at height		
2.	Horizontal life lines are provided to cater to design specification of 2300 kg per person and are installed on a rigid & independent structure		
3.	Safety harness with life line support/ fall arrester are checked and available in working condition		
4.	Scaffolding soundness inspected is available for use with valid tag		
5.	Work platform is not made of bamboo or weak material. Barricading is available with Top, Mid Rails and Toe Guard.		
6.	Working platform is clean without any unwanted material. Floor openings are covered.		
7.	Access and exit to workplace are safe, marked and without obstruction.		
8.	Adequate lighting provided (for dark hours) as per applicable lux standards (Refer HSEP:13)		
9.	Safety nets are provided below working area as secondary line of fall protection		
10.	Area below the working platform has been cleared of all activity		
11.	Ladders have been secured, inspected and provided as per BHEL standard/contract.		
12.	Safety shoes (non-slip), Helmet with chin strip available with employees		
13.	Visible Signboards provided on working platforms in workers' understandable language		
14.	All lifting / tightening tools, hand tools/equipment checked and in good condition		
15.	ELCB provided for Electrical connections individually. Electrical cable, welding Hose/Compressed air hose properly secured and laid down without obstruction. Earth resistance is OK.		
16.	Crane / Winch / Hydra operator is qualified and experienced		
17.	Emergency response team & Medical Facilities available.		
18.	Work hazards are identified, controlled and communicated to the worker.		
19.	Method Statements/ Job Safety Analyses attached:		
20.	Other:		
21.	List of Other Permits Required for the Activity (Attached):		

Declaration:

All the points mentioned in the above checklist have been checked and found OK.

Permit Receiver:

Site Engineer (Agency):	
Signature:	
Name:	Designation:

Site HSE Officer (Agency):	
Signature:	
Name:	Designation:

Permit Issuer:

Site Engineer (BHEL):	
Signature:	
Name:	Designation:

Site HSE Officer (BHEL):	
Signature:	
Name:	Designation:

Package-in-charge (BHEL):	
Signature:	
Name:	Designation:

(* Permit valid for 7 days, subject to daily renewal, and extension as per overleaf instructions / record formats)

Original: Permittee		2nd Copy: Agency Deptt. HOS		3rd Copy: BHEL Site HSE	

P.T.O.

To be printed on both sides of an A4 Sheet

Work at Height Permit No. & Date:
_____

Daily Work Area Condition Endorsement

Sl. No.	Date	Signature with Date & Time			Remarks
		Agency Site Engineer	Agency HSE Officer	BHEL HSE Officer	
Day 2					
Day 3					
Day 4					
Day 5					
Day 6					
Day 7					

Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From……. (Date, Time)	To…… (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer (PIA)	BHEL HSE Officer
1.							
2.							
3.							
4.							
5.							
6							

Permit Closure After Work Completion

Permit is here by returned after completing the job & ensuring safe removal of men and material.	
Site Engineer, Agency	**Site HSE Officer, Agency**
Signature:	Signature:
Name:	Name:
Verified the area is safe and Permit is Closed	
Site HSE Officer, BHEL	**Site Engineer, BHEL**
Signature:	Signature:
Name:	Name:

General Instructions:

1. Each Permit shall be given a unique number and recorded.
2. Method Statement & Job Safety Analysis for the critical tasks to be ensured by concerned engineers and attached
3. Any other Work Permits required for the task to be taken and attached along with this Permit
4. Ensue that workers and supervisors involved are trained & medical checkup done
5. This permit must be available at the work site all the times of the work.
6. Location and description of the work must be clearly indicated by the permittee.
7. Terms applicable must be clearly indicated by the permittee.
8. This permit shall be endorsed each day by the agency and BHEL only after checking compliance to all points. Any violations shall be resolved before proceeding.
9. Compliance to Permit conditions to be checked regularly by concerned execution department
10. Permit shall be issued for not more than **7 days** including the issue date.
11. Permit shall be returned to the HSE Department of BHEL after completion of the job and closed.
12. All additional safety precautions to be taken as per HSE Management System.

(For system details, please refer HSEP12: HSE Procedure for Permit to Work)

Distribution

Original- Permittee – At Site, **Duplicate** –Agency Department HOS, **Contractor**, Triplicate - Site HSE Dept.

HSEP:12-F03

BURNING/ WELDING/ HOT WORK PERMIT	Permit No. & Date
Project & Unit:	Emergency Contact Nos
Agency:	

Exact Location of Work:_____

Nature / Description of Work:_____

_____

Duration of Work Execution *: From Date:_____to Date:_____Daily from _____ hrs. to _____hrs.

Name of Agency Performing the Work: _____

Name of Agency's Site Engineer (Permit Requesting Authority):_____Sign:_____
Name of Agency's Package In-charge:_____Sign:_____Date:_____

The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.

No.	Item	Yes	Not required / Remarks
1.	Welding area ensured safe and free from all hazards (explosives etc.) with barricading and safe inlet / exit		
2.	Proper ventilation and /or lighting provided (in case of dark hours).		
3.	Welding platform ensured safe and strong. Not built of bamboo or similar material		
4.	For enclosed / confined spaces, the integrity of the structure and supports are ensured, Gas Testing done		
5.	Gas hoses, Welding machine input/output cables, welding holder and weld return clamp (Holder) are in good condition, routed and insulated as required		
6.	Emergency STOP buttons are in working condition. Welder /Helper knows how to operate it.		
7.	Welder & Fitter trained to connect ground/work return clamps (Holder) to work place prior to energization of welding machine.		
8.	Gas cylinders are stacked vertically and not below the welding / cutting area. Regulator key is available with cylinder. Gas cylinders covered with shields to prevent falling splinters.		
9.	Pressure gauges/Flash back arrestor (at both ends) provided and in working condition.		
10.	Personal Protective equipment Minimum applicable: safety helmet, safety goggles, welding helmet, safety shoes, leather gloves, long sleeve and nose mask -provided		
11.	In case of pits, water removed from the pit and wood/rubber insulation provided.		
12.	Safety signboards / cautions are in place.		
13.	Adequate and Suitable nos. of firefighting extinguisher provided. Sufficient water for firefighting available.		
14.	Nearby combustible material removed. Housekeeping done.		
15.	Emergency response team & Medical Facilities available.		
16.	Work hazards are identified, controlled and communicated to the worker.		
17.	Method Statements/ Job Safety Analyses attached:		
18.	Other:		
19.	List of Other Permits Required for the Activity (Attached):		

Declaration:

All the points mentioned in the above checklist have been checked and found OK.

Permit Receiver:

Site Engineer (Agency):	
Signature:	
Name:	Designation:

Site HSE Officer (Agency):	
Signature:	
Name:	Designation:

Permit Issuer:

Site Engineer (BHEL):	
Signature:	
Name:	Designation:

Site HSE Officer (BHEL):	
Signature:	
Name:	Designation:

Package-in-charge (BHEL):	
Signature:	
Name:	Designation:

(* Permit valid for 7 days, subject to daily renewal, and extension as per overleaf instructions / record formats)

Original: Permittee		2nd Copy: Agency Deptt. HOS		3rd Copy: BHEL Site HSE	

P.T.O. **To be printed on both sides of an A4 Sheet**

Hot Work Permit No. & Date: _____

Daily Work Area Condition Endorsement

Sl. No.	Date	Signature with Date & Time			Remarks
		Agency Site Engineer	Agency HSE Officer	BHEL HSE Officer	
Day 2					
Day 3					
Day 4					
Day 5					
Day 6					
Day 7					

Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From……. (Date, Time)	To…… (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer (PIA)	BHEL HSE Officer
1.							
2.							
3.							
4.							
5.							
6							

Permit Closure After Work Completion

Permit is here by returned after completing the job & ensuring safe removal of men and material.	
Site Engineer, Agency	**Site HSE Officer, Agency**
Signature:	Signature:
Name:	Name:
Verified the area is safe and Permit is Closed	
Site HSE Officer, BHEL	**Site Engineer, BHEL**
Signature:	Signature:
Name:	Name:

General Instructions:

1. Each Permit shall be given a unique number and recorded.
2. Method Statement & Job Safety Analysis for the critical tasks to be ensured by concerned engineers and attached
3. Any other Work Permits required for the task to be taken and attached along with this Permit
4. Ensue that workers and supervisors involved are trained & medical checkup done
5. This permit must be available at the work site all the times of the work.
6. Location and description of the work must be clearly indicated by the permittee.
7. Terms applicable must be clearly indicated by the permittee.
8. This permit shall be endorsed each day by the agency and BHEL only after checking compliance to all points. Any violations shall be resolved before proceeding.
9. Compliance to Permit conditions to be checked regularly by concerned execution department
10. Permit shall be issued for not more than **7 days** including the issue date.
11. Permit shall be returned to the HSE Department of BHEL after completion of the job and closed.
12. All additional safety precautions to be taken as per HSE Management System.

(For system details, please refer HSEP12: HSE Procedure for Permit to Work)

Distribution

Original- Permittee – At Site, **Duplicate** –Agency Department HOS, **Contractor**, Triplicate - Site HSE Dept.,

HSEP:12-F04

SAFETY WORK CLEARANCE	Permit no.
Project:	Emergency Contact Nos:
BHEL Sub-contractor:	

CONFINED SPACE ENTRY PERMIT

Area of work: _____ Date: _____ Time: _____

Name of Sub-Contractor Site Engineer (Permit Requesting Authority): _____ Sign: _____

Name of Work Performing Contractor: _____

Name of Package In charge: _____ Sign: _____ Date: _____

Description of Work: _____

_____

Duration of Work Execution*: From Time: _____ Date: _____ to Time: _____Date:_____

The above signing person(s) will be responsible to ensure that the above described work will be done under all the safety precautions mentioned on the permit to work.

The following precautions are to be taken:

No.	Item	Yes	Not required / Remarks
1.	Has the equipment been Isolated from Power/Steam/Air?		
2.	Has the equipment been Isolated from liquid or gasses?		
3.	Has the equipment been de-pressurized &/or drained?		
4.	Has the equipment been Blanked/blinded or disconnected?		
5.	Has the equipment been water flushed &/or steamed?		
6.	Whether man ways open and ventilated?		
7.	Whether constant Inert gas flow arranged?		
8.	Whether mechanically ventilated and adequately cooled?		
9.	Whether 24 V lighting provided inside the confined space?		
10.	Whether Radiation sources removed?		
11.	Whether training on confined space provided to the group?		
12.	Whether required PPEs (hand gloves, goggles, face shield, ear plug/muff, protective clothing etc.) used?		
13.	Whether Safety harness and Lifeline used?		
14.	Whether Dust/Gas/Air Line mask used?		
15.	Whether attendant with SCBA/Air mask available?		
16.	Whether grounded air Exhaust/Blower/ AC provided?		
17.	Whether Personal Gas alarm provided?		
18.	Whether communication Equipment Provided?		
19.	Whether rescue equipment/team available?		
20.	Whether firefighting arrangement done		
21.	**Others:**		

Name of Sub-Contractor Safety Officer: _____ Sign: _____ Date: _____ Time: _____

Reviewed and approved by BHEL Site Engineer (Permit Issuing Authority):

Name: _____ Sign: _____ Date: _____ Time: _____

Name of BHEL Safety Representative: _____ Sign: _____

I understand the precaution to be taken as described above and as per project requirement and hereby confirm that work will be executed under my supervision by following all precaution and Safety Rules.

Name of Work Performing Authority: _____Sign: _____ Date: _____ Time: _____

Permit Cancellation / Closure:

I hereby declare that the work is cancelled/complete, all workers under my control have been withdrawn and the site restored to safe tidy condition.

Name of Work performing Authority: _____ Sign: _____ Date: _____ Time: ____

Name of SC Site Engr. (Permit Requesting Authority): _____ Sign: _____ Date: _____ Time: ____

Name of BHEL Site Engr. (Permit Issuing Authority): _____ Sign: _____ Date: _____ Time: ____

(* Permit valid subject to daily renewal as per overleaf instructions)

Original at BHEL site	Second Copy – BHEL SAFETY	Third Copy:BHEL Sub-Contractor

PERMIT RENEWAL

Sl. No.	Extension Period		Signature of Contractor Site Engineer	Signature of Contractor /BHEL Safety Officer
	(Date) From…….. To……..	(Time- Hrs) From…….. To……..		
1.				
2.				
3.				
4.				
5.				
6				

TO BE SIGNED JOINTLY BY THE CONTRACTOR HSE & EXECUTION AFTER THE WORK IS OVER
Permit is here by returned / closed after completing the job.

Site Engineer, Contractor	Site HSE Engineer, EPC Contractor
Certified that the subject work has been completed /stopped and the area cleaned.	Certified that the subject work has been completed/stopped and the area cleaned.
Signature (With Dt. & Time):	Signature (With Dt. & Time):
Name:	Name:

General Instructions:

1. Permittee to observe precautions as mentioned on pre-page, mentioned by concerned discipline coordinator.
2. Permit must be available at the site all the time during work with permit receiver.
3. This Permit is valid for maximum7 days or as indicated. Every day permit shall be renewed before start of the shift by EPC contractor both HSE and Site Engineer.
4. Work location to be constantly supervised by Contractor and BHEL HSE and Execution, to ensure precautions as per this Permit and other HSE requirements

HSEP:12-F05

EXCAVATION WORK PERMIT	Permit No. & Date
Project & Unit:	Emergency Contact Nos
Agency:	

Exact Location of Work:_____

Nature / Description of Work:_____

_____

Duration of Work Execution *: From Date:_____to Date:_____Daily from _____ hrs. to _____hrs.

Name of Agency Performing the Work: _____

Name of Agency's Site Engineer (Permit Requesting Authority):_____Sign:_____
Name of Agency's Package In-charge:_____Sign:_____Date:_____

The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.

No.	Item	Yes	Not required / Remarks
1.	Precautions taken for Underground Electrical Cable		
2.	Precautions taken for Under / Above ground sewer/Drinking Water Line		
3.	Precautions taken for Underground Telecommunication Line		
4.	Precautions taken for Underground Product/Utility Line		
5.	Precautions taken for Underground Fire Water Line		
6.	Shoring / Shuttering / Sheet piling done to prevent collapse of excavation walls. Strength of Excavation wall ensured at all times		
7.	Hard Barricading & Edge Protection provided		
8.	Separate Safe Access for Man and Vehicle		
9.	Lighting arrangement		
10.	Banks Man Provided		
11.	Required basic PPEs provided		
12.	Slope Cutting/Benching Maintained		
13.	Excavated soil / Construction Material / equipment kept away from the edge.		
14.	Emergency response team & Medical Facilities available.		
15.	Work hazards are identified, controlled and communicated to the worker.		
16.	Method Statements/ Job Safety Analyses attached:		
17.	Other:		
18.	List of Other Permits Required for the Activity (Attached):		

Declaration:

All the points mentioned in the above checklist have been checked and found OK.

Permit Receiver:

Site Engineer (Agency):	
Signature:	
Name:	Designation:

Site HSE Officer (Agency):	
Signature:	
Name:	Designation:

Permit Issuer:

Site Engineer (BHEL):	
Signature:	
Name:	Designation:

Site HSE Officer (BHEL):	
Signature:	
Name:	Designation:

Package-in-charge (BHEL):	
Signature:	
Name:	Designation:

(* Permit valid for 7 days, subject to daily renewal, and extension as per overleaf instructions / record formats)

Original: Permittee		2nd Copy: Agency Deptt. HOS		3rd Copy: BHEL Site HSE	

P.T.O.

To be printed on both sides of an A4 Sheet

Excavation Permit No. & Date: _____

Daily Work Area Condition Endorsement

Sl. No.	Date	Signature with Date & Time			Remarks
		Agency Site Engineer	Agency HSE Officer	BHEL HSE Officer	
Day 2					
Day 3					
Day 4					
Day 5					
Day 6					
Day 7					

Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From……. (Date, Time)	To…… (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer (PIA)	BHEL HSE Officer
1.							
2.							
3.							
4.							
5.							
6							

Permit Closure After Work Completion

Permit is here by returned after completing the job & ensuring safe removal of men and material.	
Site Engineer, Agency	**Site HSE Officer, Agency**
Signature:	Signature:
Name:	Name:
Verified the area is safe and Permit is Closed	
Site HSE Officer, BHEL	**Site Engineer, BHEL**
Signature:	Signature:
Name:	Name:

General Instructions:

1. Each Permit shall be given a unique number and recorded.
2. Method Statement & Job Safety Analysis for the critical tasks to be ensured by concerned engineers and attached
3. Any other Work Permits required for the task to be taken and attached along with this Permit
4. Ensue that workers and supervisors involved are trained & medical checkup done
5. This permit must be available at the work site all the times of the work.
6. Location and description of the work must be clearly indicated by the permittee.
7. Terms applicable must be clearly indicated by the permittee.
8. This permit shall be endorsed each day by the agency and BHEL only after checking compliance to all points. Any violations shall be resolved before proceeding.
9. Compliance to Permit conditions to be checked regularly by concerned execution department
10. Permit shall be issued for not more than **7 days** including the issue date.
11. Permit shall be returned to the HSE Department of BHEL after completion of the job and closed.
12. All additional safety precautions to be taken as per HSE Management System.

(For system details, please refer HSEP12: HSE Procedure for Permit to Work)

Distribution

Original- Permittee – At Site, **Duplicate** –Agency Department HOS, **Contractor**, Triplicate - Site HSE Dept.,

HSEP:12-F06

RADIATION WORK PERMIT	Permit No. & Date
Project & Unit:	Emergency Contact Nos
Agency:	

Exact Location of Work:_____

Nature / Description of Work:_____

_____

Duration of Work Execution *: From Date:_____to Date:_____Daily from _____ hrs. to _____hrs.

Name of Agency Performing the Work: _____

Name of Agency's Site Engineer (Permit Requesting Authority):_____Sign:_____
Name of Agency's Package In-charge:_____Sign:_____Date:_____

The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.

No.	Item	Yes	Not required / Remarks
1.	All the persons at the site informed/removed from the area.		
2.	Area around the source of radiation cordoned off with the rope/chord.		
3.	Radiation warning symbol/boards displayed around radiography work on rope/chord.		
4.	Radiographer worn radiation badges during testing and is within safe limits.		
5.	Radiography camera and carrying case box having radiation symbol.		
6.	Radiation Survey Meter is in working condition, calibrated & within validity period.		
7.	Radiographer has valid certificate from BARC.		
8.	Blinking light provided on road during radiography (in dark hours).		
9.	Proper required Illumination provided		
10.	Safe access and working platform provided to conduct RT work		
11.	All the persons involved in Radiography work are aware of the hazard of radiation		
12.	Emergency response team & Medical Facilities available.		
13.	Work hazards are identified, controlled and communicated to the worker.		
14.	Method Statements/ Job Safety Analyses attached:		
15.	Other:		
16.	List of Other Permits Required for the Activity (Attached):		

Declaration:

All the points mentioned in the above checklist have been checked and found OK.

Permit Receiver:

Site Engineer (Agency):	
Signature:	
Name:	Designation:

Site HSE Officer (Agency):	
Signature:	
Name:	Designation:

Permit Issuer:

Site Engineer (BHEL):	
Signature:	
Name:	Designation:

Site HSE Officer (BHEL):	
Signature:	
Name:	Designation:

Package-in-charge (BHEL):	
Signature:	
Name:	Designation:

(* Permit valid for 7 days, subject to daily renewal, and extension as per overleaf instructions / record formats)

Original: Permittee ☐ **2nd Copy: Agency Deptt. HOS** ☐ **3rd Copy: BHEL Site HSE** ☐

P.T.O. **To be printed on both sides of an A4 Sheet**

Radiation Work Permit No. & Date: _____

Daily Work Area Condition Endorsement

Sl. No.	Date	Signature with Date & Time			Remarks
		Agency Site Engineer	Agency HSE Officer	BHEL HSE Officer	
Day 2					
Day 3					
Day 4					
Day 5					
Day 6					
Day 7					

Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From……. (Date, Time)	To…… (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer (PIA)	BHEL HSE Officer
1.							
2.							
3.							
4.							
5.							
6							

Permit Closure After Work Completion

Permit is here by returned after completing the job & ensuring safe removal of men and material.	
Site Engineer, Agency	**Site HSE Officer, Agency**
Signature:	Signature:
Name:	Name:
Verified the area is safe and Permit is Closed	
Site HSE Officer, BHEL	**Site Engineer, BHEL**
Signature:	Signature:
Name:	Name:

General Instructions:

1. Each Permit shall be given a unique number and recorded.
2. Method Statement & Job Safety Analysis for the critical tasks to be ensured by concerned engineers and attached
3. Any other Work Permits required for the task to be taken and attached along with this Permit
4. Ensue that workers and supervisors involved are trained & medical checkup done
5. This permit must be available at the work site all the times of the work.
6. Location and description of the work must be clearly indicated by the permittee.
7. Terms applicable must be clearly indicated by the permittee.
8. This permit shall be endorsed each day by the agency and BHEL only after checking compliance to all points. Any violations shall be resolved before proceeding.
9. Compliance to Permit conditions to be checked regularly by concerned execution department
10. Permit shall be issued for not more than **7 days** including the issue date.
11. Permit shall be returned to the HSE Department of BHEL after completion of the job and closed.
12. All additional safety precautions to be taken as per HSE Management System.

(For system details, please refer HSEP12: HSE Procedure for Permit to Work)

Distribution

Original- Permittee – At Site, **Duplicate** –Agency Department HOS, **Contractor**, Triplicate - Site HSE Dept.,

HSEP:12-F07

HEAVY/ COMPLEX/ CRITICAL LIFTING ACTIVITY WORK PERMIT	Permit No. & Date
Project & Unit:	Emergency Contact Nos
Agency:	

Exact Location of Work:_____

Nature / Description of Work:_____

_____

Duration of Work Execution *: From Date:_____to Date:_____Daily from _____ hrs. to _____hrs.

Name of Agency Performing the Work: _____

Name of Agency's Site Engineer (Permit Requesting Authority):_____Sign:_____
Name of Agency's Package In-charge:_____Sign:_____Date:_____

The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.

No.	Item	Yes	Not required / Remarks
1.	Crane used for lifting activity TPI tested, certified and approved for rated lifting		
2.	All lifting tackles, gears/appliances (chain pulley blocks, wire rope slings etc.) are tested and certified for lifting works with valid Serial numbers traceable to certificates.		
3.	Chain Pulley Blocks are exclusively used for alignment, not loading		
4.	Crane operator is trained and competent for lifting operation.		
5.	Lifting sling/ belt is protected against sharp edge of the jobs to be lifted.		
6.	Lifting hook is properly latched to prevent material falling over		
7.	Access and exit marked and without obstruction.		
8.	In case of lifting multiple materials at once, same are tied up with strong rope / material		
9.	Area below lifting activity barricaded to prevent movement		
10.	Minimum 2 guidelines have been provided for balancing and guiding jobs to be lifted.		
11.	Periphery area of crane booms as well as lifting job is barricaded and unauthorized/no-entry sign board posted.		
12.	Rigger and signal man is trained and competent for lifting work.		
13.	No lifting activity to be carried out during lightening, heavy wind/rain.		
14.	If scaffolding to be used during lift, scaffolding with valid tag available for use.		
15.	Emergency response team & Medical Facilities available.		
16.	Work hazards are identified, controlled and communicated to the worker.		
17.	Method Statements/ Job Safety Analyses/ Lifting Plan attached:		
18.	Other:		
19.	List of Other Permits Required for the Activity (Attached):		

Declaration:

All the points mentioned in the above checklist have been checked and found OK.

Permit Receiver:

Site Engineer (Agency):	
Signature:	
Name:	Designation:

Site HSE Officer (Agency):	
Signature:	
Name:	Designation:

Permit Issuer:

Site Engineer (BHEL):	
Signature:	
Name:	Designation:

Site HSE Officer (BHEL):	
Signature:	
Name:	Designation:

Package-in-charge (BHEL):	
Signature:	
Name:	Designation:

(* Permit valid for 7 days, subject to daily renewal, and extension as per overleaf instructions / record formats)

Original: Permittee		2nd Copy: Agency Deptt. HOS		3rd Copy: BHEL Site HSE	

P.T.O.

To be printed on both sides of an A4 Sheet

Critical lifting Permit No. & Date: _____

Daily Work Area Condition Endorsement

Sl. No.	Date	Signature with Date & Time			Remarks
		Agency Site Engineer	Agency HSE Officer	BHEL HSE Officer	
Day 2					
Day 3					
Day 4					
Day 5					
Day 6					
Day 7					

Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From……. (Date, Time)	To…… (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer (PIA)	BHEL HSE Officer
1.							
2.							
3.							
4.							
5.							
6							

Permit Closure After Work Completion

Permit is here by returned after completing the job & ensuring safe removal of men and material.	
Site Engineer, Agency	**Site HSE Officer, Agency**
Signature:	Signature:
Name:	Name:
Verified the area is safe and Permit is Closed	
Site HSE Officer, BHEL	**Site Engineer, BHEL**
Signature:	Signature:
Name:	Name:

General Instructions:

1. Each Permit shall be given a unique number and recorded.
2. Method Statement & Job Safety Analysis for the critical tasks to be ensured by concerned engineers and attached
3. Any other Work Permits required for the task to be taken and attached along with this Permit
4. Ensue that workers and supervisors involved are trained & medical checkup done
5. This permit must be available at the work site all the times of the work.
6. Location and description of the work must be clearly indicated by the permittee.
7. Terms applicable must be clearly indicated by the permittee.
8. This permit shall be endorsed each day by the agency and BHEL only after checking compliance to all points. Any violations shall be resolved before proceeding.
9. Compliance to Permit conditions to be checked regularly by concerned execution department
10. Permit shall be issued for not more than **7 days** including the issue date.
11. Permit shall be returned to the HSE Department of BHEL after completion of the job and closed.
12. All additional safety precautions to be taken as per HSE Management System.

(Please refer HSEP12: HSE Procedure for Permit to Work for details of critical lift and permit workflow)

Distribution

Original- Permittee – At Site, **Duplicate** –Agency Department HOS, **Contractor**, Triplicate - Site HSE Dept.,

HSEP:12-F08

NIGHT WORK PERMIT	Permit No. & Date
Project & Unit:	Emergency Contact Nos
Agency:	

Exact Location of Work:_____

Nature / Description of Work:_____

_____

Duration of Work Execution *: From Date:_____to Date:_____Daily from _____ hrs. to _____hrs.

Name of Agency Performing the Work: _____

Name of Agency's Site Engineer (Permit Requesting Authority):_____Sign:_____
Name of Agency's Package In-charge:_____Sign:_____Date:_____

The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.

No.	Item	Yes	Not required / Remarks
1.	No heavy complex work is being carried out involving heavy, moving machinery etc. during night work		
2.	Proper illumination (lux value) as per prescribed standards has been provided		
3.	All required safety precautions / Permits /PPEs have been taken		
4.	Work area certified safe (with barricading, w/o hazards, proper access / ingress)		
5.	Workers are trained for the task		
6.	Adequate supervision is in order during the course of work		
7.	Emergency response team & Medical Facilities available.		
8.	Work hazards are identified, controlled and communicated to the worker.		
9.	Method Statements/ Job Safety Analyses attached:		
10.	Other:		
11.	List of Other Permits Required for the Activity (Attached):		

Declaration:

All the points mentioned in the above checklist have been checked and found OK.

Permit Receiver:

Site Engineer (Agency):	
Signature:	
Name:	Designation:

Site HSE Officer (Agency):	
Signature:	
Name:	Designation:

Permit Issuer:

Site Engineer (BHEL):	
Signature:	
Name:	Designation:

Site HSE Officer (BHEL):	
Signature:	
Name:	Designation:

Package-in-charge (BHEL):	
Signature:	
Name:	Designation:

(* Permit valid for 7 days, subject to daily renewal, and extension as per overleaf instructions / record formats)

Original: Permittee		2nd Copy: Agency Deptt. HOS		3rd Copy: BHEL Site HSE	

P.T.O. **To be printed on both sides of an A4 Sheet**

Night work Permit No. & Date: _____

Daily Work Area Condition Endorsement

Sl. No.	Date	Signature with Date & Time			Remarks
		Agency Site Engineer	Agency HSE Officer	BHEL HSE Officer	
Day 2					
Day 3					
Day 4					
Day 5					
Day 6					
Day 7					

Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From……. (Date, Time)	To…… (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer (PIA)	BHEL HSE Officer
1.							
2.							
3.							
4.							
5.							
6							

Permit Closure After Work Completion

Permit is here by returned after completing the job & ensuring safe removal of men and material.	
Site Engineer, Agency	**Site HSE Officer, Agency**
Signature:	Signature:
Name:	Name:
Verified the area is safe and Permit is Closed	
Site HSE Officer, BHEL	**Site Engineer, BHEL**
Signature:	Signature:
Name:	Name:

General Instructions:

1. Each Permit shall be given a unique number and recorded.
2. Method Statement & Job Safety Analysis for the critical tasks to be ensured by concerned engineers and attached
3. Any other Work Permits required for the task to be taken and attached along with this Permit
4. Ensue that workers and supervisors involved are trained & medical checkup done
5. This permit must be available at the work site all the times of the work.
6. Location and description of the work must be clearly indicated by the permittee.
7. Terms applicable must be clearly indicated by the permittee.
8. This permit shall be endorsed each day by the agency and BHEL only after checking compliance to all points. Any violations shall be resolved before proceeding.
9. Compliance to Permit conditions to be checked regularly by concerned execution department
10. Permit shall be issued for not more than **7 days** including the issue date.
11. Permit shall be returned to the HSE Department of BHEL after completion of the job and closed.
12. All additional safety precautions to be taken as per HSE Management System.

(For system details, please refer HSEP12: HSE Procedure for Permit to Work)

Distribution

Original- Permittee – At Site, **Duplicate** –Agency Department HOS, **Contractor**, Triplicate - Site HSE Dept.,

HSEP:12-F09

LOADING/ UNLOADING PERMIT	Permit No. & Date
Project & Unit:	Emergency Contact Nos
Agency:	

Exact Location of Work:_____

Nature / Description of Work:_____

Duration of Work Execution *: From Date:_____ to Date:_____ Daily from_____ hrs. to_____ hrs.

Name of Agency Performing the Work: _____

Name of Agency's Site Engineer (Permit Requesting Authority):_____ Sign:_____

Name of Agency's Package In-charge:_____ Sign:_____ Date:_____

The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.

No.	Item	Yes	Not required / Remarks
1.	Sufficient Area has been provided for material unloading		
2.	Material loaded properly / Safety precautions taken – Unlashing can be undertaken. (In case loosening the material lashes could lead to material falling in uncontrolled manner)		
3.	Loading / Unloading Cranes, T&Ps are in order with valid TPI certificate.		
4.	Workers involved are properly trained and sensitized to the dangers		
5.	Crane operator is authorized.		
6.	Communication methodology between different gangs is in place. Communication gear (walkie-talkie sets etc.) provided where required		
7.	Adequate supervision is in order		
8.	Area barricaded including backside movement of crane.		
9.	Emergency response team & Medical Facilities available.		
10.	Work hazards are identified, controlled and communicated to the worker.		
11.	Method Statements/ Job Safety Analyses attached:		
12.	Other:		
13.	List of Other Permits Required for the Activity (Attached):		

Declaration:

All the points mentioned in the above checklist have been checked and found OK.

Permit Receiver:

Site Engineer (Agency):	
Signature:	
Name:	Designation:

Site HSE Officer (Agency):	
Signature:	
Name:	Designation:

Permit Issuer:

Site Engineer (BHEL):	
Signature:	
Name:	Designation:

Site HSE Officer (BHEL):	
Signature:	
Name:	Designation:

Package-in-charge (BHEL):	
Signature:	
Name:	Designation:

(* Permit valid for 7 days, subject to daily renewal, and extension as per overleaf instructions / record formats)

Original: Permittee		2nd Copy: Agency Deptt. HOS		3rd Copy: BHEL Site HSE	

P.T.O. **To be printed on both sides of an A4 Sheet**

Loading/Unloading Permit No. & Date:

Daily Work Area Condition Endorsement

Sl. No.	Date	Signature with Date & Time			Remarks
		Agency Site Engineer	Agency HSE Officer	BHEL HSE Officer	
Day 2					
Day 3					
Day 4					
Day 5					
Day 6					
Day 7					

Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From……. (Date, Time)	To…… (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer (PIA)	BHEL HSE Officer
1.							
2.							
3.							
4.							
5.							
6							

Permit Closure After Work Completion

Permit is here by returned after completing the job & ensuring safe removal of men and material.	
Site Engineer, Agency	**Site HSE Officer, Agency**
Signature:	Signature:
Name:	Name:
Verified the area is safe and Permit is Closed	
Site HSE Officer, BHEL	**Site Engineer, BHEL**
Signature:	Signature:
Name:	Name:

General Instructions:

1. Each Permit shall be given a unique number and recorded.
2. Method Statement & Job Safety Analysis for the critical tasks to be ensured by concerned engineers and attached
3. Any other Work Permits required for the task to be taken and attached along with this Permit
4. Ensue that workers and supervisors involved are trained & medical checkup done
5. This permit must be available at the work site all the times of the work.
6. Location and description of the work must be clearly indicated by the permittee.
7. Terms applicable must be clearly indicated by the permittee.
8. This permit shall be endorsed each day by the agency and BHEL only after checking compliance to all points. Any violations shall be resolved before proceeding.
9. Compliance to Permit conditions to be checked regularly by concerned execution department
10. Permit shall be issued for not more than **7 days** including the issue date.
11. Permit shall be returned to the HSE Department of BHEL after completion of the job and closed.
12. All additional safety precautions to be taken as per HSE Management System.

(For system details, please refer HSEP12: HSE Procedure for Permit to Work)

Distribution

Original- Permittee – At Site, **Duplicate** –Agency Department HOS, **Contractor**, Triplicate - Site HSE Dept.,

HSEP:12-F10

SAFETY FACILITY REMOVAL PERMIT	Permit No. & Date
Project & Unit:	Emergency Contact Nos
Agency:	

Exact Location of Work:_____

Nature / Description of Work:_____

_____

Duration of Work Execution *: From Date:_____to Date:_____Daily from _____ hrs. to _____hrs.

Name of Agency Performing the Work: _____

Name of Agency's Site Engineer (Permit Requesting Authority):_____Sign:_____
Name of Agency's Package In-charge:_____Sign:_____Date:_____

The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.

No.	Item	Yes	Not required / Remarks
1.	Has the area been hard barricaded (tape/rope not to be used), to cordoned off area		
2.	Has signage been displayed to caution others of the hazard		
3.	Has proper illumination been arranged to ensure area is well lit as required		
4.	Are personal fall arrest systems being used around hole-opening as required?		
5.	Is a structurally solid hole-cover, marked with do not remove notice being used		
6.	Has the grating been properly installed with clamp/ nut & bolt/ welded		
7.	Emergency response team & Medical Facilities available.		
8.	Work hazards are identified, controlled and communicated to the worker.		
9.	Method Statements/ Job Safety Analyses attached:		
10.	Other:		
11.	List of Other Permits Required for the Activity (Attached):		

Declaration:

All the points mentioned in the above checklist have been checked and found OK.

Permit Receiver:

Site Engineer (Agency):	
Signature:	
Name:	Designation:

Site HSE Officer (Agency):	
Signature:	
Name:	Designation:

Permit Issuer:

Site Engineer (BHEL):	
Signature:	
Name:	Designation:

Site HSE Officer (BHEL):	
Signature:	
Name:	Designation:

Package-in-charge (BHEL):	
Signature:	
Name:	Designation:

(* Permit valid for 7 days, subject to daily renewal, and extension as per overleaf instructions / record formats)

Original: Permittee		2nd Copy: Agency Deptt. HOS		3rd Copy: BHEL Site HSE	

P.T.O. **To be printed on both sides of an A4 Sheet**

Safety facility removal Permit No. & Date:

Daily Work Area Condition Endorsement

Sl. No.	Date	Signature with Date & Time			Remarks
		Agency Site Engineer	Agency HSE Officer	BHEL HSE Officer	
Day 2					
Day 3					
Day 4					
Day 5					
Day 6					
Day 7					

Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From……. (Date, Time)	To…… (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer (PIA)	BHEL HSE Officer
1.							
2.							
3.							
4.							
5.							
6							

Permit Closure After Work Completion

Permit is here by returned after completing the job & ensuring safe removal of men and material.	
Site Engineer, Agency	**Site HSE Officer, Agency**
Signature:	Signature:
Name:	Name:
Verified the area is safe and Permit is Closed	
Site HSE Officer, BHEL	**Site Engineer, BHEL**
Signature:	Signature:
Name:	Name:

General Instructions:

1. Each Permit shall be given a unique number and recorded.
2. Method Statement & Job Safety Analysis for the critical tasks to be ensured by concerned engineers and attached
3. Any other Work Permits required for the task to be taken and attached along with this Permit
4. Ensue that workers and supervisors involved are trained & medical checkup done
5. This permit must be available at the work site all the times of the work.
6. Location and description of the work must be clearly indicated by the permittee.
7. Terms applicable must be clearly indicated by the permittee.
8. This permit shall be endorsed each day by the agency and BHEL only after checking compliance to all points. Any violations shall be resolved before proceeding.
9. Compliance to Permit conditions to be checked regularly by concerned execution department
10. Permit shall be issued for not more than **7 days** including the issue date.
11. Permit shall be returned to the HSE Department of BHEL after completion of the job and closed.
12. All additional safety precautions to be taken as per HSE Management System.

(For system details, please refer HSEP12: HSE Procedure for Permit to Work)

Distribution

Original- Permittee – At Site, **Duplicate** –Agency Department HOS, **Contractor**, Triplicate - Site HSE Dept.

HSEP:12-F11

LOCKOUT TAGOUT WORK PERMIT	Permit No. & Date
Project & Unit:	Emergency Contact Nos
Agency:	

Exact Location of Work:_____

Nature / Description of Work:_____

Duration of Work Execution *: From Date:_____to Date:_____Daily from _____ hrs. to _____hrs.

Name of Agency Performing the Work: _____

Name of Agency's Site Engineer (Permit Requesting Authority):_____Sign:_____
Name of Agency's Package In-charge:_____Sign:_____Date:_____

The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.
The following precautions are to be taken:

Tag No.	Device to be Tagged / Locked I.D. No.	Device Location	Device Position *OPEN / CLOSED - ON/OFF*	Lock No.	Tag Lock Placed by Name/Sign - Date/Time		Tag/ Lock Removed by Name/Sign - Date/Time	

Item	Yes	Not Required/ Remarks
Emergency response team & Medical Facilities available.		
Work hazards are identified, controlled and communicated to the worker.		
Method Statements/ Job Safety Analyses attached:		
Other:		
List of Other Permits Required for the Activity (Attached):		

Declaration:

All the points mentioned in the above checklist have been checked and found OK.

Permit Receiver:

Site Engineer (Agency):	
Signature:	
Name:	Designation:

Site HSE Officer (Agency):	
Signature:	
Name:	Designation:

Permit Issuer:

Site Engineer (BHEL):	
Signature:	
Name:	Designation:

Site HSE Officer (BHEL):	
Signature:	
Name:	Designation:

Package-in-charge (BHEL):	
Signature:	
Name:	Designation:

(* Permit valid for 7 days, subject to daily renewal, and extension as per overleaf instructions / record formats)

Original: Permittee		2nd Copy: Agency Deptt. HOS		3rd Copy: BHEL Site HSE	

P.T.O.

To be printed on both sides of an A4 Sheet

Lockout Tagout Permit No. & Date: _____

Daily Work Area Condition Endorsement

Sl. No.	Date	Signature with Date & Time			Remarks
		Agency Site Engineer	Agency HSE Officer	BHEL HSE Officer	
Day 2					
Day 3					
Day 4					
Day 5					
Day 6					
Day 7					

Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From……. (Date, Time)	To…… (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer (PIA)	BHEL HSE Officer
1.							
2.							
3.							
4.							
5.							
6							

Permit Closure After Work Completion

Permit is here by returned after completing the job & ensuring safe removal of men and material.	
Site Engineer, Agency	**Site HSE Officer, Agency**
Signature:	Signature:
Name:	Name:
Verified the area is safe and Permit is Closed	
Site HSE Officer, BHEL	**Site Engineer, BHEL**
Signature:	Signature:
Name:	Name:

General Instructions:

1. Each Permit shall be given a unique number and recorded.
2. Method Statement & Job Safety Analysis for the critical tasks to be ensured by concerned engineers and attached
3. Any other Work Permits required for the task to be taken and attached along with this Permit
4. Ensue that workers and supervisors involved are trained & medical checkup done
5. This permit must be available at the work site all the times of the work.
6. Location and description of the work must be clearly indicated by the permittee.
7. Terms applicable must be clearly indicated by the permittee.
8. This permit shall be endorsed each day by the agency and BHEL only after checking compliance to all points. Any violations shall be resolved before proceeding.
9. Compliance to Permit conditions to be checked regularly by concerned execution department
10. Permit shall be issued for not more than **7 days** including the issue date.
11. Permit shall be returned to the HSE Department of BHEL after completion of the job and closed.
12. All additional safety precautions to be taken as per HSE Management System.

(For system details, please refer HSEP12: HSE Procedure for Permit to Work)

Distribution

Original- Permittee – At Site, **Duplicate** –Agency Department HOS, **Contractor**, Triplicate - Site HSE Dept.,

HSEP:12-F12

BEAM / TRUSS/ DUCT/ STRUCTURE ALIGNMENT PERMIT	Permit No. & Date
Project & Unit:	Emergency Contact Nos:
Agency:	

Exact Location of Work:_____

Nature / Description of Work:_____

_____

Duration of Work Execution *: From Date:_____to Date:_____Daily from _____ hrs. to _____hrs.

Name of Agency Performing the Work: _____

Name of Agency's Site Engineer (Permit Requesting Authority):_____Sign:_____
Name of Agency's Package In-charge:_____Sign:_____Date:_____

The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.

No.	Item	Yes	Not required / Remarks
1.	Is the alignment procedure & Plan submitted, checked and verified safe (Please attach plan along with drawing, location & capacities of lifting tools & tackles)		
2.	Are all lifting tools & tackles, equipment tested and with valid serial numbers traceable to valid certificates		
3.	Ensured that (for load above 5 Ton) chain pulley blocks will not be used to bear full load of the hanging structure and will only be used for lateral movement. Either Winches, Leashing, Structural supports or similar arrangement will be used for hanging the load		
4.	Ensure that area below is cordoned off and barricaded		
5.	Ensured that all the workers working on the load (if any): (check whichever is applicable) a. have double lanyard safety harnesses which are hooked to a lifeline anchored with rigid structure independent of the hanging load b. have retractable fall arrestors, which are hooked to a lifeline anchored with rigid structure independent of the hanging load		
6.	Other Permits (Height Work, Hot Work etc. are ensured)		
7.	All necessary PPEs to be ensured		
8.	List of associated workers attached		
9.	Emergency response team & Medical Facilities available.		
10.	Work hazards are identified, controlled and communicated to the worker.		
11.	Method Statements/ Job Safety Analyses attached:		
12.	Other:		
13.	List of Other Permits Required for the Activity (Attached):		

Declaration:

All the points mentioned in the above checklist have been checked and found OK.

Permit Receiver:

Site Engineer (Agency):	
Signature:	
Name:	Designation:

Site HSE Officer (Agency):	
Signature:	
Name:	Designation:

Permit Issuer:

Site Engineer (BHEL):	
Signature:	
Name:	Designation:

Site HSE Officer (BHEL):	
Signature:	
Name:	Designation:

Package-in-charge (BHEL):	
Signature:	
Name:	Designation:

(* Permit valid for 7 days, subject to daily renewal, and extension as per overleaf instructions / record formats)

Original: Permittee		2nd Copy: Agency Deptt. HOS		3rd Copy: BHEL Site HSE	

P.T.O. **To be printed on both sides of an A4 Sheet**

Alignment Permit No. & Date: _____

Daily Work Area Condition Endorsement

Sl. No.	Date	Signature with Date & Time			Remarks
		Agency Site Engineer	Agency HSE Officer	BHEL HSE Officer	
Day 2					
Day 3					
Day 4					
Day 5					
Day 6					
Day 7					

Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From……. (Date, Time)	To…… (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer (PIA)	BHEL HSE Officer
1.							
2.							
3.							
4.							
5.							
6							

Permit Closure After Work Completion

Permit is here by returned after completing the job & ensuring safe removal of men and material.	
Site Engineer, Agency	**Site HSE Officer, Agency**
Signature:	Signature:
Name:	Name:
Verified the area is safe and Permit is Closed	
Site HSE Officer, BHEL	**Site Engineer, BHEL**
Signature:	Signature:
Name:	Name:

General Instructions:

1. Each Permit shall be given a unique number and recorded.
2. Method Statement & Job Safety Analysis for the critical tasks to be ensured by concerned engineers and attached
3. Any other Work Permits required for the task to be taken and attached along with this Permit
4. Ensue that workers and supervisors involved are trained & medical checkup done
5. This permit must be available at the work site all the times of the work.
6. Location and description of the work must be clearly indicated by the permittee.
7. Terms applicable must be clearly indicated by the permittee.
8. This permit shall be endorsed each day by the agency and BHEL only after checking compliance to all points. Any violations shall be resolved before proceeding.
9. Compliance to Permit conditions to be checked regularly by concerned execution department
10. Permit shall be issued for not more than **7 days** including the issue date.
11. Permit shall be returned to the HSE Department of BHEL after completion of the job and closed.
12. All additional safety precautions to be taken as per HSE Management System.

(For system details, please refer HSEP12: HSE Procedure for Permit to Work)

Distribution

Original- Permittee – At Site, **Duplicate** –Agency Department HOS, **Contractor**, Triplicate - Site HSE Dept.

	POWER SECTOR	FORMAT NO: **HSEP:13-F01** REV NO.: 01 PAGE NO. 01 OF 02
	Inspection of First Aid Box	

Name of Site :	
Name of Sub-Contractor:	
Inspected by :	
Date of Inspection:	

Number of employees in the site: -_____

Sl.No.	Item	No. Available	Remarks
1	No. of small sterilized dressings		
2	No of medium sized sterilized dressings		
3	No of large sized sterilized dressings.		
4	No of large sized sterilized burn dressings		
5	No of (15 grams) packets sterilized cotton wool		
6	No of pieces of sterilized eye pads in separate sealed packets.		
7	No of roller bandages 10 cm wide.		
8	No of roller bandages 5 cm wide.		
9	Whether tourniquet available		
10	Whether supply of suitable splints available.		
11	No of packets of safety pins.		
12	Whether kidney tray available		
13	Whether sufficient number of eye wash bottles, filled with distilled water or suitable liquid, clearly indicated by a distinctive sign which shall be visible at all times, available.		
14	Whether 4%-xylocaine eye drops, and boric acid eye drops and soda by carbonate eye drops available.		
15	Whether (60ml) bottle containing a two percent alcoholic solution of iodine available		
16	Whether (two hundred ml) bottle of mercurochrome (2 per cent) solution in water available.		
17	Whether 120ml bottle containing Sal volatile having the dose and mode of administration indicated on the label,		
18	Whether roll of adhesive plaster (6 cm X 1 meter) available		

	POWER SECTOR	FORMAT NO: **HSEP:13-F01** REV NO.: 01 PAGE NO. 01 OF 02
	Inspection of First Aid Box	

Sl. No.	Item	No. Available	Remarks
19	No of rolls of adhesive plaster (2 cmX1 meter)		
20	Whether snake bite lancet available.		
21	Whether (30 grams) bottle of potassium permanganatecrystals available.		
22	Whether a pair scissors available		
23	Whether copy of the First-Aid leaflet issued by the Director-General, Factory Advice service and labor Institutes, Government of India available.		
24	Whether bottle containing 100 tablets (each of 5 grains) of aspirin available		
25	Whether Ointment for burns available		
26	Whether bottle of a suitable surgical anti-septic solution available		
27	Whether List of Contents pasted on First Aid Box along with respective expiry dates		

Signature of Subcontractor's Site I/C Date:

	POWER SECTOR	FORMAT NO: **HSEP:13-F02** REV NO.: 01 PAGE NO. 01 OF 02
	Health Check-Up	

Name of Site :	
Name of Sub-Contractor:	
Name of Employee :	
Age:	

History Of Past Illness	H/O Epilepsy
	H/O Drug Allergy
	H/O Diabetics/ Hypertension
	H/O Unconsciousness
Personal History	

EXAMINATION	**OBSERVATION**	
General Physical Examination		
Height		
Weight		
BMI		
Built And nourishment		
Pallor		
Temperature		
Chest Expansion	Inspiration	Expansion
Lymph Node Enlargement		
Upper Limbs Strength & Function		
Lower Limbs Strength & function		
Spine Adequately flexible for the job concerned (Yes/No)		
Mental alertness and stability with good eye, hand and foot co-ordination.		
Ear, Nose, Throat		
Ear / Hearing		
Nose		
Throat		
Vision		
Left Eye	Right Eye	

	POWER SECTOR	FORMAT NO: **HSEP:13-F02** REV NO.: 01 PAGE NO. 02 OF 02
	Health Check-Up	

EXAMINATION	OBSERVATION	
Cardiovascular System Examination		
Inspection		
Palpation	Pulse	BP
Auscultation (Heart Sounds)		
Respiratory System		
Inspection	Respiratory Rate	
Palpation:		
Percussion		
Auscultation (Breath Sounds)		
Examination of Abdomen		
Inspection		
Palpation		
Auscultation (Bowel Sounds)		
Any Other		
Clinical Impression		

Signature of the examining doctor Date:

	POWER SECTOR	FORMAT NO: **HSEP:13-F03** REV NO.: 01 PAGE NO. 01 OF 01
	HSE Induction Training	

Name of Site :	
Name of Sub-Contractor :	
Date :	
Name of Training Co-ordinator:	

Sl. No.	Name	Designation	Organisation	Signature

(Training carried out as per HSEP04: HSE Procedure for Training & Awareness)

Signature of Training Coordinator Date:

	POWER SECTOR	FORMAT NO: **HSEP:13-F04** REV NO.: 00 PAGE NO. 01 OF 01
	Toolbox Talk	

Name of Site :	
Sub-Contractors Name :	
Date :	

Topic	**Name of person delivered Tool Box Talk**	**No. of Participants attended**	**Remarks**

Signature of Site I/C of Subcontractor Date:

	POWER SECTOR	FORMAT NO: **HSEP:13-F05**
	Monthly Site HSE Report	REV NO.: 01
		Page 01of **7**

Name of Site:	**Report Month:**

A) Accidents/Incidents Details: -

a	**Lost time in Accidents**	**No. of incidents**	**Man Hours Lost**	**No. of People Involved**	**No. of contractors involved**	**BHEL persons if any**	**No. of persons reported to Govt.**
	For the Month						
	Cumulative						
b	**Minor Injuries**						
	For the Month						
	Cumulative						
c	**Fires**	**No. of Near-Misses**	**No. of First- Aid cases**	**No. of persons injured**	**No. of equipment damaged**	**No. of Fire reported Outside**	
	For the Month						
	Cumulative						
d	**Other mishaps not covered in a, b, c.**	**No. of Near-Misses**	**No. of First- Aid cases**	**No. of persons injured**	**No. of equipment damaged**	**Total near misses and First-Aid**	
	For the Month						
	Cumulative						

B) Data for Man-hours worked:

Details	**BHEL(A)**	**Contractors(B)**	**Remarks if any**
No. of people			
Man Hours worked			
O.T. Hours			
Total Man Hours			
Grand Total of man hours worked during the month(A+B)			
Cumulative man-hours(from_____to_____): (Since the opening of the site)			

Signature of Head(SOX) **Signature of Site HSE Coordinator**

C) Status of Deployment of Work force, Safety Officers/Supervisors & Construction Medical Officer(s) & Electricians by Agencies:

Description	Name	Qualification & Experience
Safety Officers		
Safety Supervisors		
Construction Medical Officer		
Nursing Staff.		
Electricians		

D) Lifting Tools, Tackles, Equipment and Pressure Vessels:

Item	Nos. Deployed	Identification Nos. (Comma separated) (A)	Nos. Tested by competent person	Validities of Test Certificates (Comma separated – corresponding to column A)
Winches				
Chain Blocks				
Wire Rope Slings				
Man Cages				
D-Shackles				
Air Compressors				
Crawler Cranes				
Mobile Cranes				
Hydra Cranes				
Others				

Signature of Head(SOX) **Signature of Site HSE Coordinator**

E) Reverse Horns in Construction Vehicles:

Item	Nos. Deployed with serial numbers (Comma separated) (A)	Nos. Having Functional reverse horns	Inspection Dates (Comma separated corresponding to column A)
Transit Mixers			
Hydra Cranes			
Dumpers/Trippers			
Backhoes			
Other Vehicles			

F) ELCBs:

No. Of ELCBs provided with Serial Nos. (Comma separated)(A)	Nos. Functional	When They were last Tested (Comma separated corresponding to column A)

G) Electrical Earthing:

No. Of Earth resources with serial numbers and locations (Comma separated)(A)	Whether Double Earthing provided to all equipment	When they were last tested (Comma separated corresponding to column A)

H) Fire Extinguishers:

Name & designation of person responsible for maintenance of Extinguishers at different locations:(Individual Contractor's Safety Officers).

FIRE EXITINGUISHERS AT ERECTION SITE:

Type	Size (Add more rows if required)	Qty + Serial numbers (Comma separated) (A)	Healthiness – Last checked dates (Comma separated corresponding to column A)	Locations (Comma separated corresponding to column A)
FOAM TYPE				
SODA TYPE				
DRY TYPE (DCP)				
C02 TYPE				

Signature of Head(SOX) Signature of Site HSE Coordinator

FIRE EXTINGUISHERS AT BHEL SITE OFFICE & STORES:

Type	Size (Add more rows if required)	Qty + Serial numbers (Comma separated) (A)	Healthiness – Last checked dates (Comma separated corresponding to column A)	Locations (Comma separated corresponding to column A)
FOAM TYPE				
SODA TYPE				
DRY TYPE (DCP)				
C02 TYPE				

I) Implementation of checklist, Work permits:

Item	Numbers During the Month	Major Deviations
Note:- Please attach photocopies of all filled Checklists & Work permits for that month.		

J) Personal Protective Equipment Issued (*Extend table for each contractor*):

Item	Issued this Month	Nos. Issued up to the Month	Percentage of usage at Site (as per physical verification)
Name of Contractor:			
Safety Helmet			
Safety Shoes			
Full Body Harness			
Fall Arrestor			
Safety Nets			
Other PPEs.			

Signature of Head(SOX)

Signature of Site HSE Coordinator

K) Safety Observations by BHEL Executives- Observations package wise:

No. of Observations received in the month	No of points complied	Cumulative no. of non-complied points

L) Training programs on safety during the month:

- **Refresher Trainings Conducted: -**

Topic	Date Of Programme	No. Of Participants	Level Of Participants

- **Tool-Box talks/ Pep-talks on Safety:**

Date	Tool Box Talk - No of Participants	Topic	Remarks
Date	**Safety Induction No. of Participants**	**Topic**	**Remarks**

Signature of Head(SOX)

Signature of Site HSE Coordinator

M) Progress of Management Programmes at Site

SL	Description Of MPs	Annual Plan	Achievement In This Month	Cumulative Achievement
A. Environment Improvement Programme				
1	Plantation of Trees			
2	Installation of Scrap Bins			
3	Chemical Storage & Handling system			
B. Improvement of Working Environment				
4	Increasing LTI free days			
5	Air Quality Monitoring			
6	Water Quality Monitoring			
7	Illumination level Monitoring			

N) HR Information:

Designation	Total No. Inducted	Total no. of Induction Balance	Total no. of Gate Pass Issued	Total no. of Gate Pass Balance	Total no. of Gate Pass Cancelled	Medical Checkup Completed	Medical Checkup Balance

Signature of Head(SOX)

Signature of Site HSE Coordinator

O) Penalty Imposed On Account of Safety Violation

By Customer	On Subcontractor By BHEL	Amount (Rs)	Deducted (Yes/No, Remarks)	Brief Reason

P) Rewards on Account of Good Safety Performance

Reward issuing Agency (BHEL / Customer/ Subcontractor)	Reward Issued to	Details of Reward Issued (Amount etc.)	Brief Reason
Note: Photos of Reward Functions to be attached			

Q) Other Safety initiatives / Safety Activities conducted at sites (with photos, if any):

Signature of Head(SOX)

Signature of Site HSE Coordinator

	POWER SECTOR	FORMAT NO: **HSEP:13-F06** REV NO.: 00 PAGE NO. 01 OF 01
	Personal Protective Equipment	

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection:	

Item	**Issued this Month**	**Nos. Issued up to the Month**	**Percentage of usage at site**
Safety Helmet			
Safety Shoes			
Full Body Harness			
Fall Arrestor			
Safety Nets			
Other PPEs.			

Signature of Site I/C of Subcontractor: **Date:**

	POWER SECTOR	FORMAT NO: **HSEP:13-F07** REV NO.: 00 PAGE NO. 01 OF 01
	Inspection Of T&Ps	

Name of Site :	
Name of Sub-Contractor :	
Date of Inspection :	

Sl.No.	**Description**	**Remarks**
1.0	Name of equipment	
2.0	Basic Information of equipment	
2.1	Specification	
2.2	Sr. No. of equipment	
2.3	Make	
2.4	Year of manufacture	
3.0	Major repairs / overhauls(Furnish details of work carried out)	Date(s) of major repair/overhaul
3.1		
3.2		
3.3	Repairs carried out at site	
4.0	Any performance test conducted	Yes/No
5.0	Document Submitted	Yes/No
6.0	Manufacturer's test / guarantee certificate	Available/ Not available
7.0	Performance test	Done/ Not Done
8.0	Acceptance Norms	
9.0	Committee Observations	
10.0	Date of next review (if accepted)	
Signature-Subcontractor/ Subcontractor's Safety Officer		**Signature-Site Safety Officer (BHEL)**

	POWER SECTOR	FORMAT NO: **HSEP:13-F08**
	Status Of T&Ps	REV NO.: 01 PAGE NO. 01 OF 01

Name of Site :	
Name of Sub-Contractor :	
Date of Inspection :	

Item	**Nos. Deployed**	**Identification Numbers (1 on each line)**	**Whether Tested by competent person**	**Validity of Test Certificates**	**Whether internal testing using Color Coding or similar system done**
Winches					
Chain Blocks					
Wire Rope Slings					
Man Cages					
D-Shackles					
Air Compressors					
Crawler Cranes					
Mobile Cranes					
Hydra Cranes					
Others					

Signature of Site I/C of Subcontractor: **Date:**

	POWER SECTOR	FORMAT NO: **HSEP:13-F09A** REV NO.: 00 PAGE NO. 01 OF 01
	Inspection Of Cranes	

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection:	

Crane Reg. No(Make/Model) _____

Name of Driver/Operator _____

Sl.no.	Description	Observation	Measures
1	Valid Driving license		
2	Hook & Hook Latch		
3	Over Hoist limit switch		
4	Boom limit switch		
5	Boom Angle Indicator		
6	Boom limit cutoff switch		
7	Condition of Boom		
8	Condition of ropes		
9	Number of load lines		
10	Size and condition of the slings		
11	Stability of the cranes		
12	Soil Condition		
13	Swing Break And Lock		
14	Proper Break And Lock		
15	Hoist Break And Lock		
16	Boom Break And Lock		
17	Main Clutch		
18	Leakage in Hydraulic Cylinders		
19	Out riggers filly extendable		
20	Tyre pressure		
21	Condition of Battery And Lamps		
22	Guards of moving and rotating parts		
23	Load chart provided		
24	Number and position of pedant ropes		
25	Reverse Horn		
26	Load Test Details		
27	Operator's fitness		
28	Pollution under control certificate		
29	Fire extinguisher of appropriate type.		
30	Training of the operator		

Signature of Site I/C of Subcontractor: **Date:**

	POWER SECTOR	FORMAT NO: **HSEP:13-F09B** REV NO.: 00 PAGE NO. 01 OF 01
	Inspection Of Winches	

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection:	

Winch Reg. No(Make/Model) _____

Name of Operator _____

Sl. No.	Description	YES	NO	NA	Remarks
1	Has the copy of Third Party Inspection certificate been provided in winch machine shed?				
2	Is winch machine operator experienced enough to operate the winch machine?				
3	Is the winch machine operated by someone other than the winch machine operator?				
4	Is there guard provided in all moving parts like wheel and motor's shaft?				
5	Will it protect against unforeseen operational contingencies?				
6	Are brakes, clutch and locking arrangement working properly?				
7	Has it been ensured that the guard does not constitute a hazard by itself?				
8	Are the cranks and the connecting rods protected by guardrails?				
9	Is there provision for fully covered shed with wooden plank roof?				
10	Is wire rope free from any kind of damage or wear and tear?				
11	Is split pin provided for the protection of clutch and brake locking arrangement?				
12	Is pulley inspected by competent person and certified before use?				
13	Is pulley free from any wear and tear visually?				
14	Is winch rope barricaded with clipsheet for the protection of rope and person?				
15	Is the wire rope lubricated by cardium oil?				
16	Is there any friction in wire rope which may damage the wire rope rather than the rolling parts?				
17	Is there any oil leakage in the hydraulic system of the winch machine?				
18	Has it been ensured that the guard will not cause discomfort or inconvenience to operator?				

Total NO		**Total NA**		**% Compliance**	

Signature of Site I/C of Subcontractor: **Date:**

	POWER SECTOR	FORMAT NO: **HSEP:13-F10** REV NO.: 01 PAGE NO. 01 OF 2
	Inspection of Height Working	

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection:	

Sl. No.	Descriptions	Observation (Yes/No)	Remarks
1	All the workers have been explained safe work method?		
2	An established communication system has been established and explained to the workers.		
3	Adequate illumination has been ensured.		
4	Work area inspected prior to the start of the work.		
5	Is the work area barricaded to prevent fall and platforms are of adequate strength (bamboo, jute / plastic ropes not to be used).		
6	The temporary work platforms& structures for height work including those used in Boiler structures, water walls, ESP, Powerhouse are fully barricaded with railings (as per **IS 3696**)		
7	Fabricated makeshift arrangements are checked for quality and type of material welding, anchoring etc.		
8	Are floor gaps, permanently covered and barricaded		
9	Area below the work place barricaded, particularly below hot work.		
10	Workers provided with bags /box to carry bolts, nuts and hand tools		
11	Arrangement for fastening hand tools made.		
12	All work platforms ensured to be of adequate strength and ergonomically suitable.		
13	Work at more than one elevation at the same segment is restricted.		
	Access/Egress		
1	Walkways provided with handrail, mid-rail and toe guard?		
2	All checkered plates, gratings properly welded/ bolted?		
3	Are ladders inspected and they are in good condition?		
4	Are ladders spliced?		
5	Are ladders properly secured to prevent slipping, sliding or falling?		
6	Do side rails extend 36” above top landing?		

	POWER SECTOR	FORMAT NO: **HSEP:13-F10** REV NO.: 01 PAGE NO. 02 OF 2
	Inspection of Height Working	

Sl. No.	Descriptions	Observation (Yes/No)	Remarks
7	Are built up ladders constructed of sound materials?		
8	Are rugs and cleats not over 12" on center?		
9	Metal ladders not used around electrical hazards.		
10	Proper maintenance and storage.		
11	Ladders placed at right slope.		
12	Ladders / staircases welded/ bolted properly.		
13	Any obstruction in the stairs.		
14	Are landing provided with handrails, knee rails, toe boards etc.?		
15	Whether ramp is provided with proper slope.		
16	Proper hand rails / guards provided in ramps.		
	Housekeeping		
1	Walkways, aisles & all overhead workplaces cleared of loose material.		
2	Flammable materials, if any, are cleared.		
3	All the de shuttering materials are removed after de shuttering is done.		
4	Platforms and walkways free from oil/grease or other slippery material.		
5	Collected scrap are brought down or lowered down and not dropped from height.		
	PPE And Safety Devices		
1	Use of safety helmet, safety belts ensured for all workers		
2	Anchoring points provided at all places of work.		
3	Common lifeline provided wherever linear movement at height is required.		
4	Safety nets are use wherever required.		
5	Proper fall arrest system is deployed at critical workplaces.		
6	Crawler boards/Safety system or works on fragile roof are used.		

Signature of Site I/C of Subcontractor: **Date:**

	POWER SECTOR	FORMAT NO: **HSEP:13-F11** REV NO.: 01 PAGE NO. 01 OF 02
	Inspection of Welding and Gas Cutting	

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection :	

Welding				
Sl.no.	Description	Yes	No	Remarks
1	Is electric connection given through 30 mA ELCB/RCCB to welding m/c?			
2	Is electric cable fitted properly in junction box on m/c?			
3	Is electrical cable free from joints?			
4	Are the joints attached firmly &insulated with tape?			
5	Is double earthing given to body of m/c?			
6	Is the physical condition of the m/c good?			
7	Is ON/OFF switch connected to the m/c is working and in good condition?			
8	Are indication lamps on m/c working?			
9	Is the electrode holder in good condition?			
10	Are the cables of the welding m/clugged & tight properly?			
11	Are return lead connected properly (Rod, Angle, Channels shall not be used)			
	Total No of NO			
	Total No of YES			

	POWER SECTOR	FORMAT NO: **HSEP:13-F11** REV NO.: 00 PAGE NO. 02 OF 02
BHEL	Inspection of Welding and Gas Cutting	

Gas Cutting				
Sl.no	Description	Yes	No	Remarks
1	Are Cylinders kept on trolleys?			
2	Physical condition of Gas cylinders Good?			
3	Is there Oil/Grease on valve of the cylinder?			
4	Are pressure regulators in good condition?			
5	Condition of hose pipe OK?			
6	Are hose pipe clamped with hose clip?			
7	Is flash back arrestor & NRV fitted on torch both for O2 and LPG cylinder?			
8	Is nozzle of the torch cleaned?			
	Total Number of NO			
	Total No of YES			
	% Compliance			

Signature of Site I/C of Subcontractor: **Date:**

	POWER SECTOR **Inspection Of Electrical Installations**	FORMAT NO: **HSEP:13-F12** REV NO.: 00 PAGE NO. 01 OF 02

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection :	

Sr. No.	**Contents**	**Yes/No**	**Remarks**
A	**Cable**		
1.	Whether the condition of cable is checked?		
2.	Are cables received from other sites checked for insulation resistance before putting them into use?		
3.	Are all main cables taken either underground /overhead?		
4.	Are welding cables routed properly above the ground?		
5.	Are welding and electrical cables overlapping?		
6.	Is any improper joining of cables/wires prevailing at site?		
B	**DBs/SDBs**		
1.	Is earth conductor continued up to DB / SDB?		
2.	Whether DBs and extension boards are protected from rain / water?		
3.	Is there any overloading of DBs / SDBs?		
4.	Are correct / proper fuses & CBs provided at main boards and sub-boards?		
5.	Is energized wiring in junction boxes, CB panels & similar places covered all times?		
C	**ELCB**		
1.	Whether the connections are routed through ELCB?		
2.	Is ELCB sensitivity maintained at 30 mA?		

	POWER SECTOR **INSPECTION OF ELECTRICAL INSTALLATION**	FORMAT NO: HSEP:13-F12 REV NO.: 00 PAGE NO. 02 OF 02

Sr. No.	Contents	Yes/No	Remarks
3.	Are the ELCB numbered and tested periodically & test results recorded in a logbook countersigned by a competent person?		
D	**Grounding**		
1.	Is natural earthing ensured at the source of power (main DB at Generator or Transformer)?		
2.	Whether the continuity and tightness of the earth conductor are checked?		
3.	Mention the gauge of the earth conductor used at the site.		
4.	Mention the value of Earth Resistance.		
E	**Electrically operated Machines or Accessories**.		
1.	Whether the plug top is provided everywhere.		
2.	Are all metal parts of electrical equipment and light fittings / accessories grounded?		
3.	Is there any shed or cover for welding machines?		
4.	Are halogen lamps fixed at proper places?		
5.	Are portable power tools maintained as per norms?		
6.	Any other information:		

Signature of Site I/C of Subcontractor: **Date:**

	POWER SECTOR **Inspection of Elevator**	FORMAT NO: **HSEP:13-F13** REV NO.: 00 PAGE NO. 01 OF 01

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection :	

Sr. No.	**Description**		**Remarks**
1.0	Name of equipment		
2.0	Basic Information of equipment		
2.1	Specification		
2.2	Sr. No. of equipment		
2.3	Make		
2.4	Year of manufacture		
3.0	Major repairs/overhauls(Furnish details of work carried out)		Date(s) of major repair/overhaul
3.1			
3.2			
3.3	Repairs carried out at site		
4.0	Any performance test conducted	Yes/No	
5.0	Document Submitted	Yes/No	
6.0	Manufacturer's test / guarantee certificate	Available/ Not available	
7.0	Performance test	Done/ Not Done	
8.0	Acceptance Norms		
9.0	Committee Observations		
10.0	Date of next review (if accepted)		

Signature-Subcontractor/ Subcontractor's Safety Officer	**Signature-Site Safety Officer (BHEL)**

	POWER SECTOR **HSE Penalty Format**	FORMAT NO: **HSEP:14-F14** REV NO.: 00 PAGE NO. 01 OF 2

Sub: MEMO for Penalty for non-compliances in Safety and Fabrication Quality requirement

Following lapse (tick marked) was observed and penalty is imposed as stated at the bottom of this memo. It is requested that such occurrences may please be avoided in future.

S. No	Nature of Non - Compliance	Penalty (in Rs.)	Remarks
	A. PPEs		
1.	Not wearing safety helmet / wearing without chin straps	500	Per Person/ day
2.	Not Wearing safety shoes	500	Per Person/ day
3.	Not wearing gloves, nose masks where required	350	Per Person/ day
4.	Not using grinding goggles while doing grinding operations	500	Per Person/ day
5.	Not wearing Reflective Vest with company LOGO	350	Per Person/ day
6.	Not wearing safety goggles	350	Per Person/ day
7.	HV arc flash suit with protective hood	2500	Per Person/ day
8.	LV arc flash jacket	1000	Per Person/ day
9.	Electrical Hand gloves for voltage work >260 V and <=690(LV)	500	Per Person/ day
10.	Electrical safety over shoe (for Electrical work)	500	Per Person/ day
	B. Height Work		
1.	Not providing Lifelines for height work	1000	Per location per day
2.	Not ensuring barricading of working platforms	1000	Per location per day
3.	Not using temporary platform during work at height	1000	Per case per day
4.	Not wearing safety belt while working at height (> 2 meters) or not anchoring to lifeline	2000	Per Person/ day
5.	Not providing proper barricades (caution tape at 2 elevations)	500	Per location per day
6.	Use of mobile phones by Height worker / Crane / Hydra Operator	1000	Per case per day
	C. Electrical		
1.	Not using 24 V supply for lighting in confined spaces	500	Per case per day
2.	Lack of Electrical Earthing	2000	Per case per day
3.	Improper earthing of welding & Other electrical Machines. Earth resistance not OK	500	Per Machine per incidence
4.	Electrical plug not used for connection/ hand machines	500	Per connection per incidence
5.	Unsafe electrical practice like not installing ELCB/ RCCB	500	Per case per day
6.	Using frayed/ broken welding cables	500	Per machine per week
7.	Non deployment of valid licensed electrician for LV & HV work as per IER	5000	Per Person/ day
	D. Lifting		
1.	Use of lifting equipment without having valid Third Party Test certificate	5000	Per equipment per seven days
2.	Lifting hooks without latches	500	Per hook per day
3.	Using damaged slings or not slinging properly	2000	Per event Per T&P
4.	Lifting cylinders without cage or rolling of cylinders	500	Per Event per incidence
5.	Non removal of scrap from platforms	1000	Per Event Per location per 7 days
	E. Hot Work / Cylinder Handling		
1.	Gas cutting without flash back arrestor	2000	Per machine per incidence
2.	Gas cutting at height without sheet below	500	Per event
3.	Not keeping gas cylinders vertically / in trolley on ground	500	Per event
4.	Gas cutting with damaged hose pipes	500	Per event
5.	Not covering welding cylinder with top cover	500	Per event

	POWER SECTOR	FORMAT NO: **HSEP:14-F14** REV NO.: 00 PAGE NO. 02 OF 2
	HSE Penalty Format	

	Nature of Non - Compliance	Penalty in Rs.)	Remarks
	F. Construction Vehicles		
24.	Not having valid driving license for the type of vehicle/ T&P	2000	Per driver per event
25.	Two wheeler entry in construction area	500	Per vehicle
26.	Using Hydra for material movement at site in unsafe manner	1000	Per case
27.	Using Two Hydra in Tandem for material movement	2000	Per case
28.	Vehicles, Hydras, Cranes, Dumpers and Earth Movers not having automatic back horns linked to gear	1000	Per Equipment per day
29.	Not using guide rope while moving material using Hydra or Cranes	1000	Per event
30.	Violating speed limit during vehicle movement	1000	Per event
	Engineering / Administrative Controls / General		
31.	Major Accident – Victim not reporting for work within 48 hours – resulting in partial loss in earning capacity & termination / demotion in employment	200000	Per victim
32.	Fatal Accident/Accidents Resulting in total Loss in Earning Capacity #	500000	Per victim#
33.	Unsafe Act in violation of standards / clauses of this document	500-5000	Per case
34.	Activity carried out without safety work permit where applicable	2000	Per person per event
35.	Using untrained / unqualified personnel for hazardous work	2000	Per event
36.	Not maintaining proper hygiene in canteen as per BOCW	1000	Per event

 # or as deducted by customer, whichever is higher.

For repeated **major and** fatal incidents under the same subcontractor for the same package in the same Unit, the subcontractor will pay 2 times the penalty compared to previously paid

Details (if any) related to non- compliance (Name of persons, Nature of deficiency, etc.)

Penalty imposed: _____

1, Rate as per above chart_____

2. No. of Persons/ machine/ event/ labor_____

3. Total Penalty= 1. X 2. =_____

BHEL Personnel:

Signatures:

Name_____

Attachments: Photographs & Documentary proof (if available) for violation

Distribution: 1 Copy: to Sub- Contractor Site In-charge,
1 Copy to Site Construction Manager (BHEL)

	POWER SECTOR	FORMAT NO: **HSEP:13-F15**
	Format for Initial Verification of PPE's& Lifting Tools & Tackles	REV NO.: 00 PAGE NO. 01 OF 1

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection :	

S. No	Particulars (Serial Number, make, model of PPE, T&P)	Accepted / Rejected	Remarks
	Checked (Name & Sign. Of Subcontractor)	**Verified (Name & Sign. Of BHEL HSE Officer)**	

BHEL	**POWER SECTOR** **Format for Inspection of Labor Colony**	FORMAT NO: **HSEP:13-F16** REV NO.: 00 PAGE NO. 01 OF 1

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection :	

S. No	Particulars	No	Yes	Comments
1	Sufficient living space ensured for each occupant with Kitchen area			
2	Area cleanliness ensured through regular cleaning			
3	Toilet facility sufficient for all occupants available, in order with adequate lighting, cleaned regularly and in hygienic condition			
4	Washing facilities available with adequate water supply			
5	Availability of sufficient drinking water in protected tanks with weekly tank cleaning and source tested annually as per IS10500 ensured			
6	Adequate drainage to remove waste and rain water, no flooding			
7	"Unsafe for Drinking" posted near accessible non-potable water and sources; posted in language of occupants or universal symbol			
8	Prevention of mosquitoes, flies, and rodents in immediate housing area through insecticide sprays if required			
9	Electricity provided& electrical connections safety ensured			
10	Fans, Coolers / Quilts, Heaters provided as required to cater to weather conditions along with adequate electricity supply			
11	Houses Walls and roof tight and solid; floors rigid and durable, with smooth, cleanable finish in good repair			
12	Availability of nominal rate ration / common use items shop within / nearby the colony			
13	Emergency medical plan developed: (A) Potential injuries determined (B) Local EMS response determined (C) Qualified first-aid person on site, if required			
14	Emergency plans posted where employees gather			
15	Transportation to nearest suitable facility			
Any other checks:				
Remarks:		**Name & Sign. Of HSE Officer**		

	POWER SECTOR	FORMAT NO: **HSEP:13-F17**
	Format for Recording of First Aid Injuries	REV NO.: 00 PAGE NO. 01 OF 1

Name of Site:

Date:	Time:	Name of patient:	Subcontractor	Description of injury:	How the injury occurred:	Treatment provided:	First Aider Name:	Initials:	Reportable: Yes/No

	POWER SECTOR	FORMAT NO: **HSEP:13-F18**
	Format for Register of Issue and Receipt of PPEs	REV NO.: 00 PAGE NO. 01 OF 1

Site:

Subcontractor:

S.N	Name of Person	Details of PPE(s) Issued (with Serial Numbers, if available)	Date Issued	Receiver's Signature	Issuer's Name & Designation	PPE's verified OK	Issuer's Signature

BHEL	**POWER SECTOR** **Format for Maintaining Records of E-waste Handled / Generated**	FORMAT NO: **HSEP:13-F19** REV NO.: 00 PAGE NO. 01 OF 1

(Generated Quantity in Metric Tonnes (MT) per year)

Site		
Subcontractor		
Date		
Types & Quantity of e-waste handled/generated**	Category	Quantity
	Item Description	
Types & Quantity of e-waste stored	Category	Quantity
	Item Description	
Types & Quantity of e-waste sent to collection center authorized by producer/dismantler/recycler/refurbisher or authorized dismantler/ recycler or refurbisher **	Category	Quantity
	Item Description	
Types & Quantity of e-waste transported*	Category	Quantity
	Item Description	
Name, address and contact details of the destination		
Types & Quantity of e-waste refurbished*	Category	Quantity
	Item Description	
Name, address and contact details of the destination of refurbished materials		
Types & Quantity of e-waste dismantled*	Category	Quantity
Name, address and contact details of the destination	Item Description	
Types & Quantity of e-waste recycled*	Category	Quantity
Types & Quantity of materials recovered	Item Description	
	Quantity	
Name, address and contact details of the destination		
Types & Quantity of e-waste sent to recyclers by dismantlers	Category	Quantity
	Item Description	
Name, address and contact details of the destination		
Types and Quantity of other waste sent to respective recyclers by dismantlers / recyclers of e-waste	Category	Quantity
Name, address and contact details of the destination	Item Description	
Types and Quantity of e-waste treated & disposed	Category	Quantity
	Item Description	
Name, address and contact details of the destination		

Signature of Subcontractor: Date

	POWER SECTOR **Format for Maintaining Records of Hazardous Waste at the Facility**	FORMAT NO: **HSEP:13-F20** REV NO.: 00 PAGE NO. 01 OF 1

1. Name of Site:
2. Name of the Subcontractor:
3. Date:
4. Description of hazardous waste:

Physical form with description	Chemical form	Total volume and weight (in kg.)

5. Description of storage and treatment of hazardous waste:

Date	Method of storage of hazardous wastes	Date	lethod of treatment of hazardous wastes

6. Details of transportation of hazardous waste:

Name & address of consignee of package	Mode of packing/of the waste for transportation	Mode of transportation to site of disposal	Date of transportation

7. Details of disposal of hazardous waste:

Date of disposal	Concentration of hazardous material in the final waste form	Site of disposal (identify the location on the relevant layout drawing for reference)	Method of disposal	Persons involved in disposal

8. Data of environmental surveillance:

Date of measurement	Analysis of ground water			Analysis of soil samples			Analysis of air sampling			Analysis of any other samples (give details)
	Location of sampling	Depth of sampling	Data	Location of sampling	Depth of sampling	Data	Location of sampling	Data		

9. Details of the hazardous wastes reused and recycled:

Date	Total quantity of hazardous waste generated	Details of hazardous waste minimization activity	Material received	Final quantity of waste generated	Net reduction in waste generation quantity and percentage

Signature of Subcontractor: Date:

	POWER SECTOR	FORMAT NO: **HSEP:13-F21**
	HSE Checklist-cum-Compliance Report	REV NO.: 00 PAGE NO. 01 OF 3

PROJECT:_____ CONTRACTOR:

_____DATE:_

OWNER :_____ INSPECTION BY:_____

_____

Note : write 'NA' wherever the items is not applicable

Item	Yes	No	Remarks	Action
HOUSEKEEPING				
Waste containers provided and used				
Passageways and walkways clear				
General neatness of working area				
Other				
PERSONNEL PROTECTIVE EQUIPTMENT				
Goggles; shields				
Face protection				
Hearing protection				
Respiratory masks etc.				
Safety belts				
Other				
EXCAVATIONS / OPENINGS				
Openings properly covered or barricaded				
Excavations shored				
Excavations barricaded				
Overnight lighting provided				
Other				
WELDING, CUTTING				
Gas cylinders chained upright				
Cable and hoses not obstructing				
Fire extinguisher (s) accessible				
Others				
SCAFFOLDING				
Fully decked platforms				
Guard and intermediate rails in place				
Toe boards in place				
Adequate shoring				
Adequate access				
Others				
LADDER				
Extension side rails 1 m above				
Top of landing				
Properly secured				
Angle + 70^0 from horizontal				
Other				

	POWER SECTOR HSE Checklist-cum-Compliance Report	FORMAT NO: **HSEP:13-F21** REV NO.: 00 PAGE NO. 02 OF 3

HOISTS, CRANES AND DERRICKS				
Condition of cables and sheaf OK				
Condition of slings, chains, hooks OK				
Inspection & maintenance log maintained				
Outriggers used				
Signals observed and understood				
Qualified operators				
Others				
MACHINERY, TOOLS & EQUIPMENT				
Proper instruction				
Safety devices				
Proper cords				
Inspection and maintenance				
Other				
VEHICLE AND TRAFFIC				
Rules and regulations observed				
Inspection and maintenance				
Licensed drivers				
Other				
TEMPORARY FACILITIES				
Emergency instructions posted				
Fire extinguishers provided				
Fire-aid equipment available				
General neatness				
Others				
FIRE PREVENTION				
Personnel instructed				
Fire extinguishers checked				
No smoking in prohibited areas.				
Hydrants				
Clearance				
Others				
ELECTRICAL				
Proper wiring				
ELCB’s provided				
Ground fault circuit interrupters				
Protection against damage				
Prevention of tripping hazards				
Other				
HANDLING & STORAGE OF MATERIALS				
Properly stored or stacked				
Passageways clear				
Other				
FLAMMABLE GASES AND LIQUIDS				
Containers clearly identified				
Proper storage				
Fire extinguisher nearby				
Other				

	POWER SECTOR	FORMAT NO: **HSEP:13-F21**
	HSE Checklist-cum-Compliance Report	REV NO.: 00 PAGE NO. 03 OF 3

WORKING AT HEIGHT				
Safety nets				
Safety belts				
Safety helmets				
Anchoring of safety belt to the life line rope				
ENVIRONMENT				
Lubricant waste/engine oils properly dispose.				
Waste from Canteen, offices, sanitation etc. disposed properly.				
Disposal of surplus earth, stripping materials, expired batteries, oily rag sand combustible materials done properly.				
HEALTH CHECKS				
Hygienic conditions at labor camps O.K.				
Availability of first-aid facilities				
Proper sanitation at site, office & labor camps.				
Arrangement of medical facilities.				
Measures for dealing with illness.				
Availability of potable drinking water for workmen & staff.				
Provision of crèches for children.				

Signature of Subcontractor: Date:

	POWER SECTOR - HQ	
BHEL	**Initial Incident Report** **Near Miss / Minor Incident**	FORMAT NO.: HSEP:08-F01 REV NO.: 00

1. Incident Details:

Sl. No	Item	Information	Sl. No	Item	Information
1	Place of Incident		8	IP's Name	
2	Exact location		9	IP Date of Birth	
3	Date & Time		10	Injury Details	
4	Main EPC		11	Body Part Injured	
5	Sub-Contractor if any		12	IP's Gate Pass No.	
6	Job Sup. Name	MR. XXXXXXXXXXX	13	Name of Witness	
7	Date of Joining Duty		14		

2. Classification of Incident:

3. Activity Type:

Height Work		Hot work		Machine Guarding	
Excavation		Confined Space		Vehicle Movement	
Scaffolding		Electrical		Construction Equipment	
Hoist & Rigging		Portable & Power Hand Tools		Housekeeping	
Material Handling		Environmental Spill		Painting	
Insulation		Hydro test		Commissioning	

Incident Description:

Immediate Action Taken: Immediately higher elevation work stopped (Example).

Immediate causes: Loose material or poor material handling suspected (Example).

Action Taken to Correct:

Name of the reporting Person:

Date:

बी एच ई एल BHEL	**POWER SECTOR - HQ** **Preliminary Incident Report to HQ (Fatal / Major / Fire)**	FORMAT NO.: HSEP:08-F02 REV NO.: 00 Page 1 of 2

Type of incident: Fatal/Major//Fire/Property damage (Tick what is applicable)

1	NAME OF SITE		3	ACTIVITY AREA	
2	SCOPE OF WORK		4	NAME OF CONTRACTOR	
			5	NAME & DESIGNATION OF BHEL ACTIVITY I/C	
6	DATE & TIME OF ACCIDENT		7	DATE RESUMED	
8	NO. OF WORK-DAYS LOST BY VICTIM (If duty not resumed, give estimated figure)				
9	NO. OF MANHOURS LOST BY OTHERS				
10	PERSONAL DETAILS OF INJURED AND/OR DETAILS OF MATERIALS/EQUIPMENT/ PROPERTY DAMAGED				

NAME				NAME OF MATERIAL / EQUIPMENT / PROPERTY	
PERIOD OF EMPLOYMENT					
AGE	YRS	SEX	MALE/FEMALE	ESTIMATED COST	ACTUAL COST
MARITAL STATUS		SINGLE/ MARRIED			
OCCUPATION				NATURE OF DAMAGE	
PART OF BODY INJURED					
NATURE OF INJURY					
AGENCY (OBJECT / EQUIPMENT / SUBSTANCE) MOST RESPONSIBLE FOR CAUSING ACCIDENT / INJURY / DAMAGE					
12	PERSON (NAME & DESIGNATION) WITH MOST CONTROL OVER AGENCY (OBJECT / EQUIPMENT / SUBSTANCE) CAUSING ACCIDENT INJURY / DAMAGE				
13	DESCRIBE CLEARLY HOW THE ACCIDENT OCCURRED (USE ADDITIONAL SHEET, IF REQUIRED)				

	POWER SECTOR - HQ	FORMAT NO.: HSEP:08-F02 REV NO.: 00 Page 2 of 2
	Preliminary Incident Report to HQ (Fatal / Major / Fire)	

ANALYSIS		
14	**WHAT ACTS AND/OR CONDITIONS CONTRIBUTED MOST DIRECTLYTO THIS ACCIDENT**	
15	**WHAT ARE THE BASIC REASON FOR THE EXISTENCE OF THESE ACTS AND/OR CONDITION?**	
16	**WHAT CORRECTIVE ACTIONS HAVE BEEN TAKEN TO PREVENT ACCEDENT RECURRENCE?**	
	DATE:	**SIGNATURE OF SITE HSE COORDINATOR**
17	**COMMENTS OF HEAD/SOX**	
	DATE:	**SIGNATURE OF HEAD/SOX**

Monthly HSE Planning & Review Format

(Based on Contractual Requirements & BHEL Systems)

Health, Safety & Environment

Power Sector Headquarters

Format No. HSEP13: F30
Rev. 00

Name of Project		Name of Agency		Approx. No. of Workers	
Scope of Work		Date			

PART- A: PLAN OF HSE ACTIVITIES FOR THE MONTH OF February, 2020	PART-B: REVIEW ON .....

(Note: Form to be filled in soft copy. Add additional sheets as per requirement; All Formats as per HSEP14 except Excavation Format, which is supplied separately/ available on BHEL intranet portal. Filled Formats/ Records to be submitted by Agency at the end of each month along with Review as mentioned below)

SN.	Description of HSE Activity& Formats	Plan & Targets for the month	Review
1	Availability of First Aid Box at Required Places and Inspection thereof as per Format: F01 (Submit separate Format for each First Aid Box)	Areas	
2	Health check-up as per Format: F02	**Health check-up for** **Nos** 1. New inductees 2. Drivers & Operators Workers in following high risk areas:	
3	Induction training of newly joined workers as per Format: F03	Minimum No. of workers:	
4	Daily Toolbox talks (TBT) conducted before start of work as per Format: F04	Locations of TBTs & Approx. No. of workers	
5	PPE usage and issue as per Format: F06		
6	Inspection of T&Ps as per Format: F07 (Ensure Master T&P List is available)	List of T&Ps to be inspected	
7	Identification & Inspection Status of T&Ps as per Format: F08 (Ensure Master T&P List is available)		
8	Inspection of Cranes & Winches as per Format: F09 (Ensure Master T&P List is available)	Serial Numbers of Cranes & Winches to be tested	

Monthly HSE Planning & Review Format

(Based on Contractual Requirements & BHEL Systems)

Health, Safety & Environment

Power Sector Headquarters

Format No. HSEP13: F30
Rev. 00

9	Inspection of Height Working as per Format: F10 (Submit separate format for each location)	Areas:	
10	Inspection of Welding & Gas Cutting operations as per Format: F11 (Submit separate format for each location)	Areas:	
11	Inspection of Electrical Installations as per Format: F12 (Submit separate format for each location)	Locations:	
12	Inspection of Elevators (as applicable) as per Format: F13 (Submit separate format for each location)	Locations:	
13	Inspection of Excavation as per Format: F13E (Submit separate format for each location)	Locations:	
14	Job Safety Analysis (JSA) as per Format (HSEP13:F32B) Development of Operational Control Procedures (OCP)	JSA Activities: OCP Activities	
15	Regular Job Specific Training (Re-training) for workers involved in hazardous activities (Training calendar to be prepared by Agency and Audio-visual training to be ensured)	Topics/ Hazards, Dates & No. of workers	
16	Mass housekeeping (HK) drive in work areas	Areas with Dates	
17	Vertigo Test of Height workers	Minimum No. of workers:	
18	Deployment of qualified HSE Officers as per contract (Ensure Roster for HSE Staff is available)	Location(s) & Nos.	
19	Deployment of qualified HSE Stewards as per contract (Ensure Roster for HSE Staff is available)	Location(s) & Nos.	

Monthly HSE Planning & Review Format

(Based on Contractual Requirements & BHEL Systems)

Health, Safety & Environment

Power Sector Headquarters

Format No. HSEP13: F30

Rev. 00

20	Deployment of Safety tools & Equipment (Safety Nets, Lifelines, Fall arrestors, Man-cages, flashback arrestors, scaffolding etc.) (Ensure Test Certificates are available and equipment conform to relevant Indian Standards)	Tool/ Equipment, Numbers & Location	
21	Safety Walks by site in charge of agency (4 - Weekly once) (Submit Photos/ Records)	Dates:	
22	Safety walks by departmental head (8-Weekly twice) (Submit Photos/ Records)	Dates:	
23	Availability/ deployment of Safety posters/ placards/ signage at strategic locations	Locations: Content & Nos.	
24	Provision of clean drinking water sources for workers (Ensure testing as per IS10500)	Locations: Nos.	
25	Provision of toilets for workers (separate for male & female workers)	Locations: Nos.	
26	Rest sheds for workers during lunchtime, rain, dust storm etc.	Locations: Capacity & Nos.	
27	Availability of following in Labor colony (check whichever is applicable)	1. Clean drinking water 2. Toilets 3. Cleanliness & Hygiene 4. Grass cutting, 5. Fogging 6. Electrical Inspection	

Monthly HSE Planning & Review Format

(Based on Contractual Requirements & BHEL Systems)

Health, Safety & Environment

Power Sector Headquarters

Format No. HSEP13: F30
Rev. 00

28	Availability of dust/ waste bins at various locations	Locations:	
29	Availability of Ambulance (individual/ joint) in each shift	Ambulance Nos. & locations	
30	Availability of emergency vehicle in each shift	Emergency vehicle nos. & locations	
31	Deployment/ Availability of tested Fire Extinguishers	Locations, Types & Nos.	
32	Tree plantation	Locations & Nos.	
33	Waste disposal & Scrap Bins	Locations & Details/ Nos.	
34	Illumination checks using Lux Meter (Submit Report with Serial No. of Lux Meter)	Locations:	
35	Safety award function: 1. Display of good practices 2. Award presentation	Dates:	
36	Submission of Daily Reports as per Format No. HSEP13:F31A	Nos planned:	

PLAN		**REVIEW**	
Agency HSE Name: Sign: Date:	**BHEL HSE** Name: Sign: Date:	**Agency HSE** Name: Sign: Date:	**BHEL HSE** Name: Sign: Date:

BHEL	Daily HSE Report (Agency) Health, Safety & Environment Power Sector Headquarters	Format No. HSEP13:F31A Rev. 00

DAY		MONTH		YEAR	

PROJECT		AGENCY	

Important:

1. N-Night Shift

2. Photographs of inspection of height work, hazardous activities, T&Ps,Toolbox Talks, Training, Reward Function, Housekeeping/ Plantation drives etc. to be attached

4. Report to be compiled daily at day end and submitted to BHEL

5. Format to be preferably used in soft copy only and submitted by e-mail

General Info			Manpower Details				Safety Statistics												Incident Statistics						NCs	
SHIFT	Submitted By	Work Area(s)	Staff	Man-Power	Safety Officers	Safety Stewards	Tool Box (Topics and No. of Participants)	Induction Training (No. of Participants)	Vertigo Test (Numbers Tested)	On-the-Job Training (Topic & participants)	Work Permits	Job Safety Analyses conducted	Height Work Inspection	Other Hazardous Activities Inspection	T&P Inspection (Names & Nos. Inspected)	Safety Walk (Designation, Areas)	HSE Meeting	Safety Reward (Details)	Housekeeping/ Dust Suppression/ Tree Plantation Activities (Locations/ Details)	Lost time Accident	Restricted Work Case	Medical Treatment Case	First Aid Case	Near miss	Property Damage/ Fire	Non-Compliances Submitted by BHEL	Complied by Agency
DAY																										
NIGHT								NA	NA	NA					NA		NA	NA	NA							

Method Statement Format

Health, Safety & Environment

Power Sector Headquarters

Format No. HSEP13:F32A

Rev. 00

	PROJECT:	**Coastal Gujarat Power Limited, Mundra**		
	METHOD STATEMENT TITLE :			
	NAME OF THE SUB-CONTRACTOR			
	METHOD STATEMENT SL NO		DATE	
	Revision No		Issued by	
	LOCATION			
1.	**INTRODUCTION**			
2.	**PURPOSE**			
3.	**SCOPE**			
4.	**ABBREVIATIONS & DEFINITIONS**			
5.	**PROCEDURE**			
6	**Equipment and safety requirements**			
	DESCRIPTION	**CAPACITY**	**QTY.**	**REMARKS**
7.0	**Safety Precautions**			
7.1	**PPE Required**			
7.2	**Do's & Don's**			
7.3	**JSA /HIRA (Attach)**			

	Prepared by (Agency Execution)	Reviewed by (BHEL Execution)	Approved by (BHEL Execution)
(Name)			
(Signature)			
(Date)			

Job Safety Analysis Format

Health, Safety & Environment

Power Sector Headquarters

Format No. HSEP13:F32B

Rev. 00

Hazard Identification & Risk Assessment and Control Measure Worksheet (HIRA) for the Job						
JOB TITLE :				FORMAT NO:		
TEAM MEMBER:				REV:		
NAME OF THE SUB-CONTRACTOR		AREA :				

HAZARDS	PRECAUTIONS

(Name)	Submitted By (Agency HSE)		Reviewed By (BHEL Execution)		Approved By (BHEL HSE)	
(Sign)						
(Date)						

Vendor HSE Performance Evaluation Checklist

Health, Safety & Environment

Power Sector Headquarters

Format No. HSEP13:F33
Rev. 00

Project	Enter Project Name Here		Enter Name of			Enter Package/Unit Name Here
SL	Parameter for Measurement	Mandatory/ Optional	0	5	Max Score	Supporting Documents
1a	Induction training for new workers conducted through audio-visual medium & documented ?	**Mandatory**	No	Yes	1	Induction Training Records
1b	Tool box talk conducted regularly as per plan, and documented?	**Mandatory**	No	Yes	1	Toolbox Talk Records
1c	Contractor in charge and safety in charge attended safety meetings?	**Mandatory**	No	Yes	2	Minutes of Meeting
1d	Whether observations in safety meetings are complied before next meeting?	**Mandatory**	No	Yes	2	-do-
1e	Preparation and submission of Monthly HSE report within stipulated time	**Mandatory**	No	Yes	1	Report submission date
1f	Preparation and submission of Incident/near-miss report and RCA Report (as applicable) within stipulated time	**Mandatory**	No	Yes	1	Incident/ Near Miss Records
1g	Carrying out Inspections and submission of Inspection reports within stipulated time	**Mandatory**	No	Yes	1	Inspection Records
1h	Regular Job Specific Training ensured for High Risk Workers (through audio-visual medium) as per plan	**Mandatory**	No	Yes	1	Training & Attendance Records
2a	Whether the contractor is registered under BOCW	**Mandatory**	No	Yes	2	BOCW Registration Certificate
2b	Availablity of Qualified safety officer (1 for every 500 labour)	**Mandatory**	No	Yes	2	Safety Officer qualification & experience records
2c	Availablity of Qualified safety supervisor (1 for every 100 labour)	**Mandatory**	No	Yes	2	Safety Officer qualification & experience records
2d	All the workers are provided and using safety helmets and safety shoes/gum boots	**Mandatory**	No	Yes	2	PPE Issue Records, Inspection/ non-conformity records
2e	House keeping done on regular basis and scrap removal at site	**Mandatory**	No	Yes	1	Housekeeping records, Inspection/ non-conformity records
2f	Usage of Goggles/Face shields and Hand gloves for gas cutter and grinders		No	Yes	1	PPE Issue Records, Inspection/ non-conformity records
2g	Wall openings & floor openings are guarded?		No	Yes	1	Inspection/ non-conformity records
2h	Adequate illumination provided in all working area?		No	Yes	1	Inspection/ non-conformity records
2i	Safety posters, sign boards and emergency contact numbers in all prominent location are displayed?		No	Yes	1	Inspection/ non-conformity records
2j	Availablity of automatic reverse horns,Main horn, hook latches for Vehicles,mobile cranes,Hydras		No	Yes	1	Inspection/ non-conformity records
2k	Ban of carrying mobile phones to work place is implemented for workers		No	Yes	1	Inspection/ non-conformity records
2l	Availability of Tags & Inspection Certificates for Cranes of all capacities		No	Yes	1	Master T&P List with internal & external test details
2l.2	Availability of Tags & Inspection Certificates for Winches of all capacities		No	Yes	1	Master T&P List with internal & external test details
2l.3	Availability of Tags & Inspection Certificates, color coding for Chain pulley blocks		No	Yes	1	Master T&P List with internal & external test details
2l.4	Availability of Tags & Inspection Certificates for Vehicles - Trailors, Dozers,Dumpers,Excavators.Mixers etc		No	Yes	1	Master T&P List with internal & external test details
2l.5	Availability of Tags & Inspection Certificates for Welding machines,grinders, Drilling machines, etc		No	Yes	1	Master T&P List with internal & external test details
2l.6	Availability of Tags & Inspection Certificates, color coding for Wire rope slings etc		No	Yes	1	Master T&P List with internal & external test details
2l.7	Availability of Tags & Inspection Certificates for Batching plants		No	Yes	1	Master T&P List with internal & external test details
2m.1	Use of Lifting Permit as per requirement		No	Yes	1	Permit Records
2m.2	Use of Height Permit as per requirement		No	Yes	1	Permit Records
2m.3	Use of Hot Work Permit as per requirement		No	Yes	1	Permit Records
2m.4	Use of Excavation permit as per requirement		No	Yes	1	Permit Records
2m.5	Use of Confined space work permit as per requirement		No	Yes	1	Permit Records
2m.6	Use of Grating removal and safety net removal permit as per requirement		No	Yes	1	Permit Records
2m.7	Use of Lockout-Tagout permit as per requirement		No	Yes	1	Permit Records
2m.8	Use of Radiography permit as per requirement		No	Yes	1	Permit Records
2m.9	Use of Night/ Holiday Work Permit as per requirement		No	Yes	1	Permit Records
2m.10	Use of Any other Applicable Permit as per requirement		No	Yes	1	Permit Records
3a	Material safety data sheet(MSDS) available for all chemicals and displayed in usage and storage area?		No	Yes	1	Inspection/ non-conformity records
3b	Spillages of oil/concrete and other chemical is controlled and cleaned by proper method in case of spill?		No	Yes	1	Inspection/ non-conformity records
3c	Availability of adequate number of urinals in workplace and in elevations and maintained	**Mandatory**	No	Yes	1	

Vendor HSE Performance Evaluation Checklist

Health, Safety & Environment

Power Sector Headquarters

Format No. HSEP13:F33
Rev. 00

3d	Availability of rest rooms for workers at site	**Mandatory**	No	Yes	1	
3e	Availabilty of Drinking water facility at work spot		No	Yes	1	
3f	Hygenic Labour colony is provided for workers.		No	Yes	1	
4a	Is heavy/complex critical lifting permit obtained for heavy, complex materials before handling/erection activity?		No	Yes	1	Work Permit records
4b	Whether area below lifting activities barricaded		No	Yes	1	Inspection/ non-conformity records
4c	Availabilty of experienced rigging foreman		No	Yes	1	Experience details of rigging foreman
4d	Is agency is following proper storage and handling procedure as per manufacturer standard for all hazardous material?		No	Yes	1	Procedure for storage & handling
4e	Are oxygen and acetylene cylinders are transported to work place from storage area in trolleys		No	Yes	1	
5a	Whether all deep excavation has been protected by barrier		No	Yes	1	Inspection/ non-conformity records
5b	Sloping/benching & shoring provided for excavation as per requirement?		No	Yes	1	-do-
5c	Proper access and egress provided for excavations?		No	Yes	1	-do-
5d	Blasting is done in controlled manner?		No	Yes	2	-do-
6a	Whether Electrical booth is equipped with Co_2 fire extinguishes and fire buckets filled with sand?		No	Yes	2	Inspection/ non-conformity records
6b	Availability of Illumination lamp in electric booth?		No	Yes	1	-do-
6c	whether Caution Boards have been displayed?		No	Yes	1	-do-
6d	Usage of Metal Plug top for all hand power tools ?		No	Yes	1	-do-
6e	Usage of Insulated welding cables.		No	Yes	1	-do-
6f	Electrical Booth/Distribution Board to be covered by proper Canopy.		No	Yes	1	-do-
6g	Availability of functional & individual 30ma ELCB / RCCB and MCB for protection and conducting periodical checkup?		No	Yes	1	-do-
6h	Double earthing for panel boards and all machinery & proper earth pit with regular inspection available?		No	Yes	1	-do-
6i	Whether Electrician is qualified and experienced		No	Yes	1	Qualification & Experience records of electrician
6j	Availability and usage of Rubber hand gloves by electrician?		No	Yes	1	Inspection/ non-conformity records
7a	Whether Scaffolding pipes made with steel or aluminium, are being used and checked periodically by experienced/ certified scaffolder?		No	Yes	2	Inspection/ non-conformity records
7b	8mm Stainless Steel wire rope with plastic cladding is provided for life line (Vertical / Horizontal) during height work?		No	Yes	2	-do-
7c	Availabilty of emergency lighting in case of power failure		No	Yes	1	-do-
7d	Whether all the openings are covered with Safety Nets made of fire proof Nylon?		No	Yes	1	-do-
7e	Whether MS pipe rails around staircases & platforms in usage are provided with top,middle rails and toe guard ?		No	Yes	1	-do-
7f	Whether Ladder with vertical life line /Fall arrestor is available to climb?		No	Yes	1	-do-
7g	Whether all workers deployed for working at height have been issued height pass after undergoing vertigo test?		No	Yes	1	Height Pass records
7h	Whether all workers deployed for height work / climbing ladder are provided and using Double lanyard safety belt?		No	Yes	1	PPE Issue records, inspection/ non-conformity reports
7i	Is all hand tools/Small material used by height workers is tied firmly to prevent fall?		No	Yes	1	-do-
8a	Flash back arrestors for all gas cutting sets is available on Torch side and cylinder side		No	Yes	1	Inspection/ non-conformity records
8b	Oxygen/Acetylene/LPG cylinders not in use have caps in place and stored separately?		No	Yes	1	-do-
8c	Availabilty of Face screen,Hand gloves,and Apron,for welders		No	Yes	1	-do-
8d	Protection from falling hot molten metal during metal cutting / welding at height by providing GI sheet below the cutting area especially in fire prone areas		No	Yes	1	-do-
9a	Pre-employment medical check-up done for all workers and submitted?		No	Yes	1	Medical check records
9b	Availability of first aid centre, with MBBS doctor(Own or Sharing basis)	**Mandatory**	No	Yes	2	Attendance records
9c	Availablity of Ambulance facility 24 hours (Own or sharing basis)	**Mandatory**	No	Yes	2	-do-
9d	Is First aid trained personnel's are available and their names are displayed at site?	**Mandatory**	No	Yes	1	-do-
9e	Availability of Emergency vehicle at site		No	Yes	1	
9f	Periodical medical check up is conducted for all the workers and submitted?		No	Yes	1	Medical check records
9g	Availabilty of sufficient number of first aid box as per standard list and maintaining record		No	Yes	1	Inspection records
10a	Availablity of Fire extinguishers,buckets at all vulnerable points		No	Yes	2	Fire extinguisher records

Vendor HSE Performance Evaluation Checklist

Health, Safety & Environment

Power Sector Headquarters

10b	Periodic fire mock drill conducted?		No	Yes	1	Fire, Mock drill records
10c	Are all flammable materials are stored separately?		No	Yes	1	
10d	Periodic grass cutting is done in material storage area?		No	Yes	1	
10e	Availabilty of 24V DC lighting in confined space work area		No	Yes	1	
10f	Availabilty of exhaust fan in confined space work area		No	Yes	1	
	Note:				100	

Points other than mandatory can be excluded with appropriate justification (scope etc.)

Additionally: 3 Marks for Fatal Accident and 1 mark for major accident to be deducted

SECTION-B

Special Requirements

(Applicable to this Contract Only)

1. **Establishment of Common Facilities for whole Project –** cost to be borne in full by subcontractor.

Table 1.1

Sl. No.	Item	Facility Details as per Clause No.	Applicable / Not Applicable with Remarks	Package
1	Construction of Medical Centre	a	Applicable	Civil
2	Construction of Worker Training Centre (A part of safety park)	b	Applicable	Civil
3	Construction of Vertigo Test Structure (A part of safety park)	c	Applicable	Civil
4	Deployment of Specialists	d	Applicable	By concerned agencies
5	HSE Equipment	e	Applicable	By concerned agencies
6	HSE measurement devices	f	Applicable	By concerned agencies
7	Urinals in under-construction structures	g	Applicable	By concerned agencies
8	Safety Park	h	Applicable	Civil

a. MEDICAL CENTRE

i. A medical center shall be setup at site with basic facilities for handling medical emergencies

ii. Deployment of Medical Professional:

1. **A qualified medical professional shall be deployed at site at all times.**
2. **When total employee & worker strength at site crosses 500, medical professional with MBBS Degree from recognized institute shall necessarily be deployed**

iii. Ambulance shall be deployed along with a trained driver and accessories as per Schedule V of BOCW Central Rules, 1998. Ambulance shall be utilized exclusively for transporting the accident victim. Ambulance drivers shall be regularly trained in First Aid.

iv. Non deployment of Ambulance and First Aider as above shall invite a penalty of Rs. 30,000 pm and Rs10,000 PM respectively

v. Medical waste shall be disposed as per prevailing legislation (Bio-Medical Waste – Management and Handling Rules, 1998).

vi. Above are bare minimum requirements. Any legal requirements over and above these specifications shall supersede the above requirements

b. WORKER TRAINING CENTRE

i. Indoor Worker Training Center to be developed at site with seating capacity of at least 50 trainees

ii. Projector with following minimum specifications:

Native Resolution	XGA, 1024x768
Brightness (ANSI lumens)	3300
Contrast Ratio	13000:1
Display Color	30 Bits
Aspect Ratio	4:3

iii. A Laptop or Desktop PC with following minimum specifications:

Processor	Intel Celeron Dual Core
Memory (RAM)	2 GB
Graphics Card	2GB Video Memory
Hard Disk Capacity	60 GB
Monitor Size	14 inches
Keyboard	
Mouse	

iv. Stereo speakers with minimum 50W RMS sound output
v. PA system for Addressing Workers
vi. Seating arrangement

c. Development of Vertigo Test Structure:

Vertigo test Structure to be developed as per **Annexure 03**

d. Specialists:

Following specialists shall be deployed by the subcontractor, who shall cater to whole project as per BHEL requirements / instructions

I. **Qualified Rigging Inspector:** subcontractor shall engage one qualified Rigging inspector having undergone a certification course in the discipline of minimum supervisor level. He must have post certification experience of minimum one year. In case of non-deployment, penalty of Rs. 50,000/- per month will be imposed by BHEL.
II. **Qualified Scaffolding Inspector:** Subcontractor shall deploy one qualified Scaffolding inspector having undergone a certification course in the discipline of minimum supervisor level. He must have post certification experience of minimum one year. In case of non-deployment, penalty of Rs. 50,000/- per month will be imposed by BHEL.
III. All the scaffolding workmen being engaged at site should have at least one-year prior experience in erection/ dismantling of scaffolding.
IV. BHEL HSE Dept. can opt for a qualified T&P inspector against a rigging inspector/ scaffolding inspector. T&P inspector must have a certification course in the discipline with minimum one-year post certification experience.

e. **Tools & Equipment:** Following equipment conforming to relevant IS Codes for the job shall be ensured by subcontractor:

S. No.	Item
1	Lifelines
2	Retractable Fall Arrestors
3	Safety Nets (10m X 5m)
4	Sky Climbers
5	Fire Blanket
6	Honey Bee Removal Suit & Kit
7	Flashback Arrestors
8	Barricading Tape & net
9	Binoculars
10	Walkie-Talkies
11	LOTO kit
12	24-Volt light
13	Sand Buckets
14	Hard barricading planks
15	Standby Fire kits

Sl. No.	Item	Type of Job / Purpose
1	Lifelines (Steel Rope) and posts	Height work
2	Retractable Fall Arrestors	Height Work
3	Safety Nets (for fall protection; railings also to be covered)	Height Work
4	Sky Climbers	Height Work
5	Fire Blanket, Spark/ slag collector	Hot Work
6	Honey Bee Removal Suit & Kit	General
7	Flashback Arrestors	Hot work
8	Barricading –Hard (Scaffolding Pipes & Clamps or fabricated using structural/round	Height Work, Excavation, General Barricading
9	Binoculars	HSE Inspection
10	Walkie-Talkies	Lifting
11	LOTO kit	Working on charged line
12	24-Volt light	Confined Space/ temp work
13	Sand and Water Buckets	Hot work/Electrical work
15	Standby Fire kits Fire extinguisher stands	Hot work/Electrical work
16	Inbuilt VRD equipped arc welding machine	Welding work

Above equipment are bare minimum to be essentially maintained at all times. Additional numbers to be deployed as and when required in order to ensure fulfillment of all Safety requirements

f. HSE Measurement Equipment & Tools

Sl. No	Device
1	ELCB Tester
2	Multi meter (Light cables)
3	Earth Resistance Meter
4	Lux Meter
5	Decibel Meter
6	Anemometer
7	Breath Analyzer (Alcohol)
8	Multi-gas analyzer
9	Gas leakage detector / alarm
10	Gas monitor (confined space)
11	Radiation meter & Badges
12	Blood pressure monitor
13	Fire detectors
14	Dust Particle Detector
15	Underground cable detector

In case, sub-contractor fails to deploy tools & equipment as mentioned in clause no. e & f, BHEL will purchase/ arrange the same at the risk and cost of the sub-contractor.

g. Urinals in Under-construction structures:

Urinals in under-construction structures for easy access e.g. in case of Boiler elevations etc.

h. Safety Park

Following are the item wise requirements for the safety park.

Sl. No.	Description	Qty.	Sl. No.	Description	Qty.
1	Class room chair	25 Nos.	28	Hand Gloves (Cotton)	1 No.
2	Office Table	3 Nos.	29	Hand Gloves for Electrician (Rubber)	1 No.
3	Rolling chair	3 Nos.	30	Hand gloves Rubber	1 No.
4	Almirah	1 No.	31	Hand Gloves Lather	1 No.
5	Visitor chair	10 Nos.	32	Construction Safety Uniform (Boiler Suit)	1 No.
6	Drawer	2 Nos.	33	Welding Apron	1 No.

7	Single bed	1 No.	34	Safety Shoes	1 No.
8	Mattress	1 No.	35	Leg Guard for Welder	1 No.
9	Projector	1 No.	36	Poster for Occupational Disease like Pneumoconiosis, silicosis etc.	1 No.
10	Projector screen	1 No.	37	Gum Boot	1 No.
11	Sound speakers	1 No.	38	Full Body Harness	1 No.
12	Desktop Computer	3 Nos.	39	12 MM Wire rope for life line. Length 20 Feet (FT).	1 No.
13	Printer	1 No.	40	Safety Net for man & materials. Size 15 FT X 15FT.	1 No.
14	White Board	1 No.	41	Monkey ladder 15 FT.	1 No.
15	Marker	5 Nos.	42	Fire Extinguisher All types (DCP, CO2 & Foam)	1 No.
16	Duster	1 No.	43	Bed Sheet	1 No.
17	Door Mat	9 Nos.	44	Pillow	1 No.
18	Dustbin (Small + Big)	7+1 Nos.	45	Curtain	12 Nos.
19	Mannequin	1 No.	46	curtain fittings	12 Nos.
20	Helmet	1 No.	47	AC (1.5 TON)	3 Nos.
21	Face Shield	1 No.	48	AC (2 TON)	2 Nos.
22	Safety Goggle	1 No.	49	Rope pulley.	1 No.
23	Welding shield	1 No.	50	PP Rope for pulley	20 Mtr.
24	Ear Muff	1 No.	51	Ladder Clamps	6 Nos.
25	Ear Plug	1 No.	52	Aluminum ladder 6 MTR.	1 No.
26	Nose Mask	1 No.	53	Carry Bag	As Req.
27	Breathing Apparatus	1 No.	54	Scaffolding all Materials for 5 Mtr. Height like. Scaffolding tubes, Sole plate, base plate, Right angle clamps, Swivel clamps, beam clamps, Joint box/joint pin, toe guard/board,	1 Lot

2. **Shared Facilities –** where part of operating cost is borne by subcontractor in proportion to contract value, the subcontractor shall bear running expenses of below mentioned facilities in 'proportion to contract value sharing basis' as finalized by BHEL.

S. No.	Facility
1.	Operation of Medical Centre, Ambulance, Doctor, Nurses, Paramedical staff, Medical Consumables
2.	Construction, Maintenance & Upkeep of Latrines and Urinals in Common spaces
3.	Drinking Water Provision in Common Spaces
4.	Dust Control / Water Sprinkling, Pest Control, Fumigation at Site

Annexure-01

LIST OF REFERENCES (IS Codes)

Sl. No.	Code Name	Title
1	IS: 818-1888 (Reaffirmed 2003)	Code of Practice for Safety and Health requirements in Electric and Gas Welding and Cutting operations.
2	IS: 1179-1967 (Reaffirmed 2003)	Specification for Equipment for Eye & Face protection during welding.
3	IS: 1989 (Part 2):1986 (Reaffirmed 1997)	Specification for Leather Safety Boots & Shoes
4	IS:2925 – 1984 (Reaffirmed 2010)	Specification for Industrial Safety Helmets
5	IS:3521: 1999 (Reaffirmed 2002)	Industrial Safety Belts & Harnesses-Specification
6	IS:3646(Part II) – 1966(Reaffirmed 2003)	Code of Practice for Interior Illumination
7	IS:3696 (Part I) – 1987 (Reaffirmed 2002)	Safety Code for Scaffolds and Ladders
8	IS: 3696(Part 2): 1991 (Reaffirmed 2002)	Scaffolds and Ladders-Code of Safety
9	IS: 3764:1992	Excavation Work – Code of Safety
10	IS:3786 – 1983 (Reaffirmed 2002)	Method for Computation of Frequency and Severity Rates for Industrial Injuries and Classification of Industrial Accidents
11	IS.4014.2.1967	Steel tubular Scaffolding
12	IS:4770: 1991 (Reaffirmed 2006)	Rubber Gloves Specification (Electricals Purposes)
13	IS:4912: 1978 (Reaffirmed 2002)	Safety Requirements for Floor and Wall Openings, Railings and Toe Boards
14	IS: 5557 – 1969	Industrial and Safety rubber knee boots.
15	IS: 5983 – 1980 (Reaffirmed 2002)	Specification for Eye-Protectors
16	IS:6519 – 1971 (Reaffirmed 1997)	Code of Practice for Selection, Care and Repair of Safety Footwear
17	IS.6549.1972	Glossary of terms used for Lifting tackles
18	IS:6994(Part I)-1973 (Re affirmed 1996)	Specification for Industrial Safety Gloves Leather and Cotton Gloves
19	IS.7215.1974	Steel Structure Fabrication

Sl. No.	Code Name	Title
20	IS.7969.1975	Handling and storage of building material
21	IS:8519 – 1977 (Reaffirmed 1983)	Guide for Selection of Industrial Safety Equipment for Body Protection.
22	IS:8520 – 1977 (Reaffirmed 2002)	Guide for Selection of Industrial Safety Equipment for Eye, Face and Ear Protection.
23	IS: 9167:1979	Specification for Ear-Protectors
24	IS: 9473:2002	Respiratory Protective Devices-Filtering Half Masks to protect against Particles-Specification.
25	IS: 9944:1992 (Reaffirmed 2003)	Natural and Man-made Fiber Rope Slings- Recommendations on Safe working loads.
26	IS 11006: 2011	Flash Back (Flame) Arrestor Specification
27	IS: 11226 – 1985	Leather Safety footwear having direct molding sole.
28	IS:11057 – 1884 (Reaffirmed 2001)	Specification for Industrial Safety Nets
29	IS: 12254:1993 (Reaffirmed 2002)	Polyvinyl Chloride (PVC) Industrial Boots Specification
30	IS:13367(Part 1):1992 (Reaffirmed 20030	Safe Use of Cranes-Code of Practice
31	IS: 14166:1994 (Reaffirmed 2002)	Respiratory Protective Devices-Full Face Masks Specification
32	IS:14746: 1999 (Reaffirmed 2003)	Respiratory Protective Devices-Half Masks and Quarter Masks - Specification
33	IS: 15397 :2003 (Reaffirmed 2008)	Portable Extinguisher Mechanical Foam Type (Stored Pressure)-Specification
34	IS: 19011:2002	Guidelines for Quality and/or Environmental Management Systems Auditing

Annexure-2: First Aid Box Items

As per Contract Labor (Regulation & Abolition Act), Central Rules, 1971,

(1) The first-aid box shall be distinctively marked with a white cross on green background and shall contain the following items, namely:

(a) For establishments in which the number of contract laborers employed does not exceed fifty, each first aid box shall contain the following equipment:

(i)	6 small sterilized dressings
(ii)	3 medium size sterilized dressings
(iii)	3 large size sterilized dressings
(iv)	6 pieces of sterilized eye pads in separate sealed packets.
(v)	6 roller bandages 10 cm wide.
(vi)	6 roller bandages 5 cm wide.
(vii)	One tourniquet
(viii)	A supply of suitable splints
(ix)	Three packets of safety pins.
(x)	Kidney tray.
(xi)	3 large sterilized burn dressings.
(xii)	1 (30ml) bottle containing a two percent alcoholic solution of iodine
(xiii)	1 (30 ml) bottle containing Sal volatile having the dose and mode of administration indicated on the label
(xiv)	1 snake bite lancet
(xv)	1 (30gms) bottle of potassium permanganate crystals.
(xvi)	1 pair scissors
(xvii)	1 copy of the First-Aid leaflet issued by the Director General, Factory Advice Service and Labor Institutes, Government of India.
(xviii)	A bottle containing 100 tablets (each of 5 grains) of aspirin
(xix)	Ointment for burns
(xx)	A bottle of suitable surgical anti-septic solution

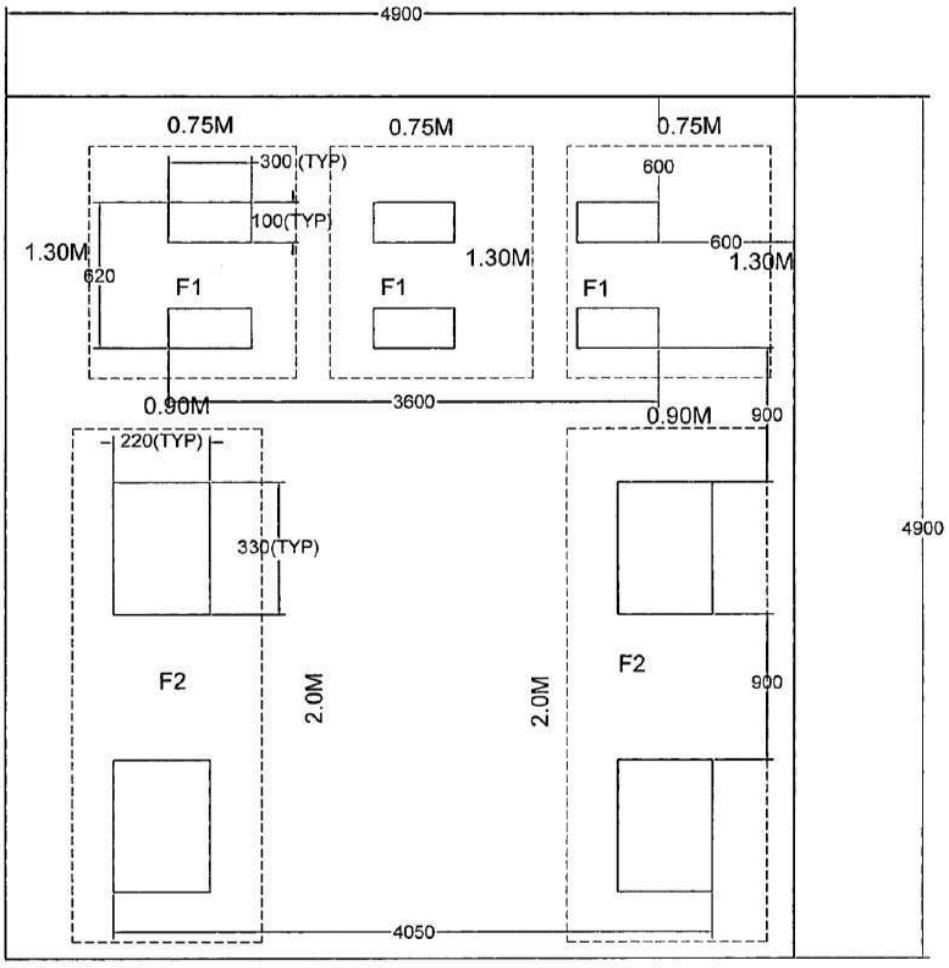
(b) For establishment in which the number of contract laborers exceeds fifty each first-aid box shall contain the following equipment:

(i)	12 small sterilized dressings
(ii)	6 medium size sterilized dressings
(iii)	6 large size sterilized dressings.
(iv)	6 large size sterilized burn dressings
(v)	6 (15 grams) packets sterilized cotton wool
(vi)	12 pieces of sterilized eye pads in separate sealed packets.
(vii)	12 roller bandages 10 cm wide.
(viii)	12 roller bandages 5 cm wide.
(ix)	One tourniquet.
(x)	A supply of suitable splints.
(xi)	Three packets of safety pins.
(xii)	Kidney tray.
(xiii)	Sufficient number of eye washes bottles filled with distilled water or suitable liquid clearly indicated by a distinctive sign which shall be visible at all times.
(xiv)	4 per cent Xylocaine eye drops, and boric acid eye drops and soda by carbonate eye drops.
(xv)	1 (60ml) bottle containing a two percent alcoholic solution of iodine
(xvi)	One (two hundred ml) bottle of mercurochrome (2 per cent) solution in water.
(xvii)	1 (120ml) bottle containing Sal volatile having the dose and mode of administration indicated on the label.
(xviii)	1 roll of adhesive plaster (6 cmX1 meter)
(xix)	2 rolls of adhesive plaster (2 cmX1 meter)
(xx)	A snake bite lancet.
(xxi)	1 (30 grams) bottle of potassium permanganate crystals.
(xxii)	1 pair scissors
(xxiii)	1 copy of the First-Aid leaflet issued by the Director-General, Factory Advice service and labor Institutes, Government of India.
(xxiv)	a bottle containing 100 tablets (each of 5 grains) of aspirin
(xxv)	Ointment for burns
(xxvi)	A bottle of a suitable surgical anti septic solution.

(2) Adequate arrangement shall be made for immediate recoupment of the equipment when necessary.

Annexure-3: Vertigo test structure specifications

Table 1	
S. No.	**Topic**
1	**Vertigo / Height working Test Structure Layout**
2, 3	**Structure Layout Sketch**
3	**Actual Photo of a typical structure**
4	**Bill of Materials**
5	**Guidelines for Conducting the Test**

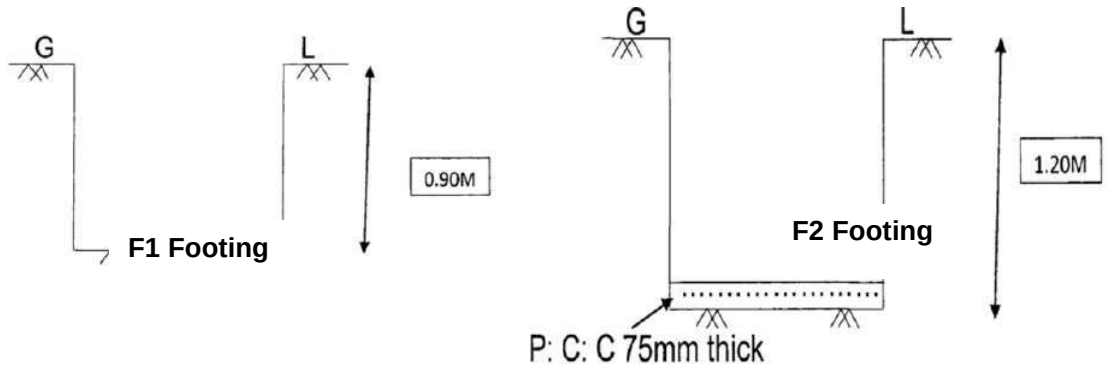


Note:

- All dimensions are in mm
- Drawing is not to scale
- Inside boundary area to be filled with sand to level with road (external)
- Details of F1 and F2 are shown below

Figure 1: Vertigo / Height Work Test Structure Layout

Vertigo test structure specifications…



Note:

- Concrete Grade is M15
- Drawing is not to scale
- TOC is at Road Level
- G L refers to Ground Level

Figure 2

Vertigo test structure specifications…

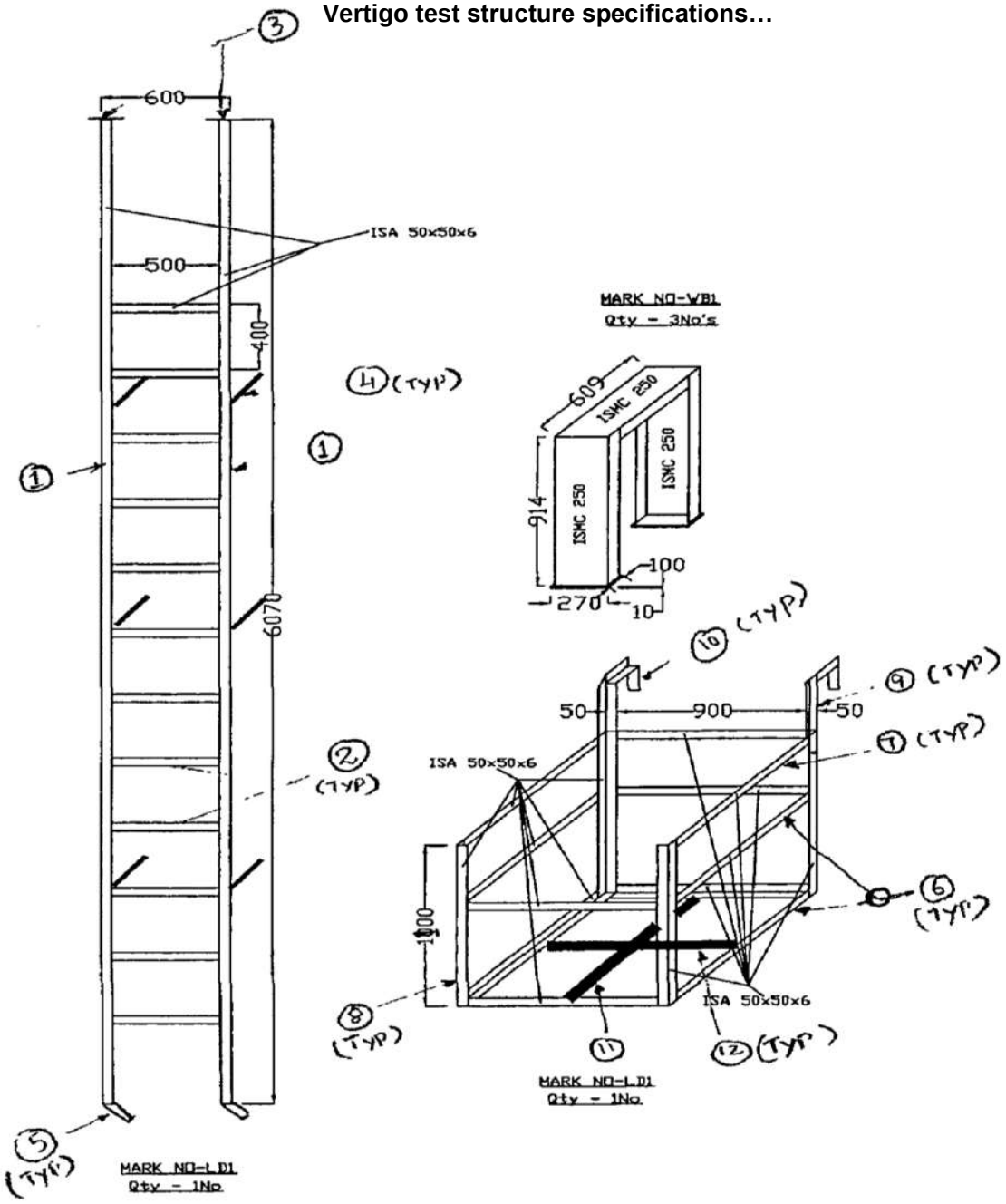


Figure 3

Vertigo test structure specifications…

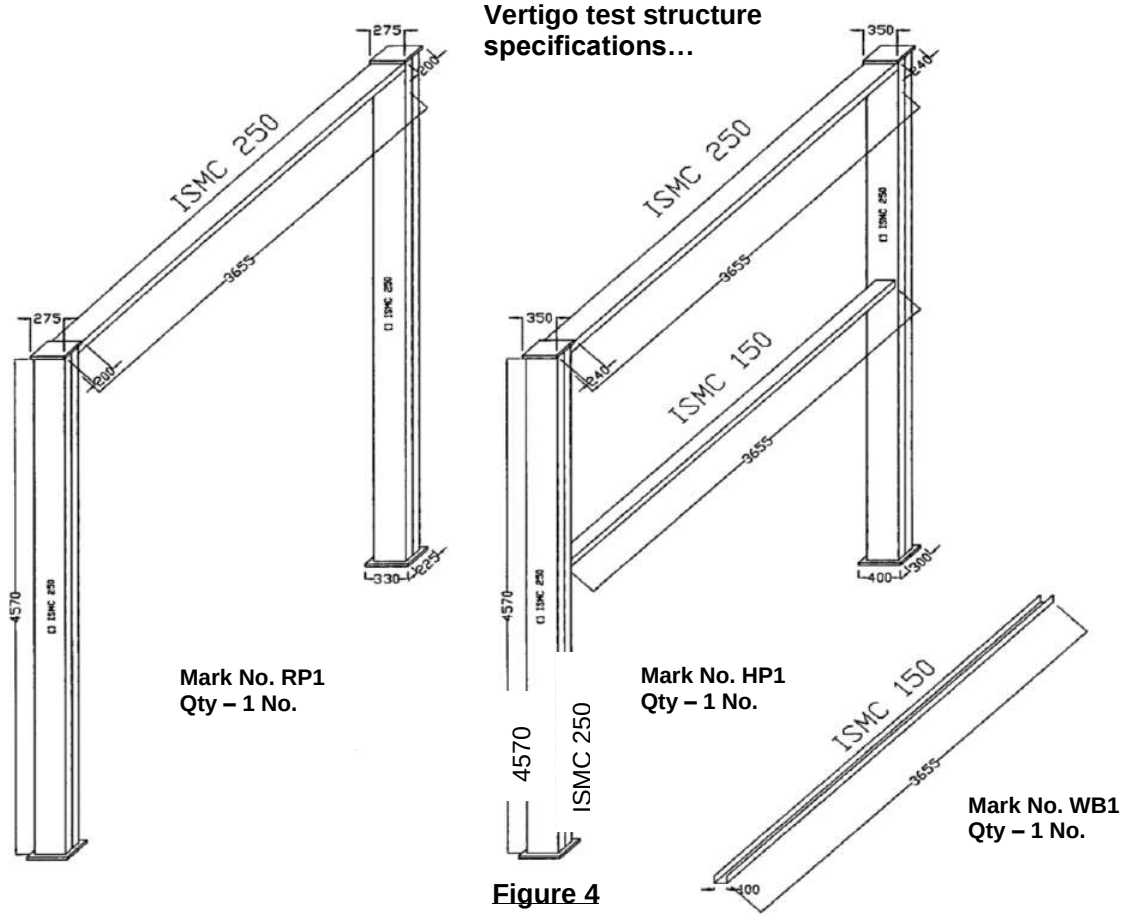


Figure 4

Pic-1: Actual Photo of a Typical Vertigo Test

Vertigo test structure specifications…

Table 2: BOM FOR HEIGHT WORK INDUCTION TRAINING MODULE						
Sl. No.	**Description**	**Width (mm)**	**Length (mm)**	**Qty (No's)**	**Unit Wt (Kgs)**	**Total Wt. (Kgs)**
MKD NO. WB1						
1	ISMC250		609	3	34.20	62.483
2	ISMC250		914	6	34.20	187.553
3	ISMC100		3655	1	9.56	34.942
4	PL10	100	270	6	78.50	12.717
			Total Weight (Kgs)			**297.695**
MKD NO. RP1						
1	ISMC250		4570	4	34.20	625.176
2	ISMC250		3655	1	34.20	125.001
3	PL25	225	330	2	196.25	29.143
4	PL25	200	275	2	196.25	21.588
			Total Weight (Kgs)			**800.908**
MKD NO. HP1						
1	ISMC250		4570	4	34.20	625.176
2	ISMC250		3655	1	34.20	125.001
3	ISMC150		3655	1	16.80	61.404
4	PL25	300	400	2	196.25	47.100
5	PL25	240	350	2	196.25	32.970
			Total Weight (Kgs)			**891.651**
MKD NO. LD1						
1	ISA50X50X6		6070	2	4.50	54.630
2	ISA50X50X6		500	12	4.50	27.000
3	PL12	75	75	2	94.20	1.060
4	ISA50X50X6		300	6	4.50	8.100
5	ISA50X50X6		255	2	4.50	2.295
6	ISA50X50X6		1000	8	4.50	36.000
7	ISA50X50X6		910	3	4.50	12.285
8	ISA50X50X6		1100	4	4.50	19.800
9	ISA50X50X6		650	2	4.50	5.850
10	ISA50X50X6		350	2	4.50	3.150
11	PL8	75	900	1	62.80	4.239
12	PL8	75	410	2	62.80	3.862
			Weight (Kgs)			**178.271**
			Total Weight (Kgs)			**2168.525**

Vertigo test structure specifications…

A. Test Procedure / Guidelines

Fear of height may be physiological or psychological. Therefore, to rule out any possibility of physiological factor, detailed medical check-up of workers is carried out before vertigo test. Medical check-up of workers includes the following:

History of past illnesses (like epilepsy, drug allergy, diabetics/ hypertension, unconsciousness etc.), general physical examination (like height, weight, BMI, build and nourishment etc.), measurement of pulse rate, Blood Pressure, respiratory rate.

After this check-up, those who are found suitable for height work by examining doctor, are allowed to undergo vertigo test.

During this health check-up, psychology of workers is also studied. If any worker finds it extremely difficult/ frightening to climb the monkey ladder & walk on the beam, during/after performing vertigo test or even before performing, then he is treated as disqualified.

As per standard, during vertigo test, worker is allowed to climb on a foundation through monkey ladder, walk on a beam, then steps down at the other end of beam, through monkey ladder. Height of the beam should be at least six feet from ground level. All necessary safety precautions are taken during this test. Worker has to wear full body harness with double lanyard. A horizontal lifeline is run parallel to the beam and worker has to put his lanyards into the lifeline. Additionally, a safety net is also put below the beam for rescue of the victim in case of a fall from beam.

Following activities are generally carried during testing:

1. **Walking Bench Training:**

a. Person should walk over the channel. He should maintain balance & walk without much problem.

b. If the person has problem to balances himself on repeated chances, he may be having flat foot or some other problem. So, he may not be fit for height work.

2. **Rope Climb Training:**

   Person should be able to climb the rope up to the top channel for ensuring that in case of fall, a person hanging on the safety harness, will be able to safely climb back to the platform within minimum time period before the safety harness start breaking down under the load.

3. **Height Work Training:**

   Person should walk freely on the middle channel while holding the top channel with the help of safety harness.

4. **Ladder for Vertical fall arrestor Training:**

   Vertical fall arrestor rope is fixed from top to bottom of the ladder. It will ensure:

- Usage of vertical fall arrestor.
- Usage of two lanyards of a safety harness.
- Ensure 3-point contact on the ladder while climb.

5. **Chair for work at height Training:**

- Climb though vertical ladder with two lanyard ropes.
- Hooking of two lanyard ropes to life line. With this safe arrangement, he can walk to chair.
- Sits in the chair safely, comes out & walks back to the vertical ladder & come down from vertical ladder. After completion of vertigo test, blood pressure of worker is again measured. If it is not within acceptable limits for any worker, concerned worker is denied height pass.

  Only those who pass the above training are fit for height work.

RECORD OF REVISION

Clause No.	Rev. No.	Brief Description of Revision	Date
All	00	New Procedure Introduced	25.04.2019
All	01	OCPs-60, 61& 62 introduced, New formats introduced, lifeline diameter change (8 mm to 12 mm), introduction of modern PDB, VRD inbuilt arch welding machine, qualification & experience of scaffolding inspectors, rigging inspectors, penalty for non-deployment, mandatory PPEs for electrical work, penalty format, mandatory back camera and horn for all vehicles, only use of cup type scaffoldings	20.07.2020
All	02	-Document has been made in line with OPGC HSE Plan & Manual. -New systems added are: Painting job, LOTO Procedure, Noise Mitigation, Prevention of covid-19 at project site & Rescue plan (Against clause no. 13)	01.09.2020

Health, Safety & Environment Department,
Power Sector Eastern Region

Bharat Heavy Electricals Limited

ANNEXURE-2

FORMAT FOR NO DEVIATION CERTIFICATE
(To be submitted in the bidder's letter head)

BHARAT HEAVY ELECTRICALS LIMITED,
Power Sector - Eastern Region,
Plot no 9/1, DJ Block, Sector – II, Salt Lake City,
Kolkata – 700 091

Sub	No Deviation Certificate.	
Job	Civil, Structural & Architectural works for Main Plant & BOP (excluding piling and levelling & grading work) for 1x660 MW, Unit no. 5, WBPDCL Sagardighi TPP Extension Project.	
Ref	1.0	Tender no PSER:SCT:SDG-C2062:20.
	2.0	BHEL's NIT, vide reference no PSER:SCT:SDG-C2062:8055, Date: 18-07-2020.
	3.0	BHEL's TCN-01, vide reference no PSER:SCT:SDG-C2062:TCN-01, Date: 27-07-2020.
	4.0	BHEL's TCN-02, vide reference no PSER:SCT:SDG-C2062:TCN-02, Date: 03-08-2020.
	5.0	BHEL's TCN-03, vide reference no PSER:SCT:SDG-C2062:TCN-03, Date: 10-08-2020.
	6.0	BHEL's TCN-04, vide reference no PSER:SCT:SDG-C2062:TCN-04, Date: 13-08-2020.
	7.0	BHEL's TCN-05, vide reference no PSER:SCT:SDG-C2062:TCN-05, Date: 14-08-2020.
	8.0	BHEL's TCN-06, vide reference no PSER:SCT:SDG-C2062:TCN-06, Date: 20-08-2020.
	9.0	BHEL's TCN-07, vide reference no PSER:SCT:SDG-C2062:TCN-07, Date: 27-08-2020.
	10.0	BHEL's TCN-08, vide reference no PSER:SCT:SDG-C2062:TCN-08, Date: 28-08-2020.
	11.0	BHEL's TCN-09, vide reference no PSER:SCT:SDG-C2062:TCN-09, Date: 07-09-2020.
	12.0	All other pertinent issues till date.

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT. We hereby confirm our unqualified acceptance to all terms & conditions, unqualified compliance to technical specification, integrity pact (if applicable) and acceptance to reverse auctioning process.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted/uploaded offer/documents in accordance with tender instructions with acceptance of the terms & conditions of the tender by us and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)