for the entire auction (i.e. for all the items in the auction), from the time that bid comes in. Please note that the auto-extension will take place only if a bid comes in those last {…} minutes and if that bid gets accepted as the lowest bid. If the bid does not get accepted as the lowest bid, the auto-extension will not take place even if that bid might have come in the last {…} minutes. In case, there is no bid in the last {…} minutes of closing of Reverse Auction, the auction shall get closed automatically without any extension. However, bidders are advised not to wait till the last minute or last few seconds to enter their bid during the auto-extension period to avoid complications related with internet connectivity, network problems, system crash down, power failure, etc.

The above process will continue till completion of Reverse Auction.

Complaints/ Grievances, if any, regarding denial of service or any related issue should be given in writing thru e-mail/ fax to M/s. {Service provider} with a copy to BHEL within 15 minutes prior to initial closing time of Reverse Auction.

4. **Bid price:** The Bidder has to quote the {……} Price inclusive of Packing & Forwarding charges, all the routine & type tests as per tender scope, taxes, duties, freight and insurance as specified in tender document. including loading (if indicated by BHEL due to deviations in technical/ commercial terms) for the Items specified. Details are as shown in Excel Sheet for calculation of total cost to BHEL (To be specified by Unit as per NIT conditions).

5. **Bidding currency and unit of measurement:** Bidding will be conducted in *Indian Rupees* per *Unit* of the material as per the specifications {...}

   In case of foreign currency bids, exchange rate (TT selling rate of State Bank of India) as on scheduled date of tender opening (Part-I bid) shall be considered for conversion in Indian Rupees. If the relevant day happens to be a Bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken.

6. **Validity of bids:** Price shall be valid for {… *days}* from the date of reverse auction. These shall not be subjected to any change whatsoever.

7. **Lowest bid of a bidder**: In case the bidder submits more than one bid, the lowest bid at the end of Reverse Auction will be considered as the bidder's final offer to execute the work.

8. Unique user IDs shall be used by bidders during bidding process. All bids made from the Login ID given to the bidders will be deemed to have been made by the bidders/ bidders' company.

9. **Post auction procedure**: BHEL will proceed with the Lowest Bid in the Reverse Auction for further processing.

10. Any commercial/ technical loading shall be separately intimated to respective bidders prior to RA. The excel sheet provided in this regard shall cover all these aspects. Commercial/ technical loading if any, shall be added by the respective bidder in its price during Reverse Auction. Modalities of loading & de-loading shall be separately intimated to the bidders. The responsibility for correctness of total cost to BHEL shall lie with the bidders.

11. Reverse auction shall be conducted by BHEL (through M/s {*Service Provider*}), on pre-specified date, while the bidders shall be quoting from their own offices/ place of their choice. Internet connectivity shall have to be ensured by bidders themselves.

    During the RA process if a bidder is not able to bid and requests for extension of time by FAX/ email/ phone then time extension of additional 15 minutes will be given by the service provider provided such requests come before 5 minutes of auction closing time. However, only one such request per bidder can be entertained.

    In order to ward-off contingent situation of connectivity failure bidders are requested to make all the necessary arrangements/ alternatives whatever required so that they are able to circumvent such situation and still be able to participate in the reverse auction successfully. Failure of power or loss of connectivity at the premises of bidders during the Reverse auction cannot be the cause for not participating in the reverse auction. On account of this, the time for the auction cannot be extended and neither BHEL nor M/s. {*Service provider*} is responsible for such eventualities.

12. Proxy bids: Proxy bidding feature is a pro-bidder feature to safe guard the bidder's interest of any internet failure or to avoid last minute rush. The proxy feature allows bidders to place an automated bid in the system directly in an auction and bid without having to enter a new amount each time a competing bidder submits a new offer. The bid amount that a bidder enters is the minimum that the bidder is willing to offer. Here the software bids on behalf of the bidder. This obviates the need for the bidder participating in the bidding process until the proxy bid amount is decrementally reached by other bidders. When proxy bid amount is reached, the bidder (who has submitted the proxy bid) has an option to start participating in the bidding process.

The proxy amount is the minimum amount that the bidder is willing to offer. During the course of bidding, the bidder cannot delete or change the amount of a proxy bid.

Bids are submitted in decrements (decreasing bid amounts). The application automates proxy bidding by processing proxy bids automatically, according to the decrement that the auction originator originally established when creating the auction, submitting offers to the next bid decrement each time a competing bidder bids, regardless of the fact whether the competing bids are submitted as proxy or standard bids. However, it may please be noted that if a manual bid and proxy bid are submitted at the same instant manual bid will be recognized as the L1 at that instant.

In case of more than one proxy bid, the system shall bid till it crosses the threshold value of 'each lowest proxy bid' and thereafter allow the competition to decide the final L1 price.

Proxy bids are fed into the system directly by the respective bidders. As such this information is privy only to the respective bidder(s).

13. Bidders are advised to get fully trained and clear all their doubts such as refreshing of Screen, quantity being auctioned, tender value being auctioned etc from M/s {*Service provider*}.

14. M/s. {*Service provider*}, shall arrange to demonstrate/ train the bidder or bidder's nominated person(s), without any cost to bidders. M/s. {*Service provider*}, shall also explain the bidders, all the business rules related to the

Reverse Auction. Bidders are required to submit their acceptance to the terms/ conditions/ modalities before participating in the Reverse Auction in the process compliance form as enclosed. Without this, the bidder will not be eligible to participate in the event.

15. Successful bidder shall be required to submit the final prices (L1) in prescribed format (Annexure – VI) for price breakup, quoted during the Reverse Auction, duly signed and stamped as token of acceptance without any new condition (other than those already agreed to before start of auction), after the completion of auction to M/s. {*Service provider*} besides BHEL within two working days of Auction without fail.

16. Any variation between the final bid value and that in the confirmatory signed price breakup document will be considered as tampering the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings (as available on www.bhel.com).

17. Bidders' bid will be taken as an offer to execute the work/ supplies the item as per enquiry no. {...} dt. {...}. Bids once made by the bidder, cannot be cancelled/ withdrawn and bidder shall be bound to execute the work as mentioned above at bidder's final bid price. Should bidder back out and not execute the contract as per the rates quoted, BHEL shall take action as per extant guidelines for suspension of business dealings (as available on www.bhel.com).

18. Bidders shall be able to view the following on their screen along with the necessary fields during Reverse Auction:

a. Leading (Running Lowest) Bid in the Auction (only total price of package)
b. Bid Placed by the bidder
c. Start Price
d. Decrement value
e. Rank of their own bid during bidding as well as at the close of auction.

19. BHEL's decision on award of contract shall be final and binding on all the Bidders.

20. BHEL reserves the right to extend, reschedule or cancel the Reverse Auction process at any time, before ordering, without assigning any reason, with

intimation to bidders.

21. BHEL shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause. In such cases, the decision of BHEL shall be binding on the bidders.

22. Other terms and conditions shall be as per bidder's techno-commercial offers and other correspondences, if any, till date.

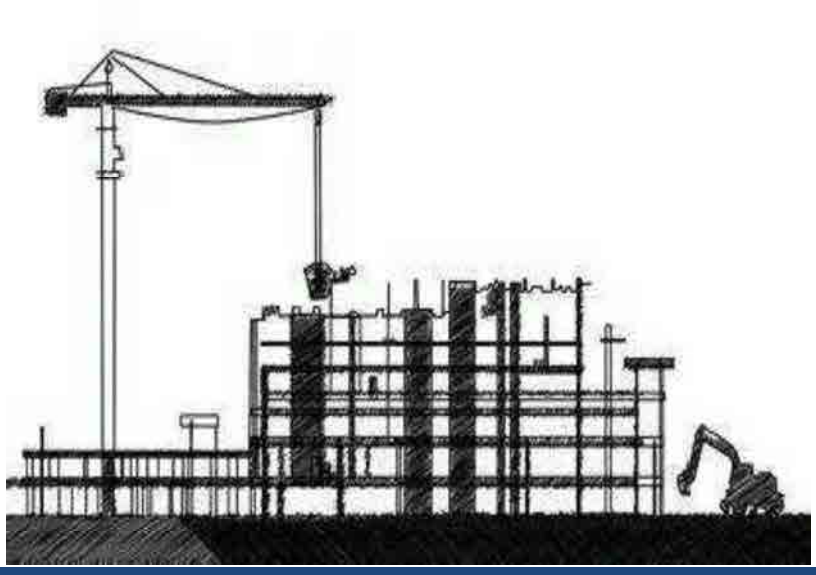
23. If there is any clash between this business document and the FAQ available, if any, in the website of M/s. {*Service provider*}, the terms & conditions given in this business document will supersede the information contained in the FAQs. Any changes made by BHEL/ service provider (due to unforeseen contingencies) after the first posting shall be deemed to have been accepted if the bidder continues to access the portal after that time.

24. Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action *as per extant BHEL guidelines for suspension of business dealings (as available on www.bhel.com)*, shall be initiated by BHEL.

HEALTH, SAFETY AND ENVIRONMENT PLAN

For

SITE OPERATION
For BHEL PSSR
NALCO
DAMANJODI SITE.
1 X 18.5 MW,
BTG PROJECT.



POWER SECTOR

HSE PLAN FOR SITE OPRATIONS BY BHEL'S SUB-CONTRACTORS

AT A GLANCE

BEFORE START

SIGNING OF MOU
Agree to comply to HSE requirement- Statutory and BHEL's

PLAN

HSE ORGANISATION	
Manpower • 1 (one) safety officer for every 500 workers or part there of • 1(one) safety-steward/ supervisor for every 100 workers • **Qualification** As per Cl. 7.1	**HSE Roles and responsibilities** • Site In-charge- As per clause7.2.1 • Safety officer- As per clause7.2.2

HSE Planning
for Man, Machinery/Equipment/Tools & Tackles

PROVIDE

HSE INFRASTUCTURE	
• PPEs • Drinking Water • Washing Facilities • Latrines and Urinals • Provision of shelter for rest • Medical facilities	• Canteen facilities • Labour Colony • Emergency Vehicle • Pest Control • Scrapyard • Illumination

TRAIN

HSE TRAINING , AWARENESS & PROMOTION	
Training • Induction training • Height work and other critical areas • Tool Box talk & Pep Talk	**Awareness & Promotion** • Signage • Poster • Banner • Competition • Awards

COMMUNICATE

HSE COMMUNICATION	
Incident Reporting • Accident- Fatal & Major • Property damage • Near Miss	**Event Reporting** • Celebrations • Training • Medical camp

EXECUTE SAFELY

OPERATIONAL CONTROL PROCEDURES

PERMIT TO WORK

Height work (above 1.8 meters), Hot Work, Heavy Lifting, Confined Space, Radiography, Excavation (More than 1.5 meters)

SAFETY DURING WORK EXECUTION	
• Welding • Rigging • Cylinder- storage & Movement • Demolition work • T&Ps • Chemical Handling • Electrical works	• Fire • Scaffolding • Height work • Working Platform • Excavation • Ladder • Lifting • Hoisting appliance

HOUSE KEEPING

WASTE MANGEMENT

TRAFFIC MANAGEMENT

ENVIRONMENTAL CONTROL

EMERGENCY PREPAREDNESS AND RESPONSE PLAN

CHECKS

HSE AUDITS & INSPECTION	
• Daily Checks • Inspection of PPEs • Inspection of T&Ps • Inspection of Cranes, Hydra ,Winches & lifting tool and tackles	• Inspection of Height work • 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 Unit incremental penalty to be imposed. The subcontractor will pay 2 times the penalty compared to previously paid in case there are repeated cases of fatal incidents under the same subcontractor for the same package in the same unit.

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR NALCO DAMANJODI SITE	Doc no.: HSEP: 14
		REV: 01
	POWER SECTOR	Date: 31.03.2021

HSE
PLAN FOR SITE OPERATION FOR

PROJECT: -

BHEL PSSR NALCO DAMANJODI SITE. 1 X 18.5 MW, BTG PROJECT

SCOPE OF WORK: -

SITE WORK FOR COAL FIRED STEAM GENERATOR, TURBO GENERATOR, Sox & NOx Control System & its Auxiliaries along with associated facilities for steam & power Plant under 5th Stream Alumina Refinery Expansion Project at NALCO Damanjodi, Odisha

LOA No:-

REVISION HISTORY SHEET

Date	Revision No	Details of Changes	Reason	Prepared	Reviewed	Approved
20.1.2021	00	First issue	First issue	Sandeep Dalal, SE/ HSE-HQ	M. Shrivastava, AGM/HSE/HQ	M. Shrivastava, AGM/HSE/HQ
31.03.2021	01	Second issue	Discussed with consultant (M/s Dastur) to incorporate few points	Sandeep Dalal, SE/ HSE-HQ	M. Shrivastava, AGM/HSE/HQ	M. Shrivastava, AGM/HSE/HQ

SIGNATURES

Prepared By:-	Reviewed By:-	Approved By:-
Sandeep Dalal/ Sr. Engr (HSE) PSSR-HQ Sandeep 19/4/2021	M. Shrivastava /AGM (HSE) PSSR-HQ 19.4.2021 मुकेश श्रीवास्तव MUKESH SRIVASTAV अपर महाप्रबंधक (एच.एस.ई) / Addl. General Manager (HSE) बी.एच.ई.एल. - पी.एस.एस.आर. / B.H.E.L. - P.S.S.R. टेक टॉवर्स / Tek Towers नं.11, राजीव गाँधी सालै, तोरईपाक्कम, ओ.एम.आर., चेन्नै - 600 097 11, Rajiv Gandhi Salai, Thoraipakkam, OMR, Chennai - 600 097	M. Shrivastava /AGM (HSE) PSSR-HQ 19.4.2021 मुकेश श्रीवास्तव MUKESH SRIVASTAV अपर महाप्रबंधक (एच.एस.ई) / Addl. General Manager (HSE) बी.एच.ई.एल. - पी.एस.एस.आर. / B.H.E.L. - P.S.S.R. टेक टॉवर्स / Tek Towers नं.11, राजीव गाँधी सालै, तोरईपाक्कम, ओ.एम.आर., चेन्नै - 600 097

FOR DASTUR/NALCO CHECKED BY

NAME	MR. SUBHASH MUKHERJEE	APPROVED BY MR. SUBHASH MUKHERJEE
DESIGNATION	ASST. MANAGER SAFETY	ASST. MANAGER SAFETY For Dastur
DATE	27.04.2021	27.04.2021
SIGNATURE	SUBHASH MUKHERJEE Asst. Manager Safety M.N. Dastur & Co. Pvt. Limited NALCO, Damanjodi	SUBHASH MUKHERJEE Asst. Manager Safety M.N. Dastur & Co. Pvt. Limited NALCO, Damanjodi

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1.0 PURPOSE

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 arisen from foreseeable conditionsduringinstallationandservicingofindustrialprojectsandpowerplants.

This document shall be followed by BHEL's Sub-contractor at all installation and servicing sites. In case customer specific documents are to be implemented, this document will be followed in conjunction with customer specific documents.

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.
In case the customer has any specific requirement, the same is to be fulfilled.

2.0 SCOPE

The document is applicable for BHEL's Sub-contractor at all installation / servicing activities of BHEL Power Sector as per the relevant contractual obligations.

3.0 OBJECTIVES AND TARGETS

The HSE Plan reflects that BHEL places high priority upon the Occupational Health, Safety and Environment at workplaces.

- Ensure the Health and Safety of all persons at work site is not adversely affected by the work.
- Ensure protection of environment of the worksite.
- Comply at all times with the relevant statutory and contractual HSE requirements.
- Provide trained, experienced and competent personnel. Ensure medically fit personnel only are engaged at work.
- Provide and maintain plant, places and systems of work that are safe and without risk to health and the environment.
- Provide all personnel with adequate information, instruction, training and supervision on the safety aspect of their work.
- Effectively control, co-ordinate and monitor the activities of all personnel on the Project sites including Sub-contractor in respects of HSE.
- Establish effective communication on HSE matters with all relevant parties involved in the Project works.
- Ensure that all work planning takes in to account all persons that may be affected by the work.
- Ensure fitness testing of all T&Ps/Lifting appliances like cranes, Hydra, chain pulley blocks etc. are to be certified by competent person.
- Ensure timely provision of resources to facilitate effective implementation of HSE requirements.
- Ensure continual improvements in HSE performance
- Ensure conservation of resources and reduction of wastage.
- 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 and preventive action.

BHEL POWER SECTOR HSE TARGETS	
EXPLOSION FATALITY	ZERO
LOST TIME INJURY FIRE	ZERO
VEHICLE INCIDENTS ENVIRONMENTAL INCIDENTS	ZERO
	ZERO
	ZERO
	ZERO

4.0 BHEL POWER SECTOR HEALTH, SAFETY & ENVIRONMENT POLICY

Health, Safety &Environment Policy of BHEL

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.

sd/-

CMD, BHEL

5.0 MEMORANDUM OF UNDERSTANDING:

After award of work, Sub-contractor are required to enter into a memorandum of understanding as given below:

Memorandum of Understanding

BHEL, Power Sector_____Region is committed to Health, Safety and Environment Policy (HSE Policy).

M/s_____do hereby also commit to comply with the same HSE Policy w h i l e Executing the Contract Number

M/s_____shall ensure that safe work practices as per the HSE plan. Spirit and content therein shall be reached to all workers and supervisors for compliance.

In addition to this, M/S_____shall comply to all applicable statutory and regulatory requirements which are in force in the place of project and any special requirement specified in the contract document of the principal customer.

M/s_____shall co-operate in HSE audits/inspections conducted by BHEL /customer/ third party and ensure to close any non-conformity observed / reported with in prescribed time limit.

Signed by authorized representative of M/s----------

Name :

Place & Date:

6.0 TERMS AND DEFINITIONS

6.1 DEFINITIONS

6.1.1 INCIDENT

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

6.1.2 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".

6.1.3 MAN-HOURS WORKED

The total number of man-hours worked by all employees including sub-contractors working in the premises. It includes managerial, supervisory, professional, technical, clerical and other workers including contract labours. 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.

6.1.4 FIRST AID CASES

First aids are essentially all reportable cases, where the injured person is given medical treatment and discharged immediately for reporting on duty, without counting any lost time.

6.1.5 LOST TIME INJURY

Any work injury, which renders the injured person unable to perform his regular job or an alternative restricted work assignment on the next scheduled work day after the day on which the injury occurred.

6.1.6 MEDICAL CASES

Medical cases come under non-reportable cases, where owing to illness or other reason the employee was absent from work and seeks Medical treatment.

6.1.7 TYPE OF INCIDENTS & THEIR REPORTING:

The three categories of Incident are as follows:

Non- Reportable Cases:
An incident, where the injured person is given medical help and discharged for work without counting any lost time.

REPORTABLE CASES:
In this case the injured person is disable for 48 hours or more and is not able to perform his duty.

INJURY CASES:
These are covered under the heading of non-reportable cases. In these cases, the incident caused injury to the person, but he still continues his duty.

6.1.8 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:

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

6.1.9 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:

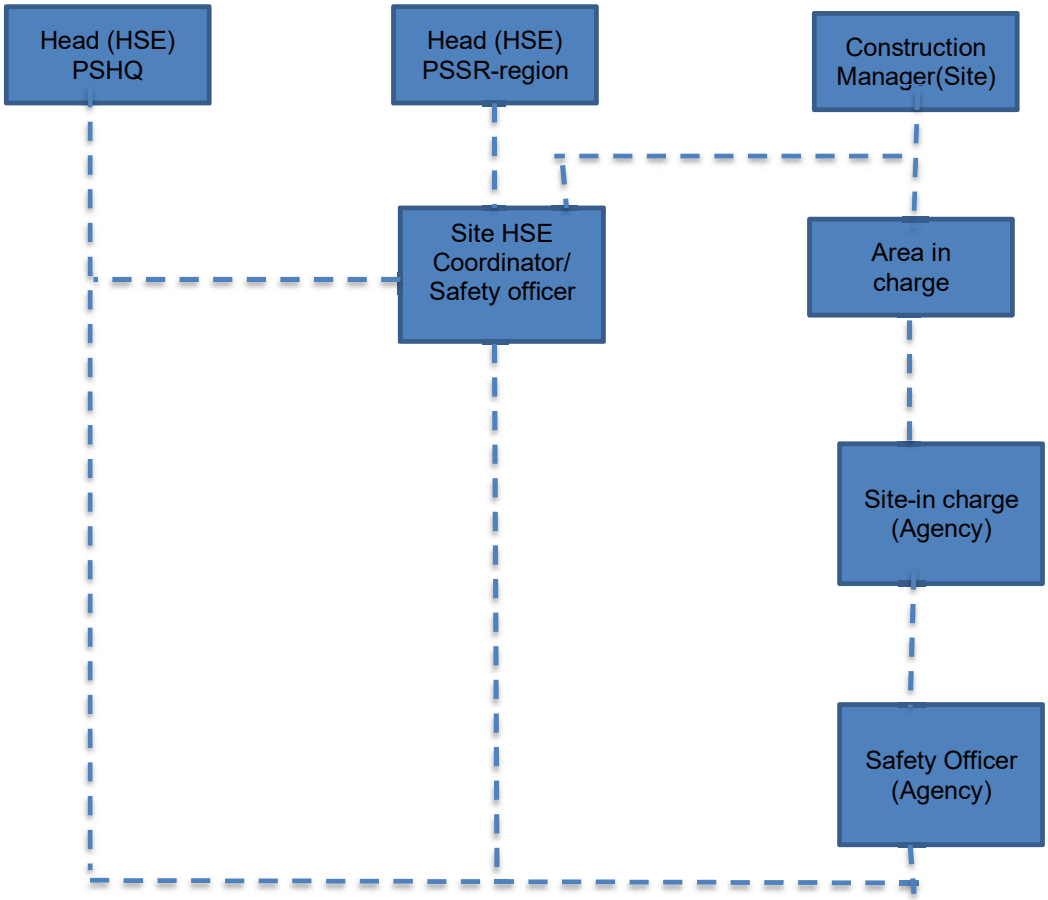
$$\frac{\text{Days lost due to LTI}}{\text{Total Man Hours Worked}} \times 1{,}000{,}000$$

6.1.10 INCIDENCE RATE

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

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

7.0 HSE ORGANISATION



7.1 NUMBER OF SAFETY OFFICERS

The Sub-contractor must deploy one safety officer for every 500 workers or part thereof in each package. In addition, there must be one safety-steward/safety-supervisor for every 100 workers.

Deployment: The sub-contractor should deploy sufficient safety officers and safety-steward /Safety-supervisor, as per requirement given above, since very initial stage and add more in proportion to the added strength in work force. any delay in deployment will attract a penalty of Rs.30,000/ per man month for the delayed period.

7.2 QUALIFICATION FOR HSE PERSONNEL

Sl.no	Designation	Qualification	Experience
1.	Safety officer (Construction Agency)	Degree or Diploma in Engineering with full time diploma in Industrial Safety with construction safety as one of the subjects	Minimum two years for degree holder and five years for diploma holder in the field of Construction of power plant/ major industries
2.	Safety Supervisor (Construction Agency)	A recognized Degree in Science (with Physics & Chemistry) alternatively Degree or diploma in any branch of engineering / tech with full time diploma in Industrial Safety with construction safety as one of the Subjects.	Minimum two years
3.	Safety Steward (Construction Agency)	As a minimum, he shall preferably possess School-leaving Certificate (of Class XII with Physics & Chemistry etc.) and trained in fire fighting as well as in safety/ occupational health related subjects, and preferably have adequate knowledge of the language spoken by majority of the workers at the construction site.	Minimum two years

7.3 RESPONSIBILITIES

7.3.1 SITE IN-CHARGE OF SUB CONTRACTOR

- Shall sign Memorandum of Understanding (MOU) for compliance to BHEL's HSE Plan for Site Operations as per clause 5.0
- Shall engage qualified safety officer(s) and steward (s) as per clause7.0
- Shall adhere to the rules and regulations mentioned in this code, practice very strictly in his area of work in consultation with his concerned engineer and the safety coordinators.
- Shall screen all workers for health and competence requirement before engaging for the job and periodically thereafter as required.
- Shall not engage any employee below 18 years.
- 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 RegulationR57.
- Shall ensure that all T&Ps engaged are tested for fitness and have valid certificates from competent person.
- Shall ensure that provisions stipulated in contract Labour Regulation Act 1970, Chapter V C.9, canteen, rest rooms/washing facilities to contracted employees at site.
- Shall adhere to the instructions laid down in Operation Control Procedures (OCPs) available with the site management.
- Shall ensure that person working above 1.8 meter should use Safety Harness tied to a lifeline/ stable structure.
- Shall ensure that materials are not thrown from height. Cautions to be exercised to prevent fall of material from height.
- Shall report all incidents (Fatal/Major/Minor/Near Miss) to the Site engineer/HSE officer of BHEL.
- Shall ensure that Horseplay is strictly forbidden.
- Shall ensure that adequate illumination is arranged during night work.
- Shall ensure that all personnel working under sub-contractor are working safely and don ot create any Hazard to self and to others.
- Shall ensure display of adequate signage/posters on HSE.
- Shall ensure that mobile phone is not used by workers while working.
- Shall ensure conductance of HSE audit, mock drill, medical camps, induction training and training on HSE at site.
- Shall ensure full co-operation during HQ/External /Customer HSE audits.

- Shall ensure submission of look-ahead plan for procurement of HSE equipment's and PPEs as per work schedule.
- Shall ensure good house keeping.
- Shall ensure adequate valid fire extinguishers are provided at the worksite.
- Shall ensure availability of sufficient number of toilets /restrooms and adequate drinking water at work site and labour colony.
- Shall ensure adequate emergency preparedness.
- Shall be member of site HSE committee and attend all meetings of the committee
- Power source for hand lamps shall be maximum of 24v.
- Temporary fencing should be done for open edges if handrails and railings and toe guards are not available.

7.3.2 HEALTH, SAFETY AND ENVIRONMENT OFFICER OF SUB-CONTRACTOR

- Carry out safety inspection of Work Area, Work Method, Men, Machine & Material, P&M and other tools and tackles.
- Facilitate inclusion of safety elements into Work Method Statement.
- Highlight the requirements of safety through Toolbox / other meetings.
- Help concerned HOS to prepare Job Specific instructions for critical jobs.
- Conduct investigation of all incident/ dangerous occurrences & recommend appropriate safety measures.
- Advice & co-ordinate for implementation of HSE permit systems, OCPs & MPs.
- Convene HSE meeting & minute the proceeding for circulation & follow-up action.
- Plan procurement of PPE & Safety devices and inspect their healthy ness.
- Report to PS Region/HQ on all matters pertaining to status of safety and promotional program at site level.
- Facilitate administration of First Aid
- Facilitate screening of workmen and safety induction.
- Conduct fire Drill and facilitate emergency preparedness
- Design campaigns, competitions & other special emphasis programs to promote safety in the workplace.
  - Apprise PS– Region on safety related problems.
- Notify site personnel non-conformance to safety norms observed during site visits/site inspections.
- 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.
- To decline acceptance of such PPE/safety equipment that do not conform to specified requirements.
- Encourage raising Near Miss Report on safety along with, improvement initiatives on safety.
- Shall work as interface between various agencies such customer, package-in-charges, Sub-contractor on HSE matters

8.0 PLANNING BY SUB CONTRACTOR

Monthly planning and review of HSE activities shall be carried out by Sub-contractor as per format No. HSEP:14-F30 jointly along with BHEL.

8.1 MOBILISATION OF MACHINERY/ EQUIPMENT /TOOLS & TACKLES BY SUB CONTRACTOR

- As a measure to ensure that machinery, equipment and tools & tackles being mobilized to the construction site are fit for purpose and are maintained in safe operating condition and complies with legislative and owner requirement, inspection shall be arranged by in-house competent authority for acceptance as applicable.

- The machinery and equipment to be embraced for this purpose shall include but not limited to the following:

  - Mobile Cranes & Hydra.
  - Side Booms.
  - Forklifts.
  - Grinding machine.
  - Drilling machine.
  - Air compressors.
  - Welding machine.
  - Generator sets.
  - Dump Trucks.
  - Excavators.
  - Dozers
  - Grit Blasting Equipment.
  - Hand tools.

- Sub-contractor shall notify the 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. 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 Sub-contractor shall strictly adhere to such instructions. 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.

8.2 MOBILISATION OF MANPOWER BY SUB CONTRACTOR

- The Sub-contractor shall arrange induction and regular health check of their employees as per schedule VII of BOCW rules by a registered medical practitioner.
- The Sub-contractor 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.
- 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.
- Appropriate accommodation to be arranged for all workmen in hygienic condition.

8.3 PROVISION OF PPEs

- Personnel Protective Equipment (PPEs), inadequate numbers, will be made available at site & the irregular use by all concerned will be ensured
- The following matrix recommends usage of minimum PPEs against the respective job.

Sl. No	Type of work	PPEs
1	Concrete and asphalt mixing	Nose mask, hand glove, apron and gum boot
2	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
3	Stone/ concrete breakers	Ear muffs, safety goggles, hand gloves
4	Electrical Work	Rubber hand glove, Electrical Resistance shoes
5	Insulation Work	Respiratory mask, Hand gloves, safety goggles
6	Work at height	Double lanyard full body harness, Fall arrestor (specific cases)
7	Grit/Sand blasting	Blast suit, blast helmet, respirator, leather gloves
8	Painting	Plastic gloves, Respirators (particularly for spray painting)
9	Radiography	As per BARC guidelines

- The PPEs shall conform to the relevant standards as below and bear ISI mark.

Relevant is-codes for personal protection

IS: 2925 – 1984	Industrial Safety Helmets.
IS: 4770 – 1968	Rubber gloves for electrical purposes.
IS: 6994 – 1973 (Part-I)	Industrial Safety Gloves (Leather &Cotton Gloves).
IS: 1989 – 1986 (Part-I-II)	Leather safety boots and shoes.
IS: 5557 – 1969	Industrial and Safety rubber knee boots.
IS: 6519 – 1971	Code of practice for selections care and repair of Safety footwear.
IS: 11226 – 1985	Leather Safety footwear having direct molding sole.
IS: 5983 – 1978	Eye protectors.
IS: 9167 – 1979	Ear protectors.
IS: 1179-1967	Eye & Face protection during welding
IS: 3521 – 1983	Industrial Safety Belts and Harness
IS:8519 -1977	Guide for selection of industrial Safety equipment for body protection
IS:9473-2002,14166-1994,14746-1999	Respiratory Protective Devices

The list is not exhaustive. The safety officer may demand additional PPEs based on specific requirement.

- Where workers are employed in sewers and manholes, which are in use, the sub-contractor 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
- Besides the PPEs mentioned above, the persons shall use helmet and safety shoe. The visitors shall use Helmet and any other PPEs as deemed appropriate for the area of work.

Colour scheme for Helmets:

1. Workmen: Yellow
2. Safety staff: Green or white with green band
3. Electrician: Red
4. Others including visitors: White

- All the PPEs shall be checked for its quality before issue and the same shall be periodically checked. The users shall be advised to check the PPEs themselves for any defect before putting on. The defective ones shall be repaired / replaced.
- The issuing agency shall maintain register for issue and receipt of PPEs.
- The Helmets shall have logo or name (abbreviation of agency name permitted) affixed or printed on the front.
- The body harnesses shall be serial numbered.

8.4 ARRANGEMENT OF INFRASTRUCTURE

8.4.1 DRINKING WATER

- Drinking water shall be provided and maintained at suitable places at different elevations.
- Container should be labeled as " Drinking Water"
- Cleaning of the storage tanks shall been ensured at least once in 3 months indicating date of cleaning and next due date.
- Potability of water should be tested as per IS 10500 at least once in a year.

8.4.2 WASHING FACILITIES

- In every workplace, adequate and suitable facilities for washing shall be provided and maintained.
- 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.
- Overalls shall be supplied by the sub-contractor to the workmen and adequate facilities shall be provided to enable the painters and other workers to wash during the cessation of work.

8.4.3 LATRINES AND URINALS

- Latrines and urinals shall be provided in every workplace.
- Urinals shall also be provided at different elevations.
- They shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times, by appointing designated person.
- Separate facilities shall be provided for the use of male and female worker if any.

8.4.4 PROVISION OF SHELTER DURING REST

Proper Shed & Shelter shall be provided for rest during break

8.4.5 MEDICAL FACILITIES

8.4.5.1 MEDICAL CENTRE (As per Schedule V, X and XI of BOCW central Rules,1998)

- A medical Centre shall be ensured/ identified at site with basic facilities for handling medical emergencies. The medical center can be jointly developed on proportionate sharing basis with permission from BHEL
- A qualified medical professional, not less than MBBS, shall be deployed at the medical centre
- The medical Centre shall be equipped with one ambulance, with trained driver and oxygen cylinder.
- Medical waste shall be disposed as per prevailing legislation (Bio-Medical Waste –Management and Handling Rules,1998)

8.4.5.2 FIRST AIDER

- Ensure availability of Qualified First-aider throughout the working hours.
- Every injury shall be treated, recorded and reported.
- Refresher course on first aid shall be conducted as necessary.
- List of Qualified first aiders and their contact numbers should be displayed at conspicuous places.

8.4.5.3 FIRST AID BOX (as per schedule III of BOCW)

- The Sub-contractor shall provide necessary first aid facilities as per schedule III of BOCW. At every work place first aid facilities shall be provided and maintained.
- The first aid box shall be kept by first aider who shall always be readily available during the working hours of the work place. His name and contact no to be displayed on the box.
- The first aid boxes should be placed at various elevations so as to make them available within the reach and at the quickest possible time.
- The first aid box shall be distinctly marked with a Green Cross on white background.
- Details of contents of first aid box is given in Annexure No.01
- Monthly inspection of First Aid Box shall be carried out by the owner as per format no. HSEP:14-F01
- The Sub-contractor should conduct periodical first aid classes to keep his supervisor and Engineers properly trained for attending to any emergency.

8.4.5.4 HEALTH CHECK UP (As per schedule VII and Form XI)

The persons engaged at the site shall undergo health checkup as per the format no.
HSEP:14-F02 before induction. The persons engaged in the following works shall undergo health checkup at least once in a year:

a. Height workers
b. Drivers/ Crane Operators/ Riggers

c. Confined space workers
d. Shot/sand blaster
e. Welding and NDE personnel

8.4.6 PROVISION OF CANTEEN FACILITY

- Canteen facilities shall be provided for the workmen of the project in side the project site.
- Proper cleaning and hygienic condition shall be maintained.
- Proper care should be taken to prevent biological contamination.
- Adequate drinking water should be available at canteen.
- Fire extinguisher shall be provided inside canteen.
- Regular health check-up and medication to the canteen workers shall be ensured.

8.4.7 PROVISION OF ACCOMODATION/ LABOUR COLONY

- The Sub-contractor shall arrange for the accommodation of workmen at nearby localities or by making a labour colony.
- Regular housekeeping of the labour colony shall be ensured.
- Proper sanitation and hygienic conditions to be maintained.
- Drinking water and electricity to be provided at the labour colony.
- Bathing/ washing bay
- Room ventilation and electrification.

8.4.8 PROVISION OF EMERGENCY VEHICLE

- Dedicated emergency vehicle shall be made available at workplace by each Sub-contractor to handle any emergency

8.4.9 INSECT AND PEST CONTROL

Regular insect//pest control (Mosquito, Snake, Honey bee should be carried out by sub- contractor at all of his site work area, offices, mainly
laboratories, canteen, labour colony and stores etc.

8.4.10 SCRAP YARD

- In consultation with customer, scrapyard shall be developed to store metal scrap, wooden scrap, waste, hazardous waste.
- Scrap/Waste shall be segregated as Bio-degradable and non-bio-degradable and stored separately.

8.4.11 ILLUMINATION

- The Sub-contractor shall arrange at his cost adequate lighting facilities e.g. flood lighting, hand lamps, area lighting etc. at various levels for safe and proper working operations at dark places and during night hours at the work spot as well as at the pre-assembly area.

- Adequate and suitable light shall be provided at all workplaces & their approaches including passage ways as per IS: 3646 (Part-II). Some recommended values are given below:

Sl. No.	Location	Illumination (Lux)
A.	**Construction Area**	
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.	rough measurements etc.	
8.	Fine work like precision assembly, precision measurements etc.	700
9.	Sheet metal works	200
10.	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

- Lamp (handheld) shall not be powered by mains supply but either by 24V or dry cells.
- Lamps shall be protected by suitable guards where necessary to prevent danger, incase of break age of lamp.
- Emergency lighting provision for night work shall be made to minimize danger in case of main supply failure.

If the Sub-contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions issued by the authorized BHEL official, BHEL shall have the right to take corrective steps at the risk and cost of the sub-contractor

9.0 HSE TRAINING & AWARENESS

9.1 HSE INDUCTION TRAINING

All persons entering into project site shall be given HSE induction training by the HSE officer of BHEL / Sub-contractor before being assigned to work.

In-house induction training subjects shall include but not limited to:

- Briefing of the Project details.
- Safety objectives and targets.
- Site HSE rules.
- Site HSE hazards and aspects.
- First aid facility.
- Emergency Contact No.
- Incident reporting.
- Fire prevention and emergency response.
- Rules to be followed in the labour colony (if applicable)

- 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.)
- They must arrive fully dressed in safety wear & gear to attend the induction.
- Any one failing to conform to this safety wear &gear requirement shall not qualify to attend.
- On completing attending sub contractor's in-house HSE induction, each employee shall sign an induction training form (format no. HSEP:14-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 worksite.

9.2 HSE TOOL BOX TALK

- HSE tool Box talk shall be conducted by frontline foreman/supervisor of Sub-contractor to specific work groups prior to the start of work. The agenda shall consist of the followings:
- Details of the job being intended for immediate execution.
- The relevant hazards and risks involved in executing the job and their control and mitigating measures.
- Specific site condition to be considered while executing the job like high temperature, humidity, unfavorable weather etc.
- Recent non-compliances observed.
- Appreciation of good work done by any person.
- Any doubt clearing session at the end.
- Record of Tool box talk shall be maintained as per format no. HSEP:14-F04
- Tool box talk to be conducted at least once a week for the specific work.

9.3 TRAINING ON HEIGHT WORK

- Training on height work shall be imparted to all workers working at height by in-house/external faculty at least once in a year. The training shall include following topics:
- Use of PPEs
- Use of fall arrester, retractable fall arrester, life line, safety nets etc.
- Safe climbing through monkey ladders.
- Inspection of PPEs.
- Medical fitness requirements.
- Mock drill on rescue at height.
- Dos & Don'ts during height work.

9.4 HSE TRAINING DURING PROJECT EXECUTION

- Other HSE training shall be arranged by BHEL/ Sub-contractor as per the need of the project execution and recommendation of HSE committee of site.
- The topics of the HSE training shall be as follows but not limited to:
- Hazards identification and risk analysis(HIRA)
- Work Permit System
- Incident investigation and reporting
- Fire fighting
- First aid
- Fire-warden training
- EMS and OHSMS
- T & Ps fitness and operation

- Electrical safety
- Welding, NDE & Radiological safety
- Storage, preservation & material handling.
- A matrix shall be maintained to keep an up-to-date record of attendance of training sessions carried out.

9.5 HSE PROMOTION- SIGNAGE, POSTERS, COMPETITION, AWARDS ETC

9.5.1 DISPLAY OF HSE POSTERS AND BANNERS

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

9.5.2 DISPLAY OF HSE SIGNAGE

- Appropriate HSE signage shall be displayed at the work area to aware workmen and passersby about the work going on and do's and don'ts to be followed

9.5.3 COMPETITION ON HSE AND AWARD

- Site will arrange different competition (slogan, poster, essay etc.) on HSE time to time (Safety day, BHEL day, World Environment Day etc.) and winners will be suitably awarded.

9.5.4 HSE AWARENESS PROGRAMME

- Sub-contractor shall arrange HSE awareness programme periodically on different topics including medical awareness for all personnel working at site

10. HSE COMMUNICATION

10.1 INCIDENT REPORTING

- The Sub-contractor shall submit report of all incidents, fires and property damage to the Engineer immediately after such occurrence, but in any case not later than 24 hours of the occurrence. Such reports shall be furnished in the manner prescribed by BHEL. (Refer HSE procedure for incident investigation, analysis and reporting for details)
- In addition, periodic reports on safety shall also be submitted by the sub-contractor to BHEL from time to time as prescribed by the Engineer. Compiled monthly reports of all kinds of incidents, fire and property damage to be submitted to BHEL safety officer as per prescribed formats.
- HSE incidents of site shall be reported to BHEL site Management as per Procedure for Incident Investigation and Reporting in format no.HSEP:14-F15. Corrective action shall be immediately implemented at the workplace and compliance shall be verified by BHEL HSE officer and until then, work shall be put on hold by Construction Manager.

10.2 HSE EVENT REPORTING

- Important HSE events like HSE training, Medical camp etc. organized at site shall be reported to BHEL site management in detail with photo graphs for publication in different in-house magazines
- Celebration of important days like National Safety Day, World Environment Day etc. shall also be reported as mentioned above.

10.3 MONTHLY, WEEKLY, DAILY, HSE ACTIVITY REPORTING

Monthly, Weekly & Daily HSE activities shall be reported by Sub-contractor to BHEL as per formats issued by BHEL from time to time (as for example refer to Format No. HSEP: 14-F31A).

10.4 ACCIDENT INVESTIGATION

- The sub-contractor should conduct a thorough, proper, unbiased & scientific accident investigation after Every accidents at site. The accident/ incident shall be investigated by a team of Contractor's senior Site personnel (involving Site-in-Charge or at least by his deputy) for establishing root-cause and recommending corrective & preventive actions. Findings shall be documented and suitable actions taken to avoid recurrences shall be communicated to BHEL/Owner.
- Sub-contractor should actively participate & co-operate (means provide manpower and other resources) in accident investigation committees, RCA (root case analysis) committee etc formed by BHEL/Owner.
- Sub-contractor should preserve documents/evidence related with accidents until an accident investigation is completed.
- BHEL shall have the liberty to independently investigate such occurrences and the sub-contractor shall extend all necessary help and cooperation in this regard. BHEL shall have the right to share the content of this report with the outside world.

10.5 HSE DOCMENTATION

- The sub-contractor shall evolve a comprehensive, planned and documented system covering the following as a minimum for implementation and monitoring of the HSE requirements and the same shall be submitted for approval by BHEL/Owner

  HSE Organizational chart
  Site Specific HSE Plan
  Safety Procedures, forms and Checklist. Indicative list of HSE procedures/Format is attached as Appendix
  Inspections and Test Plan
  Risk Assessment & Job Safety Analysis for critical works.

- The monitoring for implementation shall be done by sub-contractor after regular inspections and compliance of the observations thereof.

- However, compliance of HSE requirements shall be the responsibility of the Contractor. Any review/approval by BHEL / Owner shall not absolve sub-contractor of his responsibility/ liability in relation to fulfilling all HSE requirements.

10.6 OCCUPATIONAL HEALTH

- The contractor shall identify all operations that can adversely affect the health of its workers and issue & implement mitigation measures.
- For surface cleaning operations, sand blasting shall not be permitted even if not explicitly stated elsewhere in the contract.
- To eliminate radiation hazard, Tungsten electrodes used for Gas Tungsten Arc Welding shall not contain Thorium.
- Appropriate respiratory protective devices(hood with respiratory devices) shall be used to protect workmen from inhalation of air borne contaminants like silica, asbestos, gases, fumes, etc.
- Workmen shall be made aware of correct methods for lifting, carrying, pushing & pulling of heavy loads. Wherever possible, manual handling shall be replaced by mechanical lifting equipments.
- For jobs like drilling/demolishing/dismantling where noise pollution exceeds the specified limit of 85 decibels, ear muffs shall be provided to the workers
- To avoid work related upper limb disorders (WRULD) and backaches, Display Screen equipments workplace stations shall be carefully designed & used with proper sitting postures. Power driven hand-held tools shall be maintained in good working condition to minimize their vibrating effects and personnel using these tools shall be taught how to operate them safely & how to maintain good blood circulation in hands.

- The Contractor shall arrange health check up (by registered medical practitioner) for all the workers at the time of induction. Health check may have to be repeated if the nature of duty assigned to him is changed necessitating health check or doubt arises about his wellness.

- BHEL/Owner reserves the right to ask the contractor to submit medical test reports. Regular health check-ups are mandatory for the workers assigned with Welding, Radiography, Blasting, Painting, Heavy Lift and Height (>1.8m) jobs. All the health check-ups shall be conducted by registered Medical practitioner and records are to be maintained by the Contractor.

11.0 OPERATIONAL CONTROL PROCEDURES

All applicable OCPs (Operational control procedures) will be followed by sub-contractor as per BHEL instructions. This will be done as part of normal scope of work. List of such OCPs is given below. In case any other OCP is found to be applicable during the execution of work at site ,then sub-contractor will follow this as well, within quoted rate. These OCPs (applicable ones) will be made available to Sub-contractor during work execution at site. However for reference purpose, these are kept with Safety Officer of BHEL at the Power Sector Regional HQ, or available in downloadable format in the website, which may be refereed by sub-contractor, if they so desire.

LIST OF OCPs

Safe handling of chemicals	Safety in use of cranes	Hydraulic test
Electrical safety	Storage and handling of gas cylinders	Spray insulation
Energy conservation	Manual arc welding	Trial run of rotary equipment
Safe welding and gas cutting operation	Safe use of helmets	Stress relieving
Fire safety	Good house keeping	Material preservation
Safety in use of hand tools	Working at height	Cable laying/tray work
First aid	Safe excavation	Transformer charging
Food safety at canteen	Safe filling of hydrogen in cylinder	Electrical maintenance
Illumination	Vehicle maintenance	Safe handling of battery system
Handling and erection of heavy metals	Safe radiography	Computer operation
Safe acid cleaning	Waste disposal	Storage in open yard
Safe alkali boil out	Working at night	For sanitary maintenance
Safe oil flushing	Blasting	Batching
Steam blowing	DG set	Piling rig operation
Safe working in confined area	Handling & storage of mineral wool	Gas distribution test
Safe operation of passenger lift, material hoists & cages	Drilling, reaming and grinding(machining)	Cleaning of hotwell / deaerator
Electro-resistance heating	Compressor operation	O&M of control of AC plant & system
Air compressor	Passivation	Safe Loading of Unit
Safe EDTA Cleaning	Safe Chemical cleaning of Pre boiler system	Safe Boiler Light up
Safe Rolling and Synchronization		

11.1 HSE ACTIVITIES

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

1) HSE Procedure for Register of OHS Hazards and Risks
2) HSE Procedure for Register of Environmental Aspects and Impacts
3) HSE Procedure for Register of Regulations

4) Operational Control Procedures
5) HSE Procedure for Emergency Preparedness and Response Plan
6) Contract documents

11.2 WORK PERMIT SYSTEM

The following activities shall come under Work Permit System
a. Height working above 1.8 meters
b. Hot working at height
c. Confined space
d. Radiography
e. Excavation more than 1.5 meter depth
f. Heavy lifting above 20 ton
Refer Annexure 05 for Work permit formats.

- "HSE Procedure for Work Permit System"shallbefollowedwhileimplementingpermitsystem.Wherecustomer is having separate Work Permit System the same shall be followed.
  - Permit applicant shall apply for work permit of particular work activity at particular location before starting of the work with Job Hazard Analysis.
  - Permit signatory shall check that all the control measures necessary for the activity are in place and issue the permit to the permit holder.
  - Permit holder shall implement and maintain all control measures during the period of permit .He will close the permitaftercompletionofthework.TheclosedpermitshallbearchivedinHSEDepartmentofsite.

11.3 SAFETY DURING WORK EXECUTION

Respective OCPS are to be followed and adherence to the same would be contractually binding

11.3.1 WELDING AND GAS CUTTING SAFETY

All safety precautions shall be taken for welding and cutting operations as per IS-818. All safety precautions shall be taken for foundation and other excavation marks as per IS-3764.

- Use trolleys and cradles of adequate strength, as far as possible, while moving the cylinders.
- Always keep LPG and other liquefiable gas cylinders in upright position and ensure that they are not knocked over
- Check that the valves of the gas cylinders are lightly shut when not in use.
- Do not release gas from the cylinder unless pressure regulator is fitted to its valve.
- Use gas hoses specially designed for the purpose with standard colour code
- Use proper clamps for hose connections, check leakage from hose connections before starting work. Never use steel wires for clamping.
- Take care that there are no kinks in the hoses and the hoses are laid such that nobody steps on the hoses and these do not get damaged due to activities in progress in the vicinity.
- Use flame flash back arrestors for both end such as torch and gas cylinder to avoid back firing in flammable gas cylinders.
- Open the valve of oxygen gas first and then flammable gas for lighting the torch
- Use friction gas lighters only for lighting the torch. Never use matches for smoldering manila ropes or rags for lighting the torch.
- Protect the gas cylinders and hoses from welding sparks or gas cutting sparks falling on them

- Ensure that the valve key is easily accessible to close the valve immediately in case of emergency.
- Never crimp the hose for temporary shutting of gas. Always shut the supply through pressure regulators.
- Check the hoses daily for any visible damage. Discard the hoses in which gas had backfired.
- Remove the leaking cylinder of flammable gas immediately to an open space where it is least dangerous to life and property. Intimate the supplier of the cylinder.
- Ensure use of aprons, gloves and other PPE as appropriate.

11.3.2 RIGGING SAFETY

Rigging equipment shall not be loaded in excess of its recommended safe working load. Rigging equipment when not in use, shall be removed from the original work area so as not to present a hazard to employees.

11.3.3 CYLINDERS STORAGE AND MOVEMENT

- All gas cylinders shall be stored in up right position.
- Suitable trolley shall be used.
- There shall be flash-back arrestors conforming to IS-11006 at both cylinder and burner ends.
- Damaged tube and regulators must be immediately replaced.
- No of cylinders shall not exceed the specified quantity as per OCP
- 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
- When cylinders are transported by powered vehicle they shall be secured in a vertical position.

11.3.4 DEMOLITION WORK

- Before any demolition work is commenced and also during the process of the work the following shall be ensured:
- All roads and open areas adjacent to the work site shall either be closed or suitably protected.
- 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.
- 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 over loaded with debris or materials as to render them unsafe.
- Before commencement of demolition work, permission/permit should be taken from Owner/Consultant.

11.3.5 T&Ps

All T&Ps/ MMEs should be of reputed brand/appropriate quality &must have valid test/calibration certificates bearing endorsement from competent authority (TPI) of BHEL. Sub-contractor to also submit monthly reports of T&Ps deployed and validity test certificates to BHEL safety Officer as per the format/procedure of BHEL.

11.3.6 CHEMICAL HANDLING

Displaying safe handling procedures for all chemicals such as lube oil, acid, alkali, sealing compounds etc, at workplace. Where it is necessary to provide and/or store petroleum products or petroleum mixture & explosives, the Sub-contractor 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 Sub-contractor shall be responsible for obtaining the same. MSDS should be displayed at site.

11.3.7 ELECTRICAL SAFETY

A. Providing adequate no. of 24V sources and ensure that no hand lamps are operating at voltage level above 24 Volts.

B. Fulfilling safety requirements at all power tapping points.

C. High/ Low pressure welders to be identified with separate colour clothing. No welders will be deployed without passing appropriate standard holding valid welding certificates. Approved welding procedure should be displayed at workplace.

D. The sub-contractor shall not use any hand lamp energized by Electric power with supply voltage of more than 24 volts in confined spaces like inside water boxes, turbine casings, condensers etc.

E. All portable electric tools used by the Sub-contractor shall have safe plugging system to source of power and be appropriately earthed.

F. Only experienced electricians with a valid license by appropriate statutory authority shall be employed by the Sub-contractor to carry out all types of electrical works.

G. Details of earth resource ad their test date to be given to BHEL safety officer as per the prescribed formats of BHEL

H. The Sub-contractor shall use only properly insulated and armored cables which conform to the requirement of Indian

I. Electricity Act and Rules for all wiring, electrical applications at site. BHEL reserves the right to replace any unsafe electrical installations, wiring, cabling etc. at the cost of the subcontractor.

J. All electrical appliances used in the work shall be in good working condition and shall be properly earthed.

K. No maintenance work shall be carried out on live equipment.

L. The Sub-contractor shall maintain adequate number of qualified electricians to maintain his temporary electrical installations.

M. Area wise Electrical safety inspection is to be carried out on monthly basis as per “Electrical Safety Inspection checklist’ and the report is to be submitted to BHEL safety officer

N. 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 place as to caused anger or in convenience to any person or the public

O. The Sub-contractor shall carefully follow the safety requirement of BHEL/ the purchaser with the regard to voltages used in critical are as.

11.3.8 SHOT BLASTING

Blasting is a specialized job involved a lot of hazards which often lead to accidents. There are many forms of risk associated with blasting work. Before beginning the work, employers should identify the hazards and assign a knowledgeable person who know the functioning of shot blasting machine trained to recognize hazards and with the authority to quick take corrective actions to remove them.

Safety measures should be taken before using shot blasting machine are:

A. Provide training to shot blasters and support personnel on blasting health and safety hazards how to use control, personal hygiene practices and safe work practices.

B. Safety Points Before Using Shot Blasting Machine

C. Shot blasting operation can create a high level of dust and noise. shot blasting material and the surface being blasted may contain toxic materials that are harmful to workers. So respirator masks/helmet and safety glasses should be used to protect against nuisance type dust. Also must cover the worker's head ,neck and shoulder to protect the worker from rebounding abrasive.

D. Review the blast area and security plan because the blast area is the area having the potential for flying material air overpressure can cause injury to a person. Review the communicating system used between blaster and blast area security personnel.

E. Ensure that Machine is in good condition, fuel system of the machine is free from leakage. Blaster should be experienced.

F. Use blast room or blast cabinet for smaller operations. Use restricted areas for non-enclosed blasting operations. Use exhaust ventilation system.

G. Acknowledge the shot is properly loaded and secured. Steel grit shot have less potential to cause lung damage. So always use less toxic shots blasting material. Always use blasting material that can be delivered with water to reduce dust.

H. Do not use compressed air to clean as this will create dust in the air. To prevent the spread of any hazardous material we should avoid blasting in windy conditions.

I. Compressor for shot blasting should have a valid TPI.

11.3.9 FIRE SAFETY

A. Providing appropriate firefighting equipment at designated workplace and nominate fire officer/ warden adequately trained for his job.

B. Sub-contractor shall provide enough fire protecting equipment of the types and numbers at his office, stores, temporary structure in labor colony etc. Such fire protection equipment shall be easy and kept open at all times.

C. 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.

D. 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.

E. Non-compliance of the above requirement under fire protection shall in no way relieve the Sub-contractor of any of his responsibility and liabilities to fire incident occurring either to h is materials or equipment or those of others.

F. Emergency contacts numbers must be displayed at prominent locations

G. 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.

H. Correct type & required quantity of fire extinguishers and sand bucket should be provided at appropriate locations.

I. Material storage area should have adequate fire fighting arrangement like fire extinguishers /sand buckets etc.

J. Material storage area should have some person designated as fire watcher.

11.3.10 OPERATIONAL CONTROL PROCEDURE OF RADAIOGARPHY

A. Exposure to penetrating radiation from Radioactive Isotopes and other source is becoming more and more pronounced in the construction field.

B. A couple of decades ago, radioactive sources, used, were comparatively 'mild' and less encountered. With the growing demand of weld joint inspection, metal thickness / flaw determination, liquid level measurement in High temperature / pressure process vessels etc., the use and application of the radioactive sources specially, Y-radiation, has increased considerably.

C. However, the protection and procedure for work safety and personnel protection have warranted very little basic changes

D. Atomic Energy authorities have been alert and alive to the situation Well organized and efficient monitoring, controlled operation and rescue / recovery system has been developed and enforced. Some of these are:-

E. Authorized person obtains all Radioactive Isotopes from BARC (Bhabha Atomic Research Centre, Mumbai) only

F. Transportation and storage specifications and standards are rigidly monitored and enforced by the authorities.

G. Any mishap, loss or damage is promptly attended to and rectified by the authorities, immediately on receipt of information.

H. They promptly and formally collect all isotopes reaching their Half-life stage.

Site requirements for the safe use of field personnel are as follows:

1. Isotope storage – a designated and certified location should be maintained properly with prescribed warning board and fencing.
2. Personnel using the Isotope must be medically checked before being permitted to handle and found fit.
3. They must have a valid BARC certificate for safe handling of Isotopes.
4. They must use a film Badge or Dosimeter as prescribed by the authorities while working with Isotopes.
5. Isotope attached to a metal pencil should be removed from storage only for the optimum period of work.
6. Isotope MUST not be taken out of the container lead pot till actual exposure stage is reached. The exposure time must be calculated beforehand.
7. Ensure radiation monitoring equipment is working, when exposure is in progress.
8. On expiry of the exposure time, the source must immediately be put back in the container.
9. All personnel working with radiation sources must maintain the prescribed safe distance at all stages of work.
10. Isotopes Pencil must be handled by a Collimator or monitoring rod of specified length, to avoid any unsafe proximity to the operator's body.

11. Isotopes or the pencil should never be touched by hand or allowed to come in contact with body.

12. The area of work must be cordoned for a minimum radius of 10m for a Y-ray Isotope of about 3 C (S.A) and more as the strength – "Specific Activity" of the source, demands. Specified warning Boards MUST be installed adequately around the cordoned area.

13. If an isotope is damaged or lost: a) Immediately seal the working / suspected areas for all traffic, pedestrian or vehicle. b) Do not remove any materials tools, containers, vehicles – anything from the suspected area. Inform BARC Authorities – Radiation Protection, Directorate of Atomic Energy.

14. Keep strict watch till the authorities arrive. The authorities will locate and dispose off the offending isotope. On no account site people or any other persons – except BARC designated personnel – should attempt to recover the lost isotope. Suspected over exposure of any personnel must be reported to medical Centre immediately.

15. On a routine basis: All personnel attached to the radiography / radiometer crew must have prescribed medical check-ups.

16. Dosimeter / film badges must be returned to BARC for processing. Safe exposure dosage for each individual over different time stages – fortnightly, monthly, annually are predetermined and compared against actual exposures. □ If a person is over exposed at any time he should be: a) Taken off Radiography / Radiometry work. b) Assigned other duties as advised by doctor. He has no cause for panic. A careful handling and strict observance of precautionary measures.

11.3.11 SCAFFOLDING

A. Suitable scaffolds shall be provided for workman for all works that cannot safely be done from the ground, or from solid construction except in the case of short duration of work which can be done safely from ladders.

B. When a ladder is used, it shall be of rigid construction made of steel. The steps shall have a minimum width of 45 cm and a maximum rise of 30 cm. Suitable handholds of good quality wood or steel shall be provided and the ladder shall be given an inclination not steeper then ¼ horizontal and 1 vertical.

C. Scaffolding or staging more than 3.6 m above the ground floor, swung or suspended from an overhead support or erected with stationery support shall have a guard rail properly bolted, braced or other wise secured, at least 90cm above the floor or platform of such scaffolding or staging and extending along the entire length of the out side and ends there of with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from saver, from swaying, from the building or structure.

Requirements for different types of Scaffolds:
Suspended Scaffold

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

E. Requirements for use are to be pre approved by HSE Head, under a specific Permit to Work.

F. Rolling Scaffolds

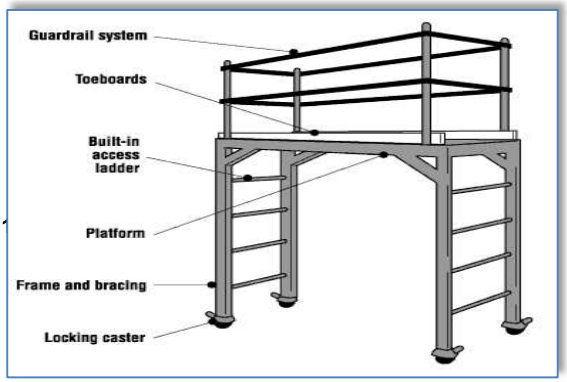
G. The height of rolling scaffolds shall not exceed three times the minimum base dimension.

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

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

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

K. 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.



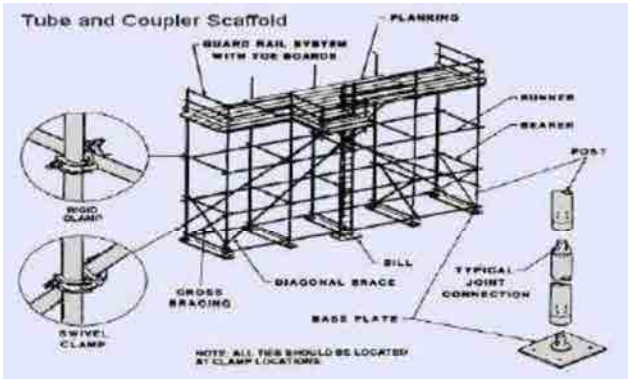


Fig. 13.2.1.3 Types of Scaffolds

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

- Guard rails and toe-board/ barricades and sound platform conforming to IS:4912-1978 should be provided.
- All workers on job are medically fit for working at height (Person should not have vertigo)
- Where ever necessary, life-line (pp or metallic) and fall arrestor along with Poly amide rope or Retractable lifeline should be provided.
- Safety Net as per IS:11057: 1984 should be used extensively for prevention/ arrest of men and materials falling from height. The safety netsshallbefireresistant,dulytestedandshallbeofISImarkedandthenetsshallbelocatedasper site requirements to arrest or to reduce the consequence sofa possible fall of persons working at different heights.
- 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 short cut must be discouraged.
- Use of Rebar steel for making Jhoola and monkey-ladder (Rods welded to vertical or inclined structural members), temporary platform etc. must be avoided.
- Monkey Ladder should be properly made and fitted with cages.
- Jhoola should be made with angles and flats and tested like any lifting tools before use with valid TPI.
- Lanyard must be anchored always and in case of double lanyard, each should be anchored separately.
- In case of pipe-rack, persons should not walk on pipes and walk on plat forms only.
- In case of roof work, walking ladder/platform should be provided along with life line and /or fall arrestor.
- Empty drums must not be used.
- For chimney or structure painting, both hanging platform and men should be anchored separately to a firm structure along with separate fall arrestor. Rope ladder should be discouraged

11.3.12 SAFETY HARNESS, LANYARD, LIFELINE & LIFELINE POST

- 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.

LANYARD

- 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.

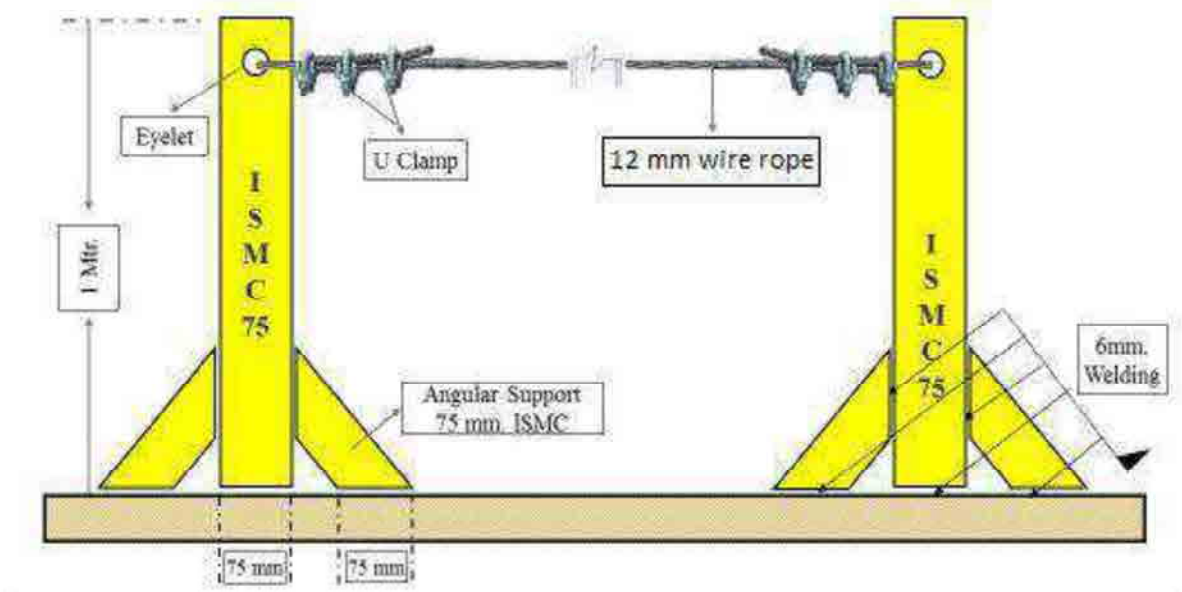
- Lanyards and lifelines must incorporate, or be used with, an appropriate deceleration (shock absorbing) device.
- Deceleration devices include rope grabs, rip-stitch lanyards, specially woven lanyards, tearing, or deforming lanyards, automatic self-retracting lifelines and lanyards which dissipate or limit the energy imposed on the employee during fall arrest.
- 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.

LIFELINE

- All lifelines in general are to be made of min 8/12 mm 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.

LIFELINE POST

DIAGRAM : LIFELINE POST



- 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
- 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
- The lifeline need not be wrapped / clamped to any intermediate post
- Such intermediate posts must be used at an interval of every 6 meters
- The post(s) in which the original lifeline is to be installed should be capable of sustaining a tensile stress of 2268 Kgs.
- In a horizontal lifeline installation, maximum allowable sagging is 500-600 mm
- For a single spun lifeline, no more than 2 persons are allowed to work; for more than two workers, another lifeline should be installed
- Horizontal lifeline should be so installed that it does not impede safe movement of workers
- All the installation work must be carried out by competent person with adequate knowledge

11.3.13 WORKING PLATFORM

A. 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 as described above. Every opening in the floor or a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 90 cm.

11.3.14 EXCAVATION

A. Where ever there are open excavation in ground, they shall be fenced off by suitable railing and danger signals installed at night so as to prevent persons slipping into the excavations.
B. The following safety measures are to be ensured before and during excavation:
C. All Excavation activities more than with depth of 1.5 meter or more shall require and Excavation Work Permit
D. 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
E. Proper and adequate slope is maintained while excavating
F. Adequate shoring or sheeting is done wherever require to prevent soil sliding
G. Safe access through ladder or steps for exit & entry to excavation
H. No material /excavated soil is kept within one meter from the edge
I. Safe way is planned and provided for movement of HEM /transport equipment near excavation
J. Safety helmet and shoes/gum boots are provided and worn by the workmen at excavation works
K. Dewatering arrangement is made where water seepage is prevailed.
L. Stop blocks are provided to avoid vehicles reversing into the excavated trenches
M. Danger signs /Caution boards are displayed at work spot
N. Hard Barricading is provided at excavated pits.

11.3.15 LADDER SAFETY

A. Safe means of access shall be provided to all working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 m in the length while the width between side rails in rung ladder shall in no case be less than app.
B. 29.2 cm for ladder up to and including 3 m in length.
C. For longer ladders this width shall be increased at least ¼'' for each additional foot of length.
D. A sketch of the ladders and scaffolds proposed to be used shall be prepared and approval of the Engineer obtained prior to Construction.
E. Ladder should be extended up to 01 meter

11.3.16 LIFTING SAFETY

A. It will be the responsibility of the sub-contractor to ensure safe lifting of the equipment, taking due precaution to avoid any incident and damage to other equipment and personnel.

B. All requisite tests and inspection of handling equipment, tools & tackle shall be periodically done by the sub-contractor by engaging only the Competent Persons as per law.

C. Defective equipment or uncertified shall be removed from service.

D. Any equipment shall not be loaded in excess of its recommended safe working load.

11.3.17 HOISTING APPLIANCES

A. Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards.
B. Hoisting appliance should be provided with such means as will reduce to the minimum the risk of any part of as suspended load becoming incidentally displaced.
C. When workers employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves and boots as may be necessary should be provided.
D. The worker should not wear any rings, watches and carry keys or other materials which are good conductor of electricity.

11.3.18 GRINDING SAFETY

A. Grinders shall be equipped with the 'dead man switch'.
B. All handheld grinding machines shall be complete with handle or commonly known as the 'T' bar. Removal of the handle during use is strictly prohibited.
C. Each grinding machine shall be fitted with its correct guard as supplied by the manufacturer, to protect against flying particles.
D. All pedestal/static grinding machines must have an efficient starting and stopping device, which is easily accessible.
E. Each grinding machine shall be inspected regularly.
F. Abrasive wheels, grinding or cutting discs without the manufacturer's maximum RPM marked shall not be used.
G. Grinding and cutting discs are different in the manufacture and shall therefore only be used for its intended purpose.
H. Cutting wheel is only allowed for cutting do not do grinding using cutting wheel, chances of breaking.
I. They shall be stored separately and physically identified to avoid selection error.
J. Proper PPE, including double eye protection such as the use of goggles underneath of a shatter-resistant face shield and an inhalation mask such as dust mask, Leather gloves shall be worn by all personnel operating grinding machines.
K. Work areas around pedestal / static abrasive wheels equipment shall be kept clear of obstructions to reduce the risk of tripping hazards.
L. Cables shall be run neatly in a manner and shall hang on insulated hangers that do not cause tripping hazards.
M. When changing the grinding disc of the grinder, the power source shall be isolated and the plug physically removed.
N. Expiry year of shall be visible on the disk. Do not use an expired grinding disk. & do not use a wheel without an expiry date.
O. Subjected Work-pieces shall be secured using proper clamps. Holding the work piece onto one hand while performing grinding operations is strictly prohibited.
P. Due to the possibility of a wheel dis integrating during start-up, employees shall be briefed not to stand directly in front of the wheel as it accelerates to full operating speed.
Q. Worn out / damaged, grinding or cutting disc shall be replaced. When changing the disc, proper tools shall be use.
R. All worn out / damaged, grinding or cutting disc shall be returned to the stores to ensure that they are dispose of properly.
S. The power source shall be isolated and the plug physically removed while not in operation.

11.3.19 DRILLING SAFETY

A. Run drill at correct RPM for diameter of drill bit and material. Ask shop personnel for the correct RPM.
B. Always hold work in a vise or clamp to the drill table.
C. Use a correctly ground drill bit for the material being drilled. Shop personnel can help select the correct bit.
D. Use the proper cutting fluid for the material being drilled. Ask the shop staff about the appropriate fluid for the material you are machining.
E. Remove chips with a brush, never by hand.
F. Ease up on drilling pressure as the drill starts to break through the bottom of the material.
G. Do not use a dull or cracked drill. Inspect the drill before using.
H. Do not drill with too much pressure.

I. Always try to support part on parallels or a backing board when drilling thru material.
J. Never place taper shank tools such as large diameter drills or tapered shank reamers in a drill chuck. Only straight shank tools such as standard drills can be clamped in chucks.
K. Always clean drill shank and/or drill sleeve, and, spindle hole before mounting.
L. Remove taper shank tools from spindle or sleeve with a drill drift and hammer.
M. Never try to loosen the drill chuck while the power is on.
N. Lower the drill spindle close to the table when releasing the drill chuck or taper shank drill to reduce the chance of damage should they fall onto the table.
O. Never clean a machine while it is in motion!!
P. If the drill binds in a hole, stop the machine and turn the spindle backwards by hand to release the bit.
Q. When drilling a deep hole withdraw the drill bit frequently to clear chips and lubricate the bit.
R. Always remove the drill chuck key, or, the drill drift from the spindle immediately after using it.
S. Wear safety eye protection while drilling.
T. Let the spindle stop of its own accord after turning the power off. Never try to stop the spindle with your hand.

11.3.20 WEATHER PROTECTION

A. Contractor shall take appropriate measures to protect workers from severe storms, rain, solar radiations, poisonous gases, dust, etc. by ensuring proper usage of PPEs like Sun glasses, respirators, dust masks, etc. and rearranging/ planning the construction activities to suit the weather conditions. Effective arrangement (without creating inconvenience to project facilities & permanent installations) for protecting workmen from hailstorm, drizzle in the form of temporary shelter may be made at site.

11.3.21 WORKING AT HEIGHT

A. The Contractor shall issue permit for working (PFW) at height after verifying and certifying the checkpoints as specified in the relevant permit format. He shall also undertake to ensure compliance to the conditions of the permit during the currency of the permit including adherence of personal protective equipment(s). Contractor's Safety Officer shall verify compliance status of the items of permit document after implementation of action is completed by Contractor's execution / field engineers at work site.

B. All personnel shall be medically examined & certified by registered doctor, confirming their 'medical fitness for working at height. The fitness examination shall be done once in a year.

C. The Contractor shall arrange (at his cost) and ensure use of Fall Arrester Systems by his workers. Fall arresters are to be used while climbing/descending tall structures or vessels / columns etc. These arresters should lock automatically against the anchorage line, restricting free fall of the user. The device is to be provided with a double security opening system to ensure safe attachment or release of the user at any point of rope. In order to avoid shock, the system should be capable of keeping the person in vertical position in case of a fall.

D. The Contractor shall ensure that Full body harnesses conforming relevant IS standard is used by all personnel while working at height. The lanyards and life lines should have enough tensile strength to take the load of the worker in case of a fall.

E. One end of the lanyard shall be firmly tied with the harnesses and the other end with life line. The harness should be capable of keeping the workman vertical in case of a fall, enabling him to rescue himself.

F. The Contractor shall ensure that a proper Safety Net System is used wherever the hazard of fall from height is present. The safety net, preferably a knotted one with mesh ropes conforming to IS 5175/ISO 1140 shall have a border rope & tie cord of minimum 12 mm dia. The Safety Net shall be located not more than 6.0 meters below the working surface extending on either side up to sufficient margin to arrest fall of persons working at different heights.

G. In case of accidental fall of person on such Safety Net, the bottom most portion of Safety Net should not touch any structure, object or ground.

H. The Contractor shall ensure positive isolation while working at different levels like in the pipe rack areas. The working platforms with toe boards & hand rails shall be sufficiently strong & shall have sufficient space to hold the workmen and tools & tackles including the equipment required for executing the job. Such working platforms shall have mid-rails, to enable people work safely in sitting posture.

I. For steel wire rope type (plastic coated type) life line thickness should of Life lines should be minimum 12 mm or 8 mm (as per job requirement).

J. Lifelines should be tied to a standard / rigid post.

11.3.22 PROPER ACCESS / EGRESS (ACCESSIBILITY)

A. The Contractor shall provide safe means of access (in sufficient numbers) & efficient exit to any working place including provisions of suitable and sufficient scaffolding/ramps/steps/ ladders at various stages during all operations of the work for the safety of his workmen and owner/ client.

B. The Contractor shall implement use of all measures including use of "life line", "fall- arresters", "retractable fall arresters", "safety nets" etc. during the course of using all safe accesses & exits, so that in no case any individual remains at risk of slip & fall during their travel.

C. Safe access & egress arrangements (e.g. ladders, fall arresters, life-liners etc) should be satisfactorily incorporated

D. Access / egress to Electrical Distribution Boards / Panels should be clear from wires / cables / earth-strips etc.

E. The access to operating plant / project complex shall be strictly regulated. Any person or vehicle entering such complex shall undergo identification check, as per the procedures in force / requirement at project site.

F. Accessibility to 'confined space' shall be governed by specific system / regulation, as established at project site.

11.3.23 HEAVY LIFTINGS

A. The BHEL Sub-contractor shall submit detailed lifting plan for BHEL /Owner approval prior to lifting equipment which is 20 ton or more

B. Or any other lift which is of complex dimension (constraints of its dimensions, location of foundation height, approach & weight.) /shape/ or very expensive in nature.

C. Contractor shall obtain lifting permit before such lifting (e.g HSE-15 "Permit for heavy lift/critical erection")

D. Prior to actual lifting activities, contractor shall check the validity of the crane/T&P Third party inspection (TPI) certificate issued by statutory/ competent authority. This requirement shall also apply to all lifting equipment utilized for the job.

E. The Sub-contractor shall, at all times, be responsible for all lifting/rigging activities.

F. The Sub-Contractor shall ensure medical fitness of all workmen who are engaged/involved in erection of equipment, vessels etc. and such fitness checks shall be carried-out every six months interval with the help of a registered medical practitioner & record shall be maintained.

G. Adequate safety measures such as positive barricading, usage of appropriate PPEs, permit to work, etc. shall be taken during all heavy or critical lifts.

H. Crane operators should be experienced & medically fit. They should also posses valid driving license and eye test Report/ Certificate.

11.3.24 LIFTING TOOLS & TACKLES

A. Lifting tools/tackles, machinery, accessories etc. shall be inspected, tested and examined by competent people (approved by concerned State authorities-TPI) before being used at site and also at periodical interval (e.g. during replacement, extension, modification, elongation/ reduction of machine/parts, etc.) as per relevant statutes. Hydra, cranes, lifting machinery, mobile equipment / machinery / vehicles, etc. shall be inspected regularly by only competent / experienced personnel at site and requisite records for such inspections shall be maintained by every contractor. Contractor shall also maintain records of maintenance of

11.3.25 HEAVY VEHICLES

A. The sub-contractor should ensure all statutory compliance of heavy vehicles (e.g Dumper, Truck, Excavator, Crane , Hydra etc) used at construction site like valid RC, Insurance, PUC, etc

B. The vehicles shall be fitted with reverse warning alarms & flashing lights / fog-lights and usage of seat belts shall be ensured.

C. Vehicles shall be properly maintained and appropriate maintenance records should be kept.

D. For Cranes, Hydras Third Party inspections (TPI) by competent person should be done once a year.

E. In case of Cranes & hydras overload protection device (SLI) (mechanical or electronic) as per possibility should be ensured.

F. Presence of over hoist protection device should be ensured.

11.3.26 SAFETY DURING INSULATION WORK

A. Insulation job workers should be given proper PPEs (e.g. nose mask, goggles, hand globe) as per job requirement

B. Entry to insulation Area should be restricted

C. Area properly barricaded by the means of caution tapes

D. After finish of insulation work excess insulation wools should be properly disposed off.

11.3.27 SAFETY DURING HYDRAULIC/ PNEUMATIC PRESSURE TESTING WORK

A. Sub-contractor should follow appropriate safety guidelines / relevant BHEL OCPs during Hydraulic / Pneumatic Pressure Testing job.

B. No unauthorized persons should be present near to such work area.

11.4 ENVIRONMENTAL CONTROL

A. Environment protection has always been given prime importance by BHEL. Environmental damage is a major concern of the principal sub-contractor and every effort shall be made, to have effective control measures in place to avoid pollution of Air, Water and Land and associated life. Chloro fluoro carbons such as carbon tetra chloride and tri chloro ethylene shall not be used. Waste disposal shall be done in accordance with the guidelines laid down in the project specification.

B. Any chemical including solvents and paints, required for construction shall be stored in designated bonded areas around the site as per Material Safety Data Sheet (MSDS).

C. 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. The Sub-contractor shall use appropriate MSDS for clean-up technique

D. All Sub-contractor shall be responsible for the cleanliness of their own areas.

E. The Sub-contractor shall ensure that noise levels generated by plant or machinery are as low as reasonably practicable. Where the Sub-contractor anticipates the generation of excessive noise levels from his operations the Sub-contractor shall inform to Construction Manager of BHEL accordingly so that reasonable & practicable precautions can be taken to protect other persons who may be affected.

F. It is imperative on the part of the Sub-contractor to join and effectively contribute in joint measures such as tree plantation,

environment protection, contributing towards social up liftment, conversion of packing woods to school furniture, keeping good relation with local populace etc.

G. The Sub-contractor shall carry out periodic air and water quality check and illumination level checking in his area of work place and take suitable control measure.

11.5 HOUSE KEEPING

E. Keeping the area clean/free from debris, removed scaffoldings, scraps, insulation /sheeting wastage/ cut pieces, temporary structures, packing woods etc. will be in the scope of the sub-contractor. Such cleanings has to be done daily/weekly/ or as per site requirement by Sub-contractor within quoted rate, by an identified group.

F. If such activity is not carried out by sub-contractor / BHEL is not satisfied, then BHEL may get it done by other agency and actual cost along with BHEL overheads will be deducted from contractor's bill. Such decisions of BHEL shall be binding on the subcontractor

G. Proper house keeping to be maintained at work place and the following are to be taken care of on daily basis.

H. All surplus earth and debris are removed/ disposed off from the working areas to identified locations.

I. Unused/ Surplus cables, steel items and steel scrap lying scattered at different places/elevation within the working areas are removed to identified locations.

J. 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

K. Different work places for easy collection of scrap/waste. Scrap chute shall be installed to remove scrap from high location.

L. Access and egress (staircase, gangways, ladders etc.) path should be free from all scrap and other hindrances.

M. Work men shall be educated through tool box talk about the importance of housekeeping and encourage not to litter.

N. Labour 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.

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

P. 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.

Q. Utmost care shall be taken to ensure overall cleanliness and proper upkeep of the working areas

11.6 WASTE MANAGEMENT

Take suitable measures for waste management and environment related laws/legislation as a part of normal construction activities. 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.

11.6.1 BINS AT WORKPLACE

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

11.6.2 STORAGE AND COLLECTION

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

11.6.3 SEGREGATION

- Earmark the scrap area for different types of waste.
- Store wastes away from building.
- Oil spill absorbed by non-combustible absorbent should be kept in separate bin.
- Clinical and first aid waste stored and incinerated separately.

11.6.4 DISPOSAL

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

11.6.5 WARNING AND SIGNS

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

11.7 TRAFFIC MANAGEMENT SYSTEM

11.7.1 SAFE WORK PLACE TRANSPORT SYSTEM (ROAD/ RAIL SAFETY)

- Traffic routes in a work place shall be suitable for the persons or vehicles using them. This shall be sufficient in number and of sufficient size. This shall reflect the suitability of traffic routes for vehicles and pedestrians.
- Where vehicles and pedestrians use the same traffic routes there shall be sufficient space between them. Where necessary all traffic routes must be suitably indicated. Pedestrians or vehicles must be able to use traffic routes without endangering those at work. There must be sufficient separation of traffic routes from doors, gates and pedestrian traffic routes.
- For internal traffic, lines marked on roads / access routes and between buildings shall clearly indicate where vehicles are to pass.
- Temporary obstacles shall be brought to the attention of drivers by warning signs or hazard cones.
- Speed limits shall be clearly displayed. Speed ramps preceded by a warning signs or marker are necessary.
- 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.
- Safest route shall be provided between places where vehicles have to call or deliver.
- Avoid vulnerable areas/items such as fuel or chemicals tanks or pipes, open or unprotected edges and structures likely to collapse

- Safe areas shall be provided for loading and unloading.
- Avoid sharp or blind bends. If this is not possible hazards should be indicated e.g. blind corner.
- Ensure road crossings are minimum and clearly signed.
- Entrance and gate ways shall be wide enough to accommodate a second vehicle without causing obstruction.
- Set sensible speed limits which are clearly sign posted.
- Where necessary ramps should be used to retard speed. This shall be preceded by a warning sign or mark on the road.
- Forklift trucks shall not pass over road hump unless of a type capable of doing so.
- Overhead electric cable, pipes containing flammable hazardous chemical shall be shielded by using goal posts height gauge posts or barriers.
- Road traffic signs shall be provided on prominent locations for prevention of incidents and hazards and for quick guidance and warning to employees and public.
- Safety signs shall be displayed as per the project working requirement and guideline of the state in which project is done. 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.
- For area where Rail lines also present at construction site, appropriate Rail safety guideline issued by BHEL/ Owner should be followed.

11.7.2 TRAFFIC ROUTE FOR PEDESTRIANS/ ROAD SAFETY

- Where traffic routes are used by both pedestrians and vehicles road shall be wide enough to allow vehicles and pedestrians safely.
- 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.
- Where pedestrian and vehicle routes cross, appropriate crossing shall be provided.
- Where crowd is likely to use road way e.g. at the end of shift, stop vehicles from using them at such times.
- Provide high visibility clothing for people permitted in delivery area.

11.7.3 WORK VEHICLE

Work vehicle shall be as safe stable efficient and roadworthy as private vehicles on public roads. Site management shall ensure that drivers are suitably trained. All vehicle e.g. heavy motor vehicle forklift trucks dump trucks mobile cranes shall ensure that the work equipment conforms to the following:

- A high level of stability.
- A safe means of access/egress.
- Suitable and effective service and parking brakes.
- Windscreens with wipers and external mirrors giving optimum all round visibility.
- Provision of horn, vehicle lights, reflectors, reversing lights, reversing alarms.
- Provision of seatbelts.
- Guards on dangerous parts.
- Driver protection to prevent injury from overturning and from falling objects /materials.
- Driver protection from adverse weather.
- No vehicle shall be parked below HT/ LT power lines.
- Valid Pollution Under Control certification for all vehicles

11.7.4 DAILY CHECK BY DRIVER

- There should also be daily safety checks containing below mentioned points by the driver before the vehicle is used.
  - Brakes.
  - Tires.
  - Steering.
  - Mirrors.
  - Windscreen waters.
  - Wipers.
  - Warning signals.
  - Specific safety system i.e. control inter locks
  - Sub contractor should ensure that drivers carry out these checks

11.7.5 STATUTORY COMPLIANCE OF TRANSPORTATION OF PERSONNEL AND MATERIALS BY VEHICLES

- All drivers shall hold a valid driving License for the class of vehicle to be driven and be registered as an authorized driver with the Administration Department.
- 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.
- All overhangs shall be made clearly visible and restricted to acceptable limits
- Load shall be checked before moving off and after traveling a suitable distance.
- On no account I construction site to be blocked by parked vehicles Drivers of vehicles shall only stop or park in the areas designate by the stringing fore man.
- Warning signs shall be displayed during transportation of material.
- All vehicles used shall be in worthy condition and in conformance to the Land Transport requirement.

11.7.6 MAINTENANCE OF VEHICLES

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.

11.8 EMERGENCY PREPAREDNESS AND RESPONSE

- Emergency preparedness and response capability of site shall be developed as per Emergency Preparedness and Response plan issued by Regional HQ
- Availability of adequate number of first aiders and fire warden shall be ensured with BHEL and its sub-contractors
- All the sub-contractor'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. Sub-contractor should nominate is supervisor to coordinate and implement the safety measures.
- Emergency assembly point shall be earmarked and access to the same from different location shall be shown
- Fire exit shall be identified and pathway shall be clear for emergency escape.

- Appropriate type and number of fire extinguisher shall be deployed as per Fire extinguisher deployment plan and validity shall be ensured periodically through inspection
- Adequate number of first aid boxes shall be strategically placed at different work places to cater emergency need. Holder of the first aid box shall be identified on the box it self who will have the responsibility to maintain the same.
- First aid center shall be developed at site with trained medical personnel and ambulance
- Emergency contact numbers (format given in EPRP) of the site shall be displayed at prominent locations.
- Tie up with fire brigade shall be done in case customer is not having fire station.
- Tie up with hospital shall be done in case customer is not having hospital.
- Disaster Management group shall be formed at site
- Mock drill shall be arranged at regular intervals. Monthly report of the above to be given to BHEL safety Officer as per prescribed BHEL formats
- Mock drill shall be conducted on different emergencies periodically to find out gaps in emergency preparedness and taking necessary corrective action

12.0 HSE INSPECTION

Inspection on HSE for different activities being carried out at site shall be done to ensure compliance to HSE MS requirements. The Sub-contractor shall maintain and ensure necessary safety measures as required for inspection and tests HV test, Pneumatic test, Hydraulic test, Spring test, Bend test etc. as applicable, to enable inspection agency for performing Inspection. If any test equipment is found not complying with proper safety requirements then the Inspection Agency may with hold inspection, till such time the desired safety requirements are met.

12.1 DAILY HSE CHECKS

Both the Site Supervisors and safety officer of Sub-contractor 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:

- Personal Safety wears & gear compliance.
- Complying with site safety rules and permit-to-work (PTW).
- Positions and postures of workers.
- Use of tools and equipment etc. by the workers.
- The inspection should 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.

12.2 INSPECTION OF PPE

- PPEs shall be inspected by HSE officer at random once in a week as per format no. HSEP:14-F06 for its compliance to standard and compliance to use and any adverse observation shall be recorded in the PPE register.
- The applicable PPEs for carrying out particular activities are listed below.

12.3 INSPECTION OF T&Ps

- A master list of T&Ps shall be maintained by each subcontractor.
- All T&Ps being used at site shall be inspected by HSE officer once in a month as per format no. HSEP:14-F07 for its healthiness and maintenance.
- 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.
- The validity of T&P shall be monitored as per "Status of T&Ps" format no.HSEP:14-F08

12.4 INSPECTION OF CRANES AND WINCHES

- 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.
- Cranes and Winches shall be inspected by HSE officer once in a month as per format no. HSEP:14-F09 for healthiness, maintenance and validity of third party inspection.
- The date of third party inspection and next due date shall be painted on cranes and winches.
- The operators /drivers shall be authorized by sub-contractor based on their competency and experience and shall carry the I-card.
- 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 checklist.

12.5 INSPECTION OF HEIGHT WORKING

- Inspection on height working shall be conducted daily by supervisors before start of work to ensure safe working condition including provision of
    - Fall arrestor
    - Lifelines
    - Safety nets
    - Fencing and barricading
    - Warning signage
    - Covering of opening
    - Proper scaffolding with access and egress.
    - Illumination
- Inspection on height working shall be conducted once in a week by HSE officer as per format no. HSEP:14-F10.
- Medical fitness and vertigo test of height worker shall be ensured.
- Height working shall not be allowed during adverse weather.

12.6 INSPECTION OF WELDING AND GAS CUTTING OPERATION

- Supervisor shall ensure that no flammable items are available in near vicinity during welding and gas cutting activity.
- Gas cylinders shall be kept up right.
- Use of Flash back arrestor shall be ensured at both ends.

- Inspection during welding and gas cutting operations shall be carried out by HSE officer once a month as per format no.HSEP:14-F11.
- Use of fire blanket to be ensured to avoid falling of splatters during welding or gas cutting operation at height.
- Availability of fire extinguisher at vicinity shall be ensured.

12.7 INSPECTION OF ELECTRICAL INSTALLATION / APPLIANCES

- Ensure proper earthing in electrical installation
- Use ELCB at electrical booth
- Electrical installation shall be properly covered at top where required
- Use appropriate PPEs while working
- Use portable electrical light <24V in confined space and potentially wet area.
- Monthly inspection shall be carried out as per format no.HSEP:14-F12.

12.8 INSPECTION OF ELEVATOR

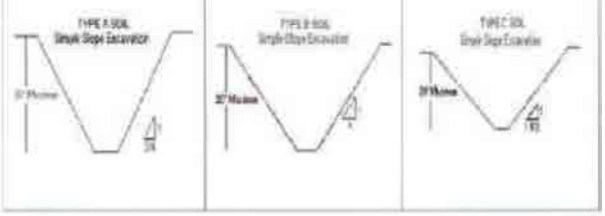
- Elevators shall be inspected by concerned supervisors once in a week as per format no. HSEP:14-F13.
- All elevators shall be inspected by competent person(TPI) and validity shall be ensured.
- The date of third party inspection and next due date shall be painted on elevator.

12.9 INSPECTION OF EXCAVATION

Excavation activities shall be inspected as per Format HSEP:14-F13A

A. The following safety measures are to be ensured before and during excavation:
B. All Excavation activities more than with depth of 1.22 meter or more shall require and Excavation Work Permit
C. Check for underground utilities like electrical / telephone cables, sewage, water lines and proper care has to be exercised to protect and prevent damage.
D. Proper and adequate slope is maintained while excavating
E. Adequate shoring or sheeting is done wherever require to prevent soil sliding
F. Safe access through ladder or steps for exit & entry to excavation
G. No material /excavated soil is kept within one meter from the edge
H. Safe way is planned and provided for movement of HEM /transport equipment near excavation
I. Safety helmet and shoes/gum boots are provided and worn by the workmen at excavation works
J. Dewatering arrangement is made where water seepage is prevailed.
K. Stop blocks are provided to avoid vehicles reversing into the excavated trenches
L. Danger signs /Caution boards are displayed at work spot
M. Hard Barricading is provided at excavated pits. It should be made of scaffolding pipe and clamp with reflective nets.
N. Trial Trench if required. Cable/Metal detector required for under ground services.

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.

12.10 LIFTING & RIGGING SAFETY

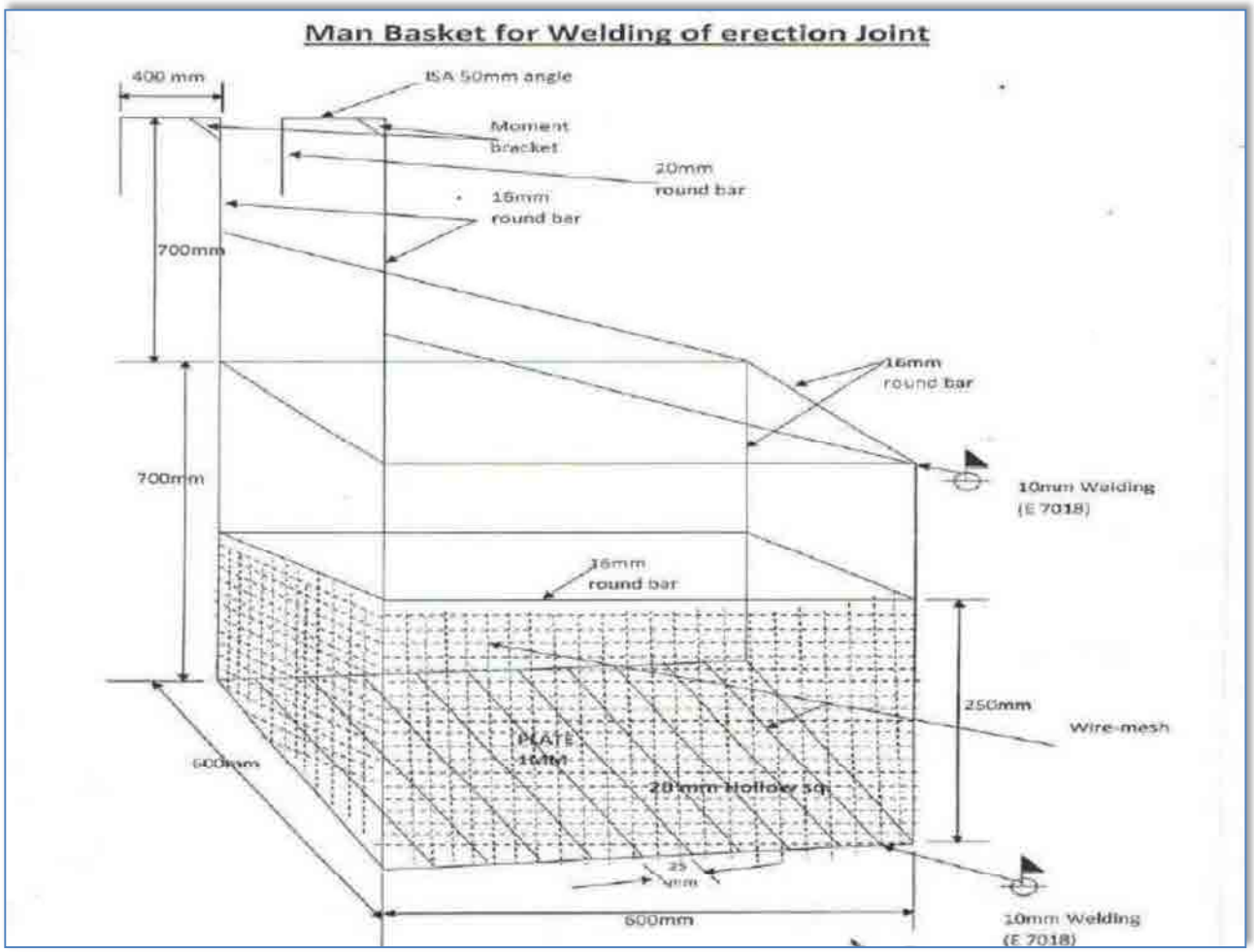
A. All Heavy / Complex Lifting operations as defined in Clause 6.12 shall require a Lifting Work Permit. A written rigging procedure and plan must be prepared for all individual heavy/ complex lifting operations.
B. All the cranes and lifting tools & tackles shall be inspected on daily / weekly basis as well as monthly by expert as per applicable formats.
C. 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
D. 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.

Following requirements shall be mandatorily followed, wherever applicable:

E. The manufacturer's instruction for maintenance shall also be followed. All safety measures shall be followed.
F. All tools tackles, lifting appliances; material-handling equipment etc. used by the Sub-contractor shall be of safe design and construction.
G. The operators, slingers and signalers shall be qualified as per IS 13367 (part-1):2003 "Safe use of cranes- code of practices".
H. There shall be a person responsible for co-ordination among cranes where multiple cranes are used, and lifting over 75% of the crane capacity to be avoided.
I. Mobile phone should be banned for crane operator and lifting operation. Only walkie talkie shall be allowed in rigging/Lifting purpose.
J. 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:

K. An equipment rigging plan is not required for lifts less than 5 tons, safety measures are covered in the JSA.
Personnel Lifts (Man-Basket / Jhoola):
L. 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.
M. 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.
N. Man-basket shall be used where access through ladders or scaffolding is not feasible.
O. 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.
P. 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%.
Q. It shall have a door with double latches and shall open inside. Anchor points shall be identified within the man-basket.
R. The man-basket shall be thoroughly inspected and load tested and a trial run performed without personnel before being put to job.
S. It shall be treated as a lifting tool (T&P Item) and shall undergo same certification cycle and inspection as other lifting equipment.
T. 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.
U. While lifting man-basket, the crane shall maintain a uniform speed of lift without any swing.
V. 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. 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.
W. Use of Rebar steel for making and monkey-ladder must be avoided.



13.0 HSE PERFORMANCE

- Contractor shall be assessed on monthly basis for HSE Compliance by BHEL Safety In-charge at site. The HSE compliance shall be based on Online HSE Evaluation System of BHEL as per Format No. HSEP: 14-F33.
- BHEL shall reserve the right to use this assessment for evaluating bidder's capacity for future tenders
- Suitable HSE reward system shall be developed at site level to promote HSE compliance amongst workmen by the sub-contractor. To decide HSE reward, performance towards HSE shall be evaluated for workmen and it shall be awarded regularly in public gathering.
- If safety record of the sub-contractor 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 sub contractor may be considered by BHEL after completion of the job.

13.1 SAFETY DURING 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 Synchronization and Full loading of unit.
- These activities shall be personally supervised by the site executive along with the commissioning engineer.
- Appropriate Work Permits shall be taken as applicable
- The readiness of upstream and downstream system shall be ensured before taking up.
- 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.
- 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.
- Tag-in/ Tag-out shall be in place while charging transformer and whenever necessary.
- Electricians with valid wiremen license only shall be permitted to work on power lines.
- The area and the passage shall be adequately illuminated
- Siren/Hooter for alerting workers during steam blowing should be ensured.

14.0 HSE PENALTIES

A. As per contractual provision HSE penalties shall be imposed on Sub-contractor for non-compliance on HSE requirement as per format no. HSEP: 14-F14.The list in the format is only indicative. For any other violation, not listed in the format, the minimum penalty amount is to be decided as per BOCW act.

B. **If principal customer/ statutory and regulatory bodies impose some penalty on HSE due to the non-compliance of the sub-contractor the same shall be passed on to them**.

C. The penalty amount shall be recovered by Site Finance department from sub-contractor's RA / Final bill.

D. The Contractor shall adhere consistently to all provisions of HSE requirements. In case of non-compliances and also for repeated failure in implementation of any of the HSE provisions, DASTUR/Owner may impose stoppage of work without any cost & time implication to the Owner and/or impose a suitable penalty. The amount of penalty to be levied against defaulted Contractor shall be up to a cumulative limit of:

E. This penalty shall be in addition to all other penalties specified elsewhere in the contract. The decision of imposing stop-work-instruction and imposition of penalty shall rest with Owner. The same shall be binding on the BHEL sub contractor. Imposition of penalty does not make the Contractor eligible to continue the work in unsafe manner.

F. The amount of penalty applicable for (penalty by OWNER/CONSULTANT) on the Contractor on different types of HSE Violations is specified below:

Sl. No.	Violation of HSE Norms	Penalty Amount
1	For not using personal protective equipment (Helmet, Shoes, Goggles, Gloves, Full body harness, Face shield, Boiler suit, etc.)	Rs. 500/- per day/Item / Person.
2	Working without Work Permit/Clearance	Rs. 20000/- per occasion
3	Execution of work without deployment of requisite field engineer / supervisor at work spot	Rs. 5000/- per violation per day
4	Unsafe electrical practices (not installing ELCB, using poor joints of cables, using naked wire without top plug into socket, laying wire/cables on the roads, electrical jobs by incompetent person, etc.)	Rs. 10000/- per item per day.
5	Working at height without full body harness, using day. non-standard/ rejected scaffolding and not arranging fall protection arrangement as required, like hand- rails, life-lines, Safety Nets etc.	Rs. 10000/- per case per
6	Unsafe handling of compressed gas cylinders trolley, jubilee clips double gauge regulator, and not keeping cylinders vertical during storage/handling, not using safety cap of cylinder).	Rs. 500/- per item per day.
7	Use of domestic LPG for cutting purpose / not using flash back arresters on both the hoses/tubes on both ends.	Rs. 3000/- per occasion.
8	No fencing/barricading of excavated areas /trenches.	Rs. 3000/- per occasion.

9	Not providing shoring/strutting/proper slope and not keeping the excavated earth at least 1 .5M away from excavated area.	Rs. 5,000/- per occasion
10	Non display of scaffold tags, caution boards, list of hospitals, emergency services available at work locations.	Rs. l000/- per occasion per day

15.0 OTHER HSE REQUIREMENTS

- 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 notifying the sub-contractor suitably.
- If the Sub-contractor fails to improve the standard s of safety in its operation to the satisfaction of BHEL after being given reasonable opportunity to do so and/or if the sub-contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instruction regarding safety issued by BHEL, BHEL shall have the right to take corrective steps at the risk and cost of the sub-contractor after giving a notice of not less than 7 days indicating the steps that would be taken by BHEL.
- If the Sub-contractor succeeds in carrying out its job in time without any fatal or disabling injury incident and with out any damage to property BHEL may, at its sole discretion, favorably consider to reward the sub-contractor suitably for the performance.
- In case of any damage to property due to lapses by the subcontractor, BHEL shall have the right to recover the cost of such damages from the sub-contractor after holding an appropriate enquiry.
- The su-contractor shall take all measures at the sites of the work to protect all persons from incidents and shall be bound to bear the expenses of defense of every suit, action or other proceeding of law that may be brought by any persons for injury sustained or death owing to neglect of the above precautions and to pay any such persons such compensation or which may with the consent of the Sub-contractor be paid to compromise any claim by any such person, should such claim proceeding be filed against BHEL, the Sub-contractor hereby agrees to indemnify BHEL against the same.
- The Sub-contractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, overalls shall be supplied by the Sub-contractor to the workmen and adequate facilities shall be provided to enable the working painters to wash during the cessation of work.
- The sub contractor shall notify BHEL of his intention to bring to site any equipment or material which may create hazard.
- BHEL shall have the right to prescribe the conditions under which such equipment or materials may be handled and the sub-contractor shall adhere to such instructions.

15.1 BEHAVIOUR BASED SAFETY

The contractor shall develop a system to implement Behaviour-Based Safety (BBS) through which work groups can identify measure and change the behaviours of employees and workers. **The BBS process shall include the following:**

A. Identify the behaviours critical to obtaining required safety performance.

B. Communicate the behaviours and how they are performed correctly to all.

C. Observe the work force and record safe/at risk behaviours. Intervene with workers to give positive reinforcement when safe behaviours are observed. Provide coaching/correction when risky behaviors are observed.

D. Collect and record observation data.

E. Summarize and analyze observation data.

F. Communicate observation data and analysis results to all employees.

G. Provide recognition or celebrate when safe behaviour improvements occur.

H. Change behaviours to be observed or change activators or change consequences as appropriate.

I. Communicate any changes to workforce

Contractor through its own HSE committee shall implement the above process. The necessary procedures and reporting formats shall be developed by the contractor for approval by Owner. The HSE committee of contractor shall observe individual's behavior for safe practices adapted for utilization/execution of work for following as a minimum:

- PPE
- Tools & equipment
- Hazard Identification & control
- House keeping
- Confined space entry
- Hot works
- Excavation
- Loading & unloading
- Work at height
- Stacking & storage
- Ergonomics
- Procedures

15.2 SLIPS, TRIPS & FALLS

The contractor shall establish a regular cleaning and basic housekeeping programme that covers all aspects of the workplace to help minimize the risk of slips, trips & falls. The contractor shall take positive measures like keeping the work area tidy, storing waste in suitable containers & harmful items separately, keeping passages, stairways, entrances & exits especially emergency ones clear, cleaning up spillages immediately and replacing damaged carpet/floor tiles, mats & rugs at once to avoid slips, trips & falls.

15.3 RADIATION EXPOSURE

- All personnel exposed to physical agents such as ionizing & non-ionizing radiation, including ultraviolet rays or similar other physical agents shall be provided with adequate shielding or protection commensurate with the type of exposure involved.

- For Open Field Radiography works, requirements of Bhabha Atomic Research Centre (BARC)/Atomic Energy Regulatory Board (AERB) shall be followed.

- The Contractor shall implement an effective system of control (as described in the AFRB regulations) at site for handling radiography-sources & for avoiding its misuse & theft.
- The contractor shall generate the Format No: HSE-8 "Permit for radiation work" before start of work.
- In case the radiography work has to be carried out at day time, suitable methodology to be used so that other works, people are not affected

15.4 DEMOLITION/ DISMANTLING

- The contractor shall adhere to safe demolishing/dismantling practices at all stages of work to guard against unsafe working practices.
- The contractor shall disconnect service lines (power, gas supply, water, etc.)/make alternate arrangements prior to start of work and restore them, if required as directed by DASTUR/Owner at no extra cost.
- Before carrying out any demolition/dismantling work, the contractor shall take prior approval of Owner and generate the Format No.HSE-9. For revamp jobs in operating plants where location of underground utilities is not known with certainty, the contractor shall depute an experienced engineer for supervision and shall make adequate arrangements for Fire fighting & First-Aid during the execution of these activities.
- The Contractor shall arrange approved Job Safety Analysis (JSA) / Method Statement for the specific demolition / dismantling task. In no case any activity related to demolition/dismantling shall be carried out by the Contractor without engaging own supervision / field engineer.

15.5 HSE AWARENESS AND MOTIVATION

- The Contractor shall promote and develop awareness on Health, Safety and Environment protection among all personnel working for the Contractor.
- Regular awareness programs and fabrication shop / work site meetings at least on monthly basis shall be arranged on HSE activities to cover hazards/risks involved in various operations during construction.
- Contractor to motivate & encourage the workmen & supervisory staff by issuing / awarding them with tokens/gifts/mementos/monetary incentives/certificates, etc.

15.6 INTOXICATING DRINKS & DRUGS AND SMOKING

- The Contractor shall not allow any workman to commence any work at any locations of project activity who is/ are influenced / effected with the intake of alcohol, drugs or any other intoxicating items being consumed prior to start of work or working day.
- Awareness about local laws on this issue shall form part of the Induction Training and compulsory work-site discipline.
- The Contractor shall ensure that all personnel working for him comply with "No-Smoking" requirements of the Owner a notified from time to time. Cigarettes, lighters, auto ignition tools or appliances as well as intoxicating drugs, dry tobacco powder, etc. shall not be allowed inside the project/plant complex.
- Smoking shall be permitted only inside smoking area exclusively designated for.

15.7 ADDITIONAL SAFETY REQUIREMENTS FOR WORKING INSIDE A RUNNING PLANT

As a minimum, the contractor shall ensure adherence to following safety requirements while working in or in the close vicinity of an operating plant. Contractor shall obtain permits for Hot work, Cold work, Excavation and Confined Space from Owner in the prescribed format.

A. The contractor shall monitor record and compile list of his workers entering the operational plant/unit each day and ensure & record their return after completing the job.

B. Contractor's workers and staff members shall use designated entrances and proceed by designated routes to work areas only assigned to them. The workers shall not be allowed to enter units' area, tanks area, pump rooms, etc. without work authorization permit.

C. Work activities shall be planned in such a way so as to minimize the disruption of other activities being carried out in an operational plant/unit and activities of other contractors.

D. The contractor shall submit a list of all chemicals/toxic substances that are intended to be used at site and shall take prior approval of the Owner.

E. Specific training on working in a hydrocarbon plant shall be imparted to the work force and mock drills shall be carried out for Rescue operations/First-Aid measures.

F. Proper barricading/cordoning of the operational units/plants shall be done before starting the construction activities. No unauthorized person shall be allowed to trespass. The height and overall design of the barricading structure shall be finalized in consultation with the Owner and shall be got approved from the Owner.

G. Care shall be taken to prevent hitting underground facilities such as electrical cables, hydrocarbon piping during execution of work.

H. Barricading with water curtain shall be arranged in specific/critical areas where hydrocarbon vapors are likely to be present such as near horton spheres or tanks. Positioning of fire tenders (from owner) shall also be ensured during execution of critical activities.

I. Emergency evacuation plan shall be worked out and all workmen shall be apprised about evacuation routes. Mock drill operations may also be conducted.

J. Flammable gas test shall be conducted prior to any hot work using appropriate measuring instruments. Sewers, drains, vents or any other gas escaping points shall be covered with flame retardant tarpaulin.

K. Respiratory devices shall be kept handy while working in confined zones where there is a danger of inhalation of poisonous gases. Constant monitoring of presence of Gas/ Hydrocarbon shall be done.

L. Clearance shall be obtained from all parties before starting hot tapping, patchwork on live lines and work on corroded tank roof.

M. Positive isolation of line/equipment by blinding for welding/cutting/grinding shall be done. Closing of valve will not be considered sufficient for isolation.

N. Welding spatters shall be contained properly and in no case shall be allowed to fall on the ground containing oil. Similar care shall be taken during cutting operations.

O. The vehicles, cranes, engines, etc. shall be fitted with spark arresters on the exhaust pipe and got it approved from Safety Department of the Owner.

P. Plant air should not be used to clean any part of the body or clothing or use to blow off dirt on the floor.

Q. Gas detectors should be installed in gas leakage prone areas as per requirement of Owner's plant operation personnel.

R. Experienced full time safety personnel shall be exclusively deployed to monitor safety aspects in running plants.

15.8 CONFINED SPACE ENTRY

The sub-contractor shall generate a work before entering a confined space. People, who are permitted to enter into confine space, must be medically examined & certified by registered doctor, confirming their 'medical fitness for working in confined space. All necessary precautions mentioned therein shall be adhered to. An attendant shall be positioned outside a confined space for extending help during an emergency. All appropriate PPEs and air quality parameters shall be checked before entering a confined space. It shall be ensured that the piping of the equipment which has to be opened is pressure-free by checking that blinds are in place, vents are open and volume is drained. Inside confined space works, only electrical facilities / installations of 24V shall be permitted. Contactor shall ensure usage of safe & suitable arrangement of oxygen supply for individual workmen (during the course of work in confined space), if oxygen concentration is found to be less than 19.5% (v/v) there.

15.9 SCAFFOLDINGS & BARRICADING

Suitable scaffoldings shall be provided to workmen for all works that cannot be safely done from the ground or from solid construction except such short period work that can be safely done using ladders or certified (by 3rd

party competent person) man-basket. When a ladder is used, an extra workman shall always be engaged for holding the ladder.

The Contractor shall ensure that the scaffolds used during construction activities shall be strong enough to take the designed load. All scaffolds shall be inspected by a competent Scaffolding Inspector of the Contractor. He shall paste a GREEN tag (duly signed by competent Scaffolding Inspector) on each scaffold found safe aid a RED tag (duly signed by competent Scaffolding Inspector) on each scaffold found unsafe. Scaffolds with GREEN tag only shall be permitted to be used and Scaffolds with RED ones shall immediately be made inaccessible. Work being found continuing on scaffolds with RED tag shall be considered unauthorized work by Contractor and may invite penalization from BHEL/Owner. For every 120-125 m2 /m3 area / volume or its parts thereof minimum one TAG shall be provided.

The Contractor shall ensure positive barricading (indicative as well as protective) of the excavated, radiography, heavy lift, high pressure hydrostatic & pneumatic testing and other such areas. Sufficient warning signs shall be displayed along the barricading areas.

Scaffolding shall be constructed using foot seals or base plates only.

15.10 ELECTRICAL INSTALLATIONS

- All electrical installations/ connections shall be carried out as per the provisions of latest revision of following codes/standards, in addition to the requirements of Statutory Authorities and IE/applicable international rules & regulations:
- O1SD STD 173:- Fire prevention & protection system for electrical installations
- SP 30 (BIS):- National Electric Code
- All electrical installations shall be approved by the concerned statutory authorities.
- All temporary electrical installations / facilities shall be regularly checked by the licensed/competent electricians of the Contractor and appropriate records shall be maintained in format no: HSE-12" Inspection of temporary electrical booth/installation at project construction site". Such inspection records are to be made available to BHEL/Owner, whenever asked for.

15.11 WELDING/ GAS CUTTING

- Contractor shall ensure that flash back arrestors conforming to BS: 6158 or equivalent are installed on all gas cylinders as well as at the torch end of the gas hose, while in use.
- All cylinders shall be mounted on trolleys and provided with a closing key. Empty & filled-up gas cylinders shall be stored separately with TAG, protecting them from direct sun or rain. Minimum 2 nos. of Portable DCP type fire extinguishers (10 kg) shall be maintained at the gas cylinder stores. Stacking & storing of compressed gas cylinders shall be arranged away from DG set, hot works, Elect. Panels / Elec. boards, etc
- The burner and the hose placed downstream of pressure reducer shall be equipped with Flash Back Arrester/Non Return Valve device.
- The hoses for acetylene and oxygen cylinders must be of different colours. Their connections to cylinders and burners shall be made with a safety collar.
- At end of work, the cylinders in use shall be closed and hoses depressurized.
- Cutting of metals using gases, other than oxygen & acetylene, shall require written concurrence from Owner.
- All welding machines shall have effective earthing at least at distinctly isolated two points.
- In order to help maintain good housekeeping, and to reduce fire hazard, live electrode bits shall be contained safely and shall not be thrown directly on the ground.
- The hoses of Acetylene and Oxygen shall be kept free from entanglement & away from common pathways / walkways and preferably be hanged overhead in such a manner which can avoid contact with cranes, hydra or other mobile

construction machinery.

- Hot spatters shall be contained / restricted appropriately (by making use of effective fire- retardant cloth/fabric) and their flying-off as well as chance of contact with near-by flammable materials shall be stopped.
- The Contractor shall arrange adequate systems & practices for accumulation / collection of metal & other scraps and remnant electrodes and their safe disposal at regular interval so as to maintain the fabrication and other areas satisfactorily clean & tidy.
- All gas cylinders must have a cylinder cap on at all times when not in use.

15.12 ERGONOMICS OF TOOLS & TACKLES

A. The Contractor shall assign to his workmen, tasks commensurate with their qualification, experience and state of health.

B. All lifting tools, tackles, equipment, accessories including cranes shall be tested periodically by statutory/competent authority(TPI) for their condition and load carrying capacity. Valid test & fitness certificates from the applicable authority shall be submitted to Owner/DASTUR for their review/acceptance before the lifting tools, tackles, equipment, accessories and cranes arc used.

C. The contractor shall not be allowed to use defective equipment or tools not adhering to safety norms.

D. Contractor shall arrange non-sparking tools for project construction works in operating plant areas / hydrocarbon prone areas.

E. Wherever required the Contractor shall make use of Elevated Work Platforms (EWP) or Aerial Work Platforms (mobile or stationary) to avoid ergonomical risks and workmen shall be debarred to board such elevated platform during the course of their shifting / transportation.

F. Contractor shall ensure installation of Safe Load Indicator (SLI) on all cranes (while in use) to minimize overloading risk. SLI shall have capability to continuously monitor and display the load on the hook, and automatically compare it with the rated crane capacity at the operating condition of the crane. The system shall also provide visual and audible warnings at set capacity levels to alert the operator in case of violations.

G. The contractor shall be responsible for safe operations of different equipments mobilized and used by him at the workplace like transport vehicles, engines, cranes, mobile ladders, scaffoldings, work tools, etc.

H. The Contractor shall arrange periodical training for the operators of hydra, crane, excavator, mobile machinery, etc. at site by utilizing services from renowned manufacturers.

15.13 HSE IMPLEMENTATION, INSPECTION AND MONITORING

A. The Contractor shall be fully responsible for planning, reporting, implementing and monitoring all HSE requirements and compliance of all laws & statutory requirements.

B. The Contractor shall also ensure that the HSE requirements are clearly understood & implemented conscientiously by their site personnel at all levels at site.

C. The Contractor shall ensure physical presence of their field engineers, supervisors, during the continuation of their contract works/site activities including all material transportation activities. Physical absence of experienced field engineers/supervisors of Contractor at critical work spot during the course of work, may invite severe penalization as per the discretion of EIC, including halting /stoppage of work.

D. The Contractor shall regularly review inspection report internally and implement all practical steps / actions for improving the status continuously.

E. The Contractor shall ensure important safety checks right from beginning of works at every work site locations and to this effect format No: HSE-.10 “Daily Safety Check List” shall be prepared by field engineer & duly checked by safety personnel for conformance.

F. The Contractor shall carry out inspection to identify various unsafe conditions of work sites/machinery/equipments as well as unsafe acts on the part of workmen/supervisor/ engineer while carrying out different project related works.

G. Adequate records for all inspections shall be maintained by the Contractor and the same shall be furnished to, whenever sought.

H. The Contractor shall not carry-out work by engaging single worker anywhere without any supervisor anytime during day or night.

I. As a general practice lifting tools/tackles, machinery, accessories etc. shall be inspected, tested and examined by competent people (approved by concerned State authorities-TPI) before being used at site and also at periodical interval (e.g. during replacement, extension, modification, elongation/ reduction of machine/parts, etc.) as per relevant statutes. Hydra, cranes, lifting machinery, mobile equipments / machinery / vehicles, etc. shall be inspected regularly by only competent / experienced personnel at site and requisite records for such inspections shall be maintained by every contractor. Contractor shall also maintain records of maintenance of all other site machinery (e.g. generators, rectifiers, compressors, cutters, etc.) & portable tools/equipments being used at project related works (e.g. drills, abrasive wheels, punches, chisels, spanners, etc.). The Contractor shall not make use of arbitrarily fabricated 'derricks' at project site for lifting / lowering of construction materials.

J. Site facilities /temporary. installations, e.g. batching plant, cement godown, DG-room, temporary electrical panels/distribution boards, shot-blasting booth, fabrication yards, etc. and site welfare facilities, like labour colonies, canteen/pantry, rest-shelters, motor cycle/bicycle-shed, site washing facilities, First-aid centers, urinals/toilets, etc. should be periodically inspected by Contractor (preferably utilizing HR/Admin. personnel to inspect site welfare facilities) and records to be maintained.

15.14 LOTO (HAZARDOUS ENERGY CONTROL) PROCEDURES

Hazardous Energy Control Procedures, known as "Lockout/ Tag Out (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. Locks should be used as per requirement or job.

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 Sub-contractor working on the Nalco 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.

LOTO RESPONSIBILITIES

A. The Engineers in Charge is responsible for implementing and enforcing this procedure and approving lockouts /tag outs that impact the operation of the project.

B. The Engineer in Charges responsible for authorizing Lockout /Tag out Requests.

C. The Lockout / Tag out Coordinator is responsible for maintaining the Lockout / Tag out Log. Each shift should have a designated Lockout / Tag out Coordinator.

D. 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.

E. 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 OF LOTO RELATED TERMS

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 FOR REQUESTING A LOCK OUT / TAG OUT PERMIT

A. 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.

B. 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.

C. 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.

D. 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.

E. Once approved, the Lockout / Tag out Request Permit shall be forwarded to the Lockout / Tag out Coordinator to assign tags and locks.

F. 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.

PLACEMENT OF LOCKS AND TAGS

A. 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.

B. The isolator(s) shall take the device locks, tags, and the Lockout / Tag out 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 / Tag out 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.

C. 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.

D. 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

WORKING UNDER A LOCK OUT / TAG OUT 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 / Tag out 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.

REMOVAL OF LOCKS AND TAGS

- When the lockout / tag out is no longer required, the Safety Representative or Area Supervisor shall obtain the Lockout / Tag out 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 / Tag out Coordinator. Isolation devices may be repositioned at the discretion of the Engineer in Charge according to operational requirements. The Isolator shall complete the Lockout / Tag out Request Permit indicating each lock and tag has been removed and the Safety Representative or Area Supervisor forward to the Lockout / Tag out Coordinator.
- The Lockout / Tag out Coordinator shall discard the tags and maintain the completed Lockout / Tag out 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/Tag out 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.

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

A. 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.

B. 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.

C. 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

A. isolating device. If the energy isolating device will not accept multiple locks or tags, a hasp (a multiple 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

B. 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.

LOTO 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.

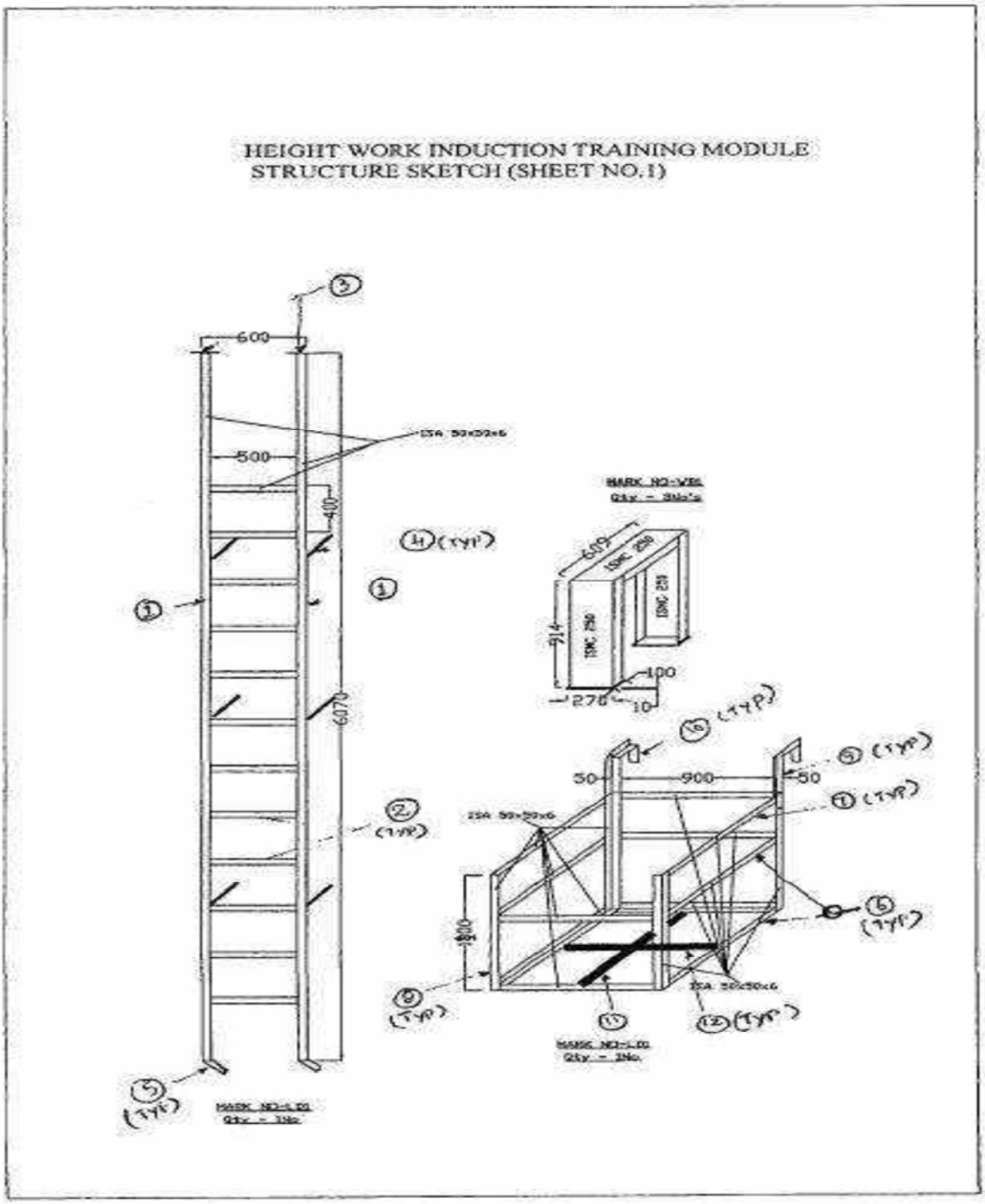
ATTACHMENTS

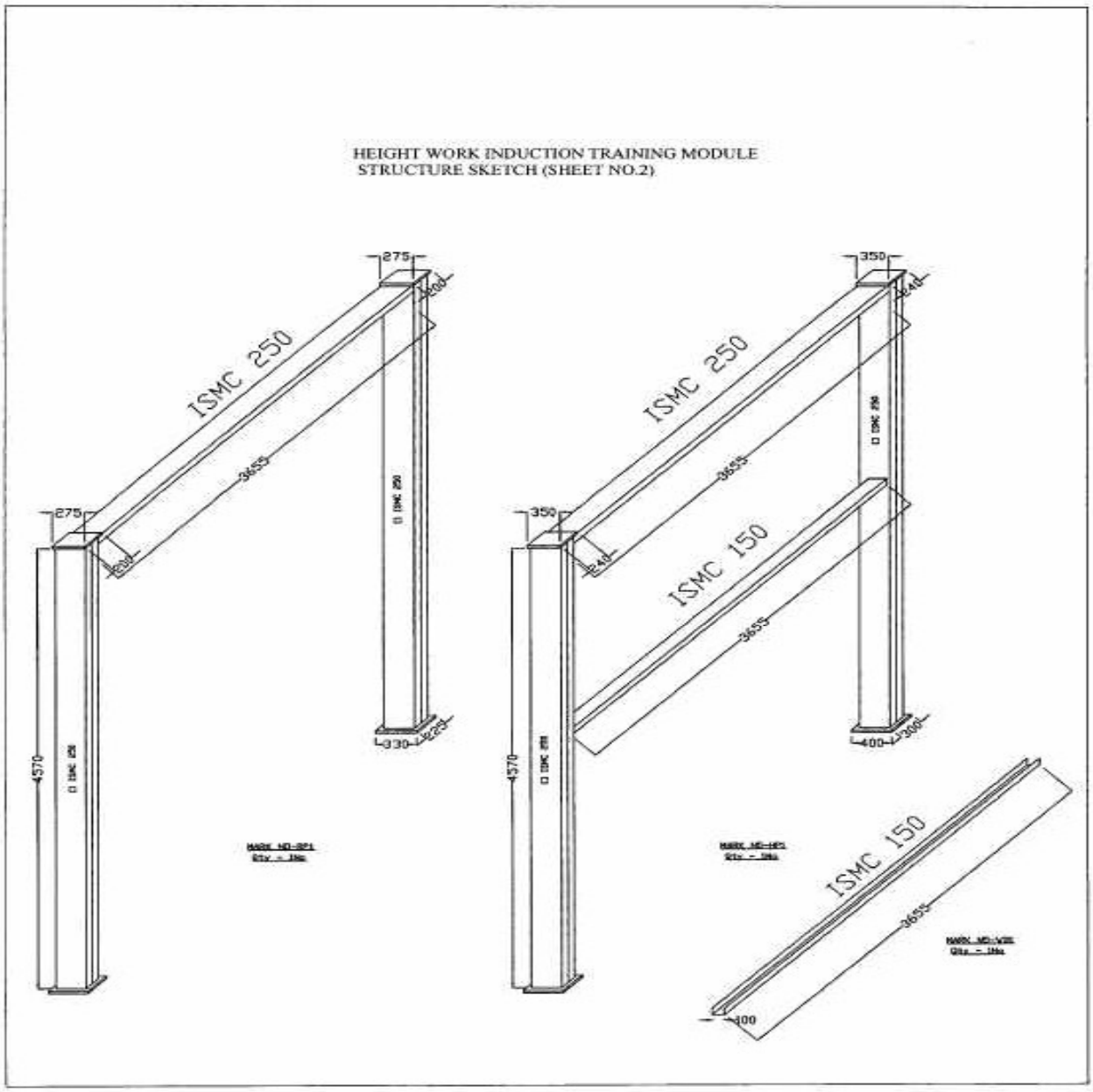
1. Danger (DO NOT OPERATE) Tags
2. Device & Personal Locks and Multi Lock Hasp:


DANGER
DO NOT OPERATE
THIS LOCK/TAG MAY ONLY BE REMOVED BY:
NAME:
DEPT:
EXPECTED COMPLETION:
DANGER
THIS ENERGY SOURCE HAS BEEN LOCKED OUT!
UNAUTHORIZED REMOVAL OF THIS LOCK/TAG MAY RESULT IN POSSIBLE DISCHARGE.
REMARKS


DANGER
LOCKED OUT
DO NOT REMOVE
DANGER
LOCKED OUT
DO NOT REMOVE

15.15 VERTIGO TRANING STRUCTURE FOR HEIGHT WORK




HEIGHT WORK INDUCTION TRAINING MODULE
STRUCTURE SKETCH (SHEET NO.2)
ISMC 250
ISMC 250
ISMC 150
ISMC 150
3655
3655
3655
3655
275
275
350
350
4570
4570
100

BOM FOR HEIGHT WORK INDUCTION TRAINING MODULE

Sl. No.	Description	Width (mm)	Legth (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
						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
						178.271
				Total weight(Kgs)		**2168.525**

Guidelines for conducting the Height work Induction Training:

1. **Walking Bench Training:**
   - Person should walk over the channel. He should maintain balance & walk without much problem.
   - If the person has problem to balance 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:
     a) Usage of vertical fall arrestor.
     b) Usage of two lanyards of a safety harness.
     c) Ensure 3(three) point contact on the ladder while climb.

5. **Chair for work at height Training:**
   - Climb through 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.

Those who pass the above training are fit for height work.

- BHEL may prohibit the use of any construction machinery, which according to the organization is unsafe. No claim for compensation due to such prohibition will be entertained byBHEL.

16.0 NON COMPLIANCE (HSE PENALTY BY BHEL)

Non-conformity of safety rules and safety appliances will be viewed seriously and BHEL has right to impose fines on the sub-contractor as under for every instance of violation noticed:

SL.NO	Violation of Safety Norms	Fine (in Rs)
01	Not Wearing Safety Helmet	200/- *
02.	Not wearing Safety Belt or not anchoring life line	500/-*
03	Not wearing safety shoe	200/-*
04	Not keeping gas cylinders vertically	200/-
05	Not using flash back arrestors	100/-
06	Not wearing gloves	50/- *
07.	Grinding Without Goggles	50/- *
08.	Not using 24 V Supply For Internal Work	500/-
09.	Electrical Plugs Not used for hand Machine	100/-
10.	Not Slinging properly	200/-
11.	Using Damaged Sling	200/-
12.	Lifting Cylinders Without Cage	500/-
13.	Not Using Proper Welding Cable With Lot of Joints And Not Insulated Property.	200/-
14.	Not Removing Small Scrap From Platforms	500/-
15.	Gas Cutting Without Taking Proper Precaution or Not Using Sheet Below Gas Cutting	500/-
16.	Not Maintaining Electric Winches Which are Operated Dangerously	500/-
17.	Improper Earthing Of Electrical T&P	500/-
18	No or improper barricading	500/-
19.	Activity carried out without Safety work permit (Height work, Lifting activity, Hot work-each person/case)	1000/-
20.	Incident Resulting in Partial Loss in Earning Capacity	25,000/- per victim
21.	Fatal Incident Resulting in total loss in Earning Capacity	1,00,000/- per victim for first instance #

- **Legend:-**

  *: per head. For repeated violation by the same person, the penalty would be double of the previous penalty. Date of "Repeated violation" will be counted from subsequent days.

  #: or as deducted by customer, whichever is higher. For repeated fatal incident in the same Unit incremental penalty to be imposed. The Sub-contractor will pay 2 times the penalty compared to previously paid in case there are repeated cases of fatal incidents under the same Sub-contractor for the same package in the same unit.

- Any other non-conformity noticed not listed above will also be fined as deemed fit by BHEL. The decision of BHEL engineer is final on the above. The amount will be deducted from running bills (RA) of the sub contractor.

- The amount collected above will be utilized for giving award to the employees who could avoid incident by following safety rules. Also the amount will be spent for purchasing the safety appliances and supporting the safety activity at site.

17.0 HSE AUDIT/ INSPECTION

- Regular HSE Audit shall be carried out by Sub contractor as per Site audit calender.
- HSE checklist **(Annexure 02)** shall be used for carrying out audit/inspection and report shall be submitted to BHEL site management
- All non-conformities and observations on HSE identified during internal or external HSE audit shall be disposed off by site in a time bound manner and reported back the implementation status
- Corrective action and Preventive action on HSE issues raised by certification body issued by Regional HQs shall be implemented by site and reported to Site management.
- Regular HSE inspection shall be carried out by Sub contractor on daily basis.

18.0 MONTHLY/ WEEKLY / HSE COMMITEE REVIEW MEETING

- Site shall hold HSE review meeting every week/ month 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 and Preventive action. The agenda is given below:
- Implementation of earlier MOM
- HSE performance
- HSE inspection
- HSE audit and CAPA
- HSE training
- Health check-up camp
- HSE planning for the erection and commissioning and installation activities in the coming month
- HSE reward and promotional activities
- The meeting shall be chaired by Construction Manager, convened by HSE coordinator and attended by all HOS, Site In-charge of Sub-contractors and HSE officer of Sub-contractors.
- MOM on the discussion will be circulated to the concerned for implementation.

- The Contractor shall ensure participation of his top most executive at site (viz. Resident Construction Manager/Resident Engineer/ Project Manager / Site-in-Charge) in Safety Committee / HSE Committee meetings arranged by BHEL/Owner usually on monthly basis or as and when called for. In case Contractor's top most executive at site is not in a position to attend such meeting, he shall inform BHEL/Owner in writing before the commencement of such meeting indicating reasons of his absence and nominate his representative failure to do so may invite very stringent penalization against the specific Contractor, as deemed fit in Contract. The obligation of compliance of any observations during the meeting shall be always time bound. The Contractor shall always assist BHEL/Owner to achieve the targets set by them on HSE management during the project implementation.

- In addition, the Contractor shall also arrange internal HSE meetings chaired by his top most executive at site on weekly basis and maintain records. Such internal HSE meetings shall essentially he attended by field engineers/ supervisors (& not by safety personnel only) of the Contractor and its associates.
- Records of such internal HSE meetings shall be maintained by the Contractor for review by BHEL/Owner or for any HSE Audits.

AGENDA OF INTERNAL HSE MEETING SHOULD BROADLY COVER:

A. Confirmation of record notes / minutes of previous meeting
B. Discussion on outstanding subjects of previous points /subjects, if any
C. Incidents / Accidents (of all types) at project site, if any
D. Current topics related to site activities/subjects of discussion
E. House keeping
F. Behavioral Safety
G. Information / views / deliberations of members / site sub Contractors

H. Report from Owner /Client
I. Status of Safety awareness, Induction programs & Training programs
J. The time frame for such HSE meeting shall be religiously maintained by one and all.

19.0 FORMATS USED (DETAILS AVAILABLE IN ANNEXURE - 04)

SL. No.	Format Name	Format No.	Rev No.
01	Inspection of First Aid Box	HSEP:14-F01	00
02	Health Check Up	HSEP:14-F02	00
03	HSE Induction Training	HSEP:14-F03	00
04	Tool Box Talk	HSEP:14-F04	00
05	Monthly Site HSE Report	As specified by BHEL	00
06	Inspection of PPE	HSEP:14-F06	00

07	Inspection of T&Ps	HSEP:14-F07	00
08	Status of T&Ps	HSEP:14-F08	00
09	Inspection of Cranes and Winches	HSEP:14-F09	00
10	Inspection on Height Working	HSEP:14-F10	00
11	Inspection on Welding & Gas Cutting	HSEP:14-F11	00
12	Inspection on Electrical Installation	HSEP:14-F12	00
13	Inspection on Elevator	HSEP:14-F13	00
14	HSE Penalty	HSEP:14-F14	00
15	Accident /incident / property damage /fire incident report	HSEP:14-F15	00

20.0 ANNEXURES

ANNEXURE 01

As per Contract Labour (Regulation & Abolition Act), Central Rules, 1971,

(1) The first-aid box shall be distinctively marked with a Red Cross on a white background and shall contain the following items, namely:

(a) For establishments in which the number of contract labour 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 Labour 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 labour 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 labour 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 02

HSE AUDIT/ INSPECTION CHECKLIST CUM COMPLIANCE REPORT

PROJECT:_____ SUBCONTRACTOR:

DATE: _____ OWNER :

_____INSPECTIONBY:

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				
PERSONNELPROTECTIVEEQUIPTMENTS				
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				
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				
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 rags and 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.				

ANNEXURE 03

REFERENCES

- Contract documents
- Relevant legislations
- HSE MSM
- Relevant Indian standards as listed below (illustrative only):

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:3786 – 1983 (Reaffirmed 2002)	Method for Computation of Frequency and Severity Rates for Industrial Injuries and Classification of Industrial Incidents
(10)	IS:4770 : 1991 (Reaffirmed 2006)	Rubber Gloves – Electricals purposes-Specification
(11)	IS:4912 : 1978 (Reaffirmed 2002)	Safety Requirements for Floor and Wall Openings, Railings and Toe Boards
(12)	IS: 5983 – 1980 (Reaffirmed 2002)	Specification for Eye-Protectors
(13)	IS:6519 – 1971 (Reaffirmed 1997)	Code of Practice for Selection, Care and Repair of Safety Footwear
(14)	IS:9167:1979	Specification for Ear-Protectors
(15)	IS:6994(Part I)-1973 (Re affirmed 1996)	Specification for Industrial Safety Gloves Leather and Cotton Gloves
(16)	IS:8519 – 1977 (Reaffirmed 1983)	Guide for Selection of Industrial Safety Equipment for Body Protection.
(17)	IS 11006 : 2011	Flash Back(Flame Arrestor) Specification

(18)	IS:8520 – 1977 (Reaffirmed 2002)	Guide for Selection of Industrial Safety Equipment for Eye, Face and Ear Protection.
(19)	IS:9473:2002	Respiratory Protective Devices-Filtering Half Masks to protect against Particles-Specification.
(20)	IS:9944:1992 (Reaffirmed 2003)	Natural and Man-made Fiber Rope Slings-Recommendations on Safe working loads.
(21)	IS:11057 – 1884 (Reaffirmed 2001)	Specification for Industrial Safety Nets
(22)	IS:12254:1993 (Reaffirmed 2002)	Polyvinyl Chloride (PVC) Industrial Boots-Specification
(23)	IS:13367(Part 1):1992 (Reaffirmed 20030	Safe Use of Cranes-Code of Practice
(24)	IS:14166:1994 (Reaffirmed 2002)	Respiratory Protective Devices-Full Face Masks Specification
(25)	IS:14746 : 1999 (Reaffirmed 2003)	Respiratory Protective Devices-Half Masks and Quarter Masks - Specification
(26)	IS : 15397 :2003 (Reaffirmed 2008)	Portable Extinguisher Mechanical Foam Type(Stored Pressure)-Specification
(27)	IS: 19011:2002	Guidelines for Quality and/or Environmental Management Systems Auditing

ANNEXURE 04: SAFETY FORMATS

&

ANNEXURE 05: WORK PERMIT FORMATS

	POWER SECTOR	FORMAT NO: HSEP:14-F01 REV NO.: 00 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 on 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.		

Sl. No.	Item	No. Available	Remarks
17	Whether 120 ml bottle containing Sal volatile having the dose and mode of administration indicated on the label, available.		
18	Whether roll of adhesive plaster (6 cmX1 meter)available		
19	No of rolls of adhesive plaster (2 cmX1 meter)		
20	Whether snake bite lancet available.		
21	Whether (30 grams) bottle of potassium permanganate crystals available.		
22	Whether a pair scissors available		
23	Whether copy of the First-Aid leaflet issued by the Director-General, Factory Advice service and labour 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		

Signature of Sub contractor's Site I/C:

	POWER SECTOR	FORMAT NO: HSEP:14-F02 REV NO.: 00
	HEALTH CHECK UP	

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

NAME:

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	:		
Ear, Nose, Throat	:		
Ear	:		
Nose	:		
Throat	:		

	POWER SECTOR	FORMAT NO: HSEP:14-F02
	HEALTH CHECK UP	REV NO.: 00

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

	POWER SECTOR	FORMAT NO: HSEP:14-F03
	HSE INDUCTION TRAINING	REV NO.: 00 PAGE NO. 01 OF 01

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

Sl No.	Name	Designation	Organization	Signature

Signature of Training coordinator :

	POWER SECTOR	FORMAT NO: HSEP:14-F04 REV NO.: 00 PAGE NO. 01 OF 01
	TOOL-BOX 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 Sub-contractor :

	POWER SECTOR	FORMAT NO: HSEP:14-F06 REV NO.: 00 PAGE NO. 01 OF 01
	PERSONAL PROTECTIVE EQUIPMENTS	

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 Sub-contractor :

	POWER SECTOR	FORMAT NO: HSEP:14-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-Site Safety Officer (BHEL)	**Signature-Subcontractor/ Subcontractor's Safety Officer**

	POWER SECTOR	FORMAT NO: HSEP:14-F08 REV NO.: 00 PAGE NO. 01 OF 01
	STATUS OF T&Ps	

Name of Site	
Name of Sub-Contractor	
Date of Inspection	

Item	**Nos. Deployed**	**Identification No.**	**Nos. Tested by competent person**	**Validity of Test Certificate**
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:

	POWER SECTOR **INSPECTION OF CRANES AND WINCHES**	FORMAT NO: HSEP:14-F09 REV NO.: 00

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, Overload and SLI of crane/Hydra		
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		

Sl.no.	Description	Observation	Measures
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		

WINCH

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?				

Sl. No.	Description	YES	NO	NA	Remarks
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 Number of NO:				
	Total Number of NA:				
	% Compliance :				

Signature of Site I/C of Sub-contractor :

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	Area below the work place barricaded, particularly below hot work.		
6	Workers provided with bags /box to carry bolts, nuts and hand tools		
7	Arrangement for fastening hand tools made.		
8	All work platforms ensured to be of adequate strength and ergonomically suitable.		
9	Fabricated makeshift arrangements are checked for quality and type of material welding, anchoring etc.		
10.	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?		
7	Are built up ladders constructed of sound materials?		

Sl. No.	Descriptions	Observation (Yes/ No)	Remarks
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 Sub-contractor :

	POWER SECTOR **INSPECTION OF WELDING AND GAS CUTTING**	FORMAT NO: HSEP:14-F11 REV NO.: 00

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/c lugged & 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 **INSPECTION OF WELDING AND GAS CUTTING**	FORMAT NO: HSEP:14-F11 REV NO.: 00

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 Sub-contractor :

	POWER SECTOR	FORMAT NO: HSEP:14-F12 REV NO.: 00 PAGE NO. 01 OF 02
	INSPECTION OF ELECTRICAL INSTALLATION	

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?		

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 Sub-contractor :

	POWER SECTOR	FORMAT NO: HSEP:14-F13 REV NO.: 00 PAGE NO. 01 OF 01
	INSPECTION OF ELEVATOR	

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 Inspection of Excavation	FORMAT NO: HSEP:14-F13E REV NO.: 00 PAGE NO. 01 OF 01

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

Sl.no.	Description	Yes	No	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	Slope Cutting / Angle Maintained			
8	Hard Barricading & Edge Protection provided			
9	Separate Safe Access for Man and Vehicle			
10	Lighting arrangement			
11	Banksman Provided			
12	Required basic PPEs provided			
13	Excavated soil / Construction Material / equipment kept away from the edge.			
14	First aid in attendance.			
15	Other:			
	Total No of YES			

Signature-Subcontractor/ Subcontractor's Safety Officer **Signature-Site Safety Officer (BHEL)**

Sub: MEMO for Penalty for non-compliances in Safety

Following lapse (tick marked) was observed and penalty is imposed as stated at the bottom of this memo. It is requested that such occurrences be please avoided in future.

Safety Area

SN	Violation of Safety Norms	Fine (in Rs)
01	Not Wearing Safety Helmet	200/- *
02.	Not wearing Safety Belt or not anchoring life line	500/-*
03	Not wearing safety shoe	200/-*
04	Not keeping gas cylinders vertically	200/-
05	Not using flash back arrestors	100/-
06	Not wearing gloves	50/- *
07.	Grinding Without Goggles	50/- *
08.	Not using 24 V Supply For Internal Work	500/-
09.	Electrical Plugs Not used for hand Machine	100/-
10.	Not Slinging properly	200/-
11.	Using Damaged Sling	200/-
12.	Lifting Cylinders Without Cage	500/-
13.	Not Using Proper Welding Cable With Lot of Joints And Not Insulated Property.	200/-
14.	Not Removing Small Scrap From Platforms	500/-
15.	Gas Cutting Without Taking Proper Precaution or Not Using Sheet Below Gas Cutting	500/-
16.	Not Maintaining Electric Winches Which are Operated Dangerously	500/-
17.	Improper Earthing Of Electrical T&P	500/-
18	No or improper barricading	500/-
19.	Activity carried out without Safety work permit (Height work, Lifting activity, Hot work-each person/case)	1000/-
20.	Incident Resulting in Partial Loss in Earning Capacity	25,000/- per victim
21.	Fatal Incident Resulting in total loss in Earning Capacity	1,00,000/- per victim for first instance #

Legend: -

*: per head. For repeated violation by the same person, the penalty would be double of the previous penalty. Date of "Repeated violation" will be counted from subsequent days.

#: or as deducted by customer, whichever is higher. For repeated fatal incident in the same Unit incremental penalty tobe imposed. The Sub-contractor will pay 2 times the penalty compared to previously paid in case there are repeated cases of fatal incidents under the same Sub-contractor for the same package in the same unit.

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/labour

3. Total Penalty= 1. X 2.=

Signature:

Witnessed by: (Sub- Contractor representative) (BHEL Personnel)

Name_____

Distribution: 1 Copy: to Sub- contractor,
1 Copy to Site Construction Manager (BHEL)

बी एच ई एल BHEL	**POWER SECTOR- HQ** **Incident Report** (To be submitted within 24 hours of time of incident)	FORMAT NO: HSEP:14-F15 REV NO.:00 PAGE NO. 01 OF 01

Type of incident: Fatal/Major/ Minor/Fire/Property Damage/Near-miss

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 BODYINJURED					
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				

ANALYSIS		
14	WHAT ACTS AND / OR CONDITIONS CONTRIBUTED MOST DIRECTLY TO 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 ACCIDENT RECURRENCE ?	
	DATE :	SIGNATURE OF SITE HSE COORDINATOR
17	COMMENTS OF HEAD / SOX	
	DATE:	SIGNATURE OF HEAD/SOX

Note: This is a template and can be modified in consultation with BHEL			
Name of the Site		**Name of the Subcontractor**	
Scope of Work		**Date**	
PART- A: PLAN OF HSE ACTIVITIES FOR THE MONTH OF……			**PART-B: REVIEW ON ……**
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	Areas 1. … …	
2	Health check-up as per Format: F02	Health check-up for Nos 1. New inductees 2. Drivers & Operators 3. Workers in following high risk areas: a. …	
3	Induction training of newly joined workers as per Format: F03	Minimum No. of workers:	
4	Toolbox talks (TBT) conducted before start of work as per Format: F04	Locations of TBTs & No. of workers **1.** …	
5	PPE usage and issue as per Format: F06		
6	Inspection of T&Ps as per Format: F07	List of T&Ps to be inspected 1.	
7	Identification & Inspection Status of T&Ps as per Format: F08		
8	Inspection of Cranes & Winches as per Format: F09	List of Cranes & Winches & Nos. 1. …	
9	Inspection of Height Working as per Format: F10	Areas: 1. …	
10	Inspection of Welding & Gas Cutting operations as per Format: F11	Areas: 1. …	
11	Inspection of Electrical Installations as per Format: F12	Locations: 1. …	
12	Inspection of Elevators (as applicable) as per Format: F13	Locations: 1. …	
13	Inspection of Excavation as per Format: F13E	**Locations:** **1. …**	

SN.	Description of HSE Activity& Formats	Plan & Targets for the month	Review
14	Job Safety Analysis as per Format F32B	**Activities:** **1. …**	
15	Regular Job Specific Training (Re-training) for workers involved in hazardous activities	Topics/ Hazards & No. of workers **1.** …	
16	Mass housekeeping (HK) drive in work areas	Areas **1.** …	
17	Vertigo Test of Height workers	Minimum No. of workers:	
18	Deployment of qualified HSE Officers as per contract	Location(s) & Nos. **1.** …	
19	Deployment of qualified HSE Stewards as per contract	Location(s) & Nos. **1.** …	
20	Deployment of Safety tools & Equipment (Safety Nets, Lifelines, Fall arrestors, Man-cages, flashback arrestors, scaffolding etc.)	Tool/ Equipment & Location **1.** …	
21	Safety Walks by site in charge of agency (4 -Weekly once)	Dates:	
22	Safety walks by departmental head (8-Weekly twice)	Dates:	
23	Availability/ deployment of Safety posters/ placards/ signage at strategic locations	Locations: Nos. **1.** …	
24	Provision of clean drinking water sources for workers	Locations: Nos. **1.** …	
25	Provision of toilets for workers (separate for male & female workers)	Locations: Nos. **1.** …	
26	Rest sheds for workers during lunchtime, rain, dust storm etc.	Locations: Nos. **1.** …	
27	Availability of following in Labor colony	**1. Clean drinking water** **2. Toilets** **3. Cleanliness & Hygiene** **4. Grass cutting,** **5. Fogging** **6. Electrical Inspection …**	

SN.	Description of HSE Activity& Formats	Plan & Targets for the month	Review
28	Availability of dust/ waste bins at various locations	Locations: **1.** …	
29	Availability of Ambulance (individual/ joint) in each shift	Ambulance No.	
30	Availability of emergency vehicle in each shift	Emergency vehicle	
31	Deployment/ Availability of tested Fire Extinguishers	Locations & Nos. **1.** …	
32	Tree plantation	Locations & Nos. **1.** …	
33	Waste disposal & Scrap Bins	Locations **1.** …	
34	Illumination checks	Locations **1.** …	
35	Safety award function: 1. Display of good practices Award presentation	Minimum 1 per month	
36	**Submission of Daily Reports as per Format No.F31A**	**Daily Reports (Night & Day Shifts)**	

PLAN		**REVIEW**	
Agency Name: Sign: Date:	**BHEL** Name: Sign: Date:	**Agency** Name: Sign: Date:	**BHEL** Name: Sign: Date:

	POWER SECTOR **Format for Daily HSE Reporting**	FORMAT NO: **HSEP:14-F31**A REV NO.: 00 PAGE NO. 01 OF 1

Note: Following format to be submitted (preferably) in excel/ soft copy by Sub-contractor daily at the end of each shift. Any photographs/ records to attached

Site									**Subcontractor**																			
Year									**Month**																			
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	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		Any other Remarks/ Inputs
Day																												
Night															NA		NA	NA	NA									

	POWER SECTOR Job Safety Analysis Format	FORMAT NO: **HSEP:14-F32B** REV NO.: 00 PAGE NO. 01 OF 1

Name of the Site	
Name of the Subcontractor	
Activity, Area	

HAZARDS	PRECAUTIONS

(Name)	Submitted By (Agency HSE)		Reviewed By (BHEL Execution)		Approved By (BHEL HSE)	
(Sign)						
(Date)						

SL	Parameter for Measurement	M/ O	Wt	Supporting Documents
1a	Induction training for new workers conducted through audio-visual medium & documented ?	M	1	Induction Training Records
1b	Tool box talk conducted regularly as per plan, and documented?	M	1	Toolbox Talk Records
1c	Contractor in charge and safety in charge attended safety meetings?	M	2	Minutes of Meeting
1d	Whether observations in safety meetings are complied before next meeting?	M	2	-do-
1e	Preparation and submission of Monthly HSE report within stipulated time	M	1	Report submission date
1f	Preparation and submission of Incident/near-miss report and RCA Report (as applicable) within stipulated time	M	1	Incident/ Near Miss Records
1g	Carrying out Inspections and submission of Inspection reports within stipulated time	M	1	Inspection Records
1h	Regular Job Specific Training ensured for High Risk Workers (through audio-visual medium) as per plan	M	1	Training & Attendance Records
2a	Whether the contractor is registered under BOCW	M	2	BOCW Registration Certificate
2b	Availability of Qualified safety officer (1 for every 500 labour)	M	2	Safety Officer qualification & experience records
2c	Availability of Qualified safety supervisor (1 for every 100 labour)	M	2	Safety Officer qualification & experience records
2d	All the workers are provided and using safety helmets and safety shoes/gum boots	M	2	PPE Issue Records, Inspection/ non-conformity records
2e	Housekeeping done on regular basis and scrap removal at site	M	1	Housekeeping records, Inspection/ non-conformity records
2f	Usage of Goggles/Face shields and Hand gloves for gas cutter and grinders		1	PPE Issue Records, Inspection/ non-conformity records
2g	Wall openings & floor openings are guarded?		1	Inspection/ non-conformity records
2h	Adequate illumination provided in all working area?		1	Inspection/ non-conformity records
2i	Safety posters, sign boards and emergency contact numbers in all prominent location are displayed?		1	Inspection/ non-conformity records
2j	Availability of automatic reverse horns, Main horn, hook latches for Vehicles, mobile cranes, Hydras		1	Inspection/ non-conformity records
2k	Ban of carrying mobile phones to work place is implemented for workers		1	Inspection/ non-conformity records
2l	Availability of Tags & Inspection Certificates for Cranes of all capacities		1	Master T&P List with internal & external test details
2l.2	Availability of Tags & Inspection Certificates for Winches of all capacities		1	Master T&P List with internal & external test details
2l.3	Availability of Tags & Inspection Certificates, color coding for Chain pulley blocks		1	Master T&P List with internal & external test details
2l.4	Availability of Tags & Inspection Certificates for Vehicles - Trailers, Dozers, Dumpers, Excavators. Mixers etc.		1	Master T&P List with internal & external test details
2l.5	Availability of Tags & Inspection Certificates for Welding machines, grinders, Drilling machines, etc.		1	Master T&P List with internal & external test details
2l.6	Availability of Tags & Inspection Certificates, colour coding for Wire rope slings etc.		1	Master T&P List with internal & external test details
2l.7	Availability of Tags & Inspection Certificates for Batching plants		1	Master T&P List with internal & external test details

SL	Parameter for Measurement	M/ O	Wt	Supporting Documents
7a	Whether Scaffolding pipes made with steel or aluminum, are being used and checked periodically by experienced/ certified scaffolder?		2	Inspection/ non-conformity records
7b	8mm Stainless Steel wire rope with plastic cladding is provided for life line (Vertical / Horizontal) during height work?		2	-do-
7c	Availability of emergency lighting in case of power failure		1	-do-
7d	Whether all the openings are covered with Safety Nets made of fire proof Nylon?		1	-do-
7e	Whether MS pipe rails around staircases & platforms in usage are provided with top, middle rails and toe guard ?		1	-do-
7f	Whether Ladder with vertical life line /Fall arrestor is available to climb?		1	-do-
7g	Whether all workers deployed for working at height have been issued height pass after undergoing vertigo test?		1	Height Pass records
7h	Whether all workers deployed for height work / climbing ladder are provided and using Double lanyard safety belt?		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?		1	-do-
8a	Flash back arrestors for all gas cutting sets is available on Torch side and cylinder side		1	Inspection/ non-conformity records
8b	Oxygen/Acetylene/LPG cylinders not in use have caps in place and stored separately?		1	-do-
8c	Availability of Face screen, Hand gloves, and Apron, for welders		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		1	-do-
9a	Pre-employment medical check-up done for all workers and submitted?		1	Medical check records
9b	Availability of first aid center, with MBBS doctor(Own or Sharing basis)	**M**	2	Attendance records
9c	Availability of Ambulance facility 24 hours (Own or sharing basis)	**M**	2	-do-
9d	Is First aid trained personnel's are available and their names are displayed at site?	**M**	1	-do-
9e	Availability of Emergency vehicle at site		1	
9f	Periodical medical check-up is conducted for all the workers and submitted?		1	Medical check records
9g	Availability of sufficient number of first aid box as per standard list and maintaining record		1	Inspection records
10a	Availability of Fire extinguishers, buckets at all vulnerable points		2	Fire extinguisher records
10b	Periodic fire mock drill conducted?		1	Fire, Mock drill records
10c	Are all flammable materials are stored separately?		1	
10d	Periodic grass cutting is done in material storage area?		1	
10e	Availability of 24V DC lighting in confined space work area		1	
10f	Availability of exhaust fan in confined space work area		1	

Note:

- **M: Mandatory; O: Optional**. Points other than mandatory can be excluded with appropriate justification (scope etc.) by BHEL
- Additionally: 30 Marks for each Fatal Accident and 10 mark for each major accident shall be deducted.

BURNING/ WELDING / HOT WORK PERMIT

Area:_____Date:_____Time:_____

Name of Site Engineer (Permit Requesting Authority):_____Sign:_____

Name of Work Performing Contractor:_____

Name of Package In-charge:_____Sign:_____Date:_____

Description of Work:

_____

Work Execution Date:_____Time Valid from:_____to

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
1.	Proper Access/Exit available		
2.	Proper ventilation and /or lighting provided.		
3.	Proper and safe scaffolding, platform, ladder provided.		
4.	Welding machine located in a clean and dry area.		
5.	Welding machine grounded at the equipment and proper leakage current protection device (ELCB) provided for welding machine.		
6.	Emergency STOP buttons are in working condition. Welder /Helper knows how to operate it.		
7.	Welding machine input/output cables, welding holder and weld return clamp (Holder) are insulated and in good condition.		
8.	Welder & Fitter trained to connect ground/work return clamps (Holder) to work place prior to energization of welding machine.		
9.	Gas cylinders are stacked vertically and not below the welding / cutting area. Regulator key is available with cylinder.		
10.	Pressure gauges/Flash back arrestor provided and in working condition.		
11.	Personal Protective equipment Minimum applicable: safety helmet, safety goggles, welding helmet, safety shoes, leather gloves, long sleeve and nose mask -provided		
12.	In case of pits, water removed from the pit and wood/rubber insulation provided.		
13.	Safety signboards are in place.		
14.	Adequate and Suitable nos. of fire fighting extinguisher provided.		
15.	Nearby combustible material removed. Housekeeping done.		
16.	Other		

Name of 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:

I hereby declare that the work is 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 Site Engr. (Permit Requesting Authority):_____Sign:_____Date:_____Time:_____

Name of BHEL Site Engr. (Permit Issuing Authority):_____Sign:_____Date:_____Time:

(This permit is valid only for the date it is issued)

Original at BHEL site **Second Copy –BHEL SAFETY** **Third Copy :Contractor**

LIFTING ACTIVITY PERMIT

Area :_____ Date:_____ Time:_____

Name of Site Engineer (Permit Requesting Authority):_____ Sign: Name of Work Performing Contractor: _____

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

Description of Work:

_____

Work Execution Date:_____ Time Valid from:_____ to

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
1.	Crane used for lifting activity tested, certified and approved for rated lifting		
2.	All lifting tackles, gears/appliances are tested and certified for lifting works.		
3.	Crane operator is trained and competent for lifting operation.		
4.	Lifting sling/ belt is protected against sharp edge of the jobs to be lifted.		
5.	Access and exit marked and without obstruction.		
6.	Lifting arrangement adequate.		
7.	Unwanted rubbish material removed from work platform.		
8.	Minimum 2 guidelines have been provided for balancing and guiding jobs to be lifted.		
9.	Periphery area of crane booms as well as lifting job is barricaded and unauthorized/no-entry sign board posted.		
10.	Rigger and signal man is trained and competent for lifting work.		
11.	No lifting activity to be carried out during lightening, heavy wind/rain.		
12.	If scaffolding to be used during lift, scaffolding with valid tag available for use.		
13.	Double lanyards safety harness/belt checked an in working condition.		
14.	Safety shoes (non-slip), helmet with chin strap available with employees.		
15.	Others.		

Name of 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:

I hereby declare that the work is 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 Site Engr. (Permit Requesting Authority):_____ Sign:_____ Date:_____ Time:_____

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

(This permit is valid only for the date it is issued)

Original at BHEL site **Second Copy –BHEL SAFETY** **Third Copy :Contractor**

WORKING AT HEIGHT PERMIT

Area :_____Date:_____Time:_____

Name of Site Engineer (Permit Requesting Authority):_____Sign: Name of Work Performing Contractor: _____

Name of Package In charge:_____Sign:_____Date:_____

Description of Work:

_____

Work Execution Date:_____Time Valid from:_____to

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
1.	All workers on job are medically fit for working at height (Person should not have vertigo)		
2.	Scaffolding with valid tag available for use		
3.	Safety harness with life line support/ fall arrester are checked and in working condition		
4.	Safety shoes (non-slip), Helmet with chin strip available with employees		
5.	Safety nets are provided as per design and provided 25 ft. below working area & extending 8 ft beyond.		
6.	Horizontal life lines are provided to cater to design specification of 2300kg per person.		
7.	Ladders have been inspected and provided as per BHEL standard/contract.		
8.	All lifting / tightening tools, hand tools/equipment checked and in good condition		
9.	Access and exit marked and without obstruction.		
10.	Lighting arrangement adequate.		
11.	Unwanted and rubbish material removed from working platform.		
12.	Electrical cable, welding Hose/Compressed air hose properly secured and lay down without obstruction.		
13.	Signboards provided on working platforms		
14.	Hazards in the vicinity are identified and communicated to the worker.		
15.	Other		

Name of 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:

I hereby declare that the work is 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 Site Engr. (Permit Requesting Authority):_____Sign:_____Date:_____Time:_____

Name of BHEL Site Engr. (Permit Issuing Authority):_____Sign:_____Date:_____Time:

(This permit is valid only for the date it is issue

Original at BHEL site **Second Copy – BHEL SAFETY** **Third Copy : Contractor**

CONFINED AREA WORK PERMIT

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 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 used?		
13.	Whether Dust/Gas/Air Line mask used?		
14.	Whether attendant with SCBA/Air mask available?		
15.	Whether grounded air Exhaust/Blower/ AC provided?		
16.	Whether Personal Gas alarm provided?		
17.	Whether communication Equipment Provided?		
18.	Whether rescue equipment/team available?		
19.	Whether firefighting arrangement done		
20.	Emergency response team & Medical Facilities available.		
21.	Work hazards are identified, controlled and communicated to the worker.		
22.	Method Statements/ Job Safety Analyses attached:		
23.	Other:		
24.	List of Other Permits Required for the Activity (Attached):		

The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.

A. Permit Requester/ Receiver (Agency):

Site Engineer:	**Site HSE Officer:**
Signature:	Signature:
Name: Designation:	Name: Designation:

B. Permit Issuer (BHEL):

Site HSE Officer / Authorized Representative:	**Site Engineer / Authorized Representative:**
Signature:	Signature:
Name: Designation:	Name: Designation:

C. Package-in-charge (BHEL):

Signature:
Name: Designation:

(* Permit valid for 14 days as per overleaf format)

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 WORK PERMIT

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.

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		TagI Lock Removed by Name/Sign - Date/Time	

No.	Item	Yes	Not required / Remarks
1.	Emergency response team & Medical Facilities available.		
2.	Work hazards are identified, controlled and communicated to the worker.		
3.	Method Statements/ Job Safety Analyses attached:		
4.	Other:		
5.	List of Other Permits Required for the Activity (Attached):		

The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.

D. Permit Requester/ Receiver (Agency):

Site Engineer:
Signature:
Name: Designation:

Site HSE Officer:
Signature:
Name: Designation:

E. Permit Issuer (BHEL):

Site HSE Officer/ Authorized Representative:
Signature:
Name: Designation:

Site Engineer/ Authorized Representative:
Signature:
Name: Designation:

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

(* Permit valid for 14 days as per overleaf format)

(To be printed on both sides of an A4

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

DEMOLISHING/ DISMANTLING WORK PERMIT

Project : Sr. No. :

Name of the work : Date :

Name of contractor : Job No. :

Name of sub-contractor (List enclosed with name & gate pass numbers) : No. of workers to be engaged:

Line No./Equipment No./Structure to be dismantled:

Location details of dismantling/demolition with sketch: (clearly indicate the area)

The following items have been checked & compliance shall be ensured during currency of the permit:

Sl. No.	Item Description	Done	Not Applicable
1.	Services like power, gas supply, water, etc disconnected		
2.	Dismantling/Demolishing method reviewed & approved		
3.	Usage of appropriate PPEs ensured		
4.	Precautions taken for neighbouring structures		
5.	First-Aid arrangements made		
6.	Fire fighting arrangements ensured		
7.	Precautions taken for blasting		

(Contractor's Supervisor) (Contractor's Safety Officer)

Permission is granted.

(Permit issuing authority)

Name :

Date:

Completion report:

Dismantling/Demolishing is completed on …… Date at ……. Hrs.

Materials/debris transported to identified location (as applicable) ☐ Tagging completed ☐

Services like power, gas supply, water, etc restored ☐

(Permit issuing authority)

CONTRACTOR's NAME

SAFETY WALK-THROUGH REPORT

(Name & signature of walk through performer to be inserted at the bottom of each page)

Project : _____ Report no. : _____

Date : _____ Contractor : _____

Inspection by : _____ Owner : _____

Frequency : Monthly Job no. : _____

Note: Write 'NA' wherever the item is not applicable.

Sl. No.	Item	Satis-factory/Yes	Non- satis-factory/No	Remarks	Action
1.	Housing Keeping				
a)	Waste containers provided and used				
b)	Sanitary facilities adequate and clean				
c)	Passageways and walkways clear				
d)	General neatness of working areas				
e)	Other				
2.	Personnel Protective Equipment				
a)	Goggles; Shields				
b)	Face protection				
c)	Hearing protection				
d)	Foot protection				
e)	Hand protection				
f)	Respiratory masks etc.				
g)	Full body harness conforming to CC, EN 361				
h)	Hard hat (HDPE)				
i)	Other				
3.	Excavations/Openings				
a)	Openings properly covered or barricaded				
b)	Excavations shored				
c)	Excavations barricaded				
d)	Overnight lighting provided				
e)	Other				

Safety walk-through performer (Name & Signature).....

(continued)

Sl. No.	Item	Satis-factory/Yes	Non- satis-factory/No	Remarks	Action
4.	Welding & Gas Cutting				
a)	Gas cylinders chained upright				
b)	Cables and hoses not obstructing				
c)	Screens or shields used				
d)	Flammable materials protected				
e)	Live electrode bits contained properly				
f)	Fire extinguisher (s) accessible				
g)	Other				
5.	Scaffolding & Barricading				
a)	Fully decked platforms				
b)	Guard and intermediate rails in place				
c)	Toe boards in place				
d)	Adequate shoring				
e)	Adequate access				
f)	Positive barricading for critical activities				
g)	Installation of warning signs				
h)	Other				
6.	Ladders				
a)	Extension side rails 1 m above				
b)	Top of landing				
c)	Properly secured				
d)	Angle $\pm 70^0$ from horizontal				
e)	Other				
7.	Hoists, Cranes and Derricks				
a)	Condition of cables and sheaves OK				
b)	Condition of slings, chains, hooks and eyes OK				
c)	Inspection and maintenance log-books maintained				
d)	Outriggers used				
e)	Reverse horn installed/ active/coupled with gear				

Safety walk-through performer (Name & Signature) ……

(continued)

Sl. No.	Item	Satisfactory / Yes	Non satisfactory / No	Remarks	Action
f)	Signs/barricades provided				
g)	Signals observed and understood				
h)	Qualified operators				
i)	Other				
8.	**Machinery, Tools and Equipment**				
a)	Proper instruction				
b)	Safety devices				
c)	Proper cords				
d)	Inspection and maintenance				
e)	Other				
9.	**Vehicle and Traffic**				
a)	Rules and regulations observed				
b)	Inspection and maintenance				
c)	Licensed drivers				
d)	Other				
10.	**Temporary Facilities**				
a)	Emergency instructions posted				
b)	Fire extinguishers provided				
c)	Fire-aid equipment available				
d)	Secured against storm damage				
e)	General neatness				
f)	In accordance with electrical requirements				
g)	Other				
11.	**Fire Prevention**				
a)	Personnel trained & instructed to make use of facility				
b)	Fire extinguishers checked periodically & record maintained				
c)	No smoking in Prohibited areas				
d)	Fire Hydrants not obstructed				
e)	Regular fire drill conducted				

(continued)

Sl. No.	Item	Satisfactory / Yes	Non-satis-factory/ No	Remarks	Action
12.	**Electrical**				
a)	Use of 3-core armored cables everywhere				
b)	Usage of 'All insulated' or 'double-insulated' electrical tools				
c)	All electrical connection are routed through ELCB				
d)	Natural Earthing at the source of power (Main DB)				
e)	Continuity and tightness of earth conductor				
f)	Effective covering of junction boxes, panels and other energized wiring places				
g)	Ground fault circuit interrupters provided				
h)	Prevention of tripping hazards maintained				
i)	DCP extinguishers arranged & licensed electrician engaged at site				
13.	**Handling and Storage of Materials**				
a)	Safely stored or stacked				
b)	Passageways clear/free from obstructions				
c)	Fire fighting facility in place				
14.	**Flammable Gases and Liquids**				
a)	Containers clearly identified/protected from fire				
b)	Safe storage & transportation arrangement made				
c)	Fire extinguishers positioned nearby				
d)	Facilities kept away from electric spark, hot spatters & ignition source				

(continued)

Sl. No.	Item	Satisfactory /Yes	Non-satis-factory/ No	Remarks	Action
15.	**Working at Height**				
a)	Approved Erection plan and work permit in place				
b)	Safe access, Safe work platform & Safety nets provided				
c)	Life lines, Fall arrester, Full body harness with double lanyards used				
d)	Health Check record available for workers going up?				
e)	Protective handrails arranged around floor openings				
16.	**Confined Space**				
a)	Work Permit obtained from requisite authority				
b)	Test for toxic gas and sufficient availability of oxygen conducted & status				
c)	Supervisor present at site & at least one person outside the confined space for monitoring deputed				
d)	Availability of safe means of entry, exit and ventilation (register for entry & exit maintained)				
e)	Fire extinguisher and first-aid facility ensured				
f)	Lighting provision made by using 24V Lamp				
g)	Proper usage of PPEs ensured				
17.	**Radiography**				
a)	Proper storage and handling of source as per BARC/AERB guidelines (authorized radiographer available)				
b)	Work permit obtained				
c)	Cordoning of the area done				

(continued)

Sl. No.	Item	Satis-factory/Yes	Non- satis-factory/No	Remarks	Action
d)	Use of appropriate PPE's ensured				
e)	HSE training to workers/supervisors imparted during the fortnight (indicate topic)				
f)	Minimum occupancy of workplace ensured				
18.	**Health Checks**				
a)	All Workers medically examined and found be fit for working at heights (slinging, rigging, painting etc.) in confined space in excavation/trenching in shot blasting				
b)	Availability of First Aid box with contents				
c)	Proper sanitation at site, office and labour camps				
d)	Arrangement of medical facilities				
e)	Measures for dealing with illness at site &labour camps				
f)	Availability of Potable drinking water for workmen & staff				
g)	Provision of crèches for children				
h)	Stand by vehicle / ambulance available for evacuation of injured				
19.	**Environment**				
a)	Chemical and Other Effluents properly disposed				
b)	Cleaning liquid of pipes disposed off properly				
c)	Sea water used for hydro-testing disposed off as per agreed procedure				
d)	Lubricant Waste/Engine oils properly disposed				

(continued)

Sl. No.	Item	Satis-factory/Yes	Non- satis-factory/No	Remarks	Action
e)	Waste from Canteen, offices, sanitation etc disposed properly				
f)	Disposal of surplus earth, stripping materials, Oily rags and combustible materials done properly				
g)	Green belt protection				

ACCIDENT/INCIDENT REPORT

(To be submitted by Contractor after every Incident/Accident within 24 hours to DASTUR/Owner)

Report No. : _____ Date : _____

Project site : _____ Name of work : _____

Contractor's name :_____ Contractor's Job Engineer (Name) : _____

Non-disabling injury (Non-LTA)	Hospitalized but resumed duty before end of 48 hrs	
Disabling injury (other LTA)	Hospitalized & failed to resume duty within next 48 hrs	
Fatal (LTA)	Death/Expiry	
First Aid case (non LTA)	Resume duty after first aid	

Name of the injured: ..... Father's name of victim: .....

Sub-contractor's Name: .....

Gate Pass No.: ..... Age: ..... Yrs.

Victim's medical fitness exam. (Pre-empl.) date: .....

Date & time of Accident/Incident: .....

Name of Witness: (1) ..... (2) ..... (3) .....

Profession of victim:

Bar Bender		Carpenter		Meson	
Fitter		Helper		Gas Cutter	
Grinder		Welder		Electrician	
Driver		Rigger		M/c. Operator	
Engineer		Manager		Others (specify)	

Qualification:

No formal education		Non-Matriculate		Matriculate	
Graduate		Post-graduate		Others (specify)	

(continued)

Job Experience:

NIL		Less than 2 yrs		2-5 yrs	
5-10 yrs		11-15 yrs		15 years and above	

Location where the incident happened: .....

Activity/works that was continuing during incident/accident:

Excavation		Demolition		Concrete carrying	
Concrete pouring		Transportation of materials (manually)		Transportation of materials (mechanically)	
Work on or adjacent to water		Work at height (+2.0mts)		Scaffold preparation	
Scaffold dismantling		Piling works		Welding	
Grinding		Gas cutting		Pipe fit-ups & fabrication	
Structural fabrications		Machine works		Hydro-testing works	
Electrical works		Erection activities		Others (specify)	

What exactly the victim was doing just before the incident/accident ?.....
.....
.....

Nature of Injury:

Bruise or Contusion		Abrasion (superficial wound)		Sprains or strains	
Cut or Laceration		Puncture or Open wound		Burn	
Inhalation of toxic or Poisonous fumes or gases		Absorption		Amputation	
Fracture		Others (specify)			

Parts of body involved in incident/accident:

Head		Face		Eyes	
Throat		Arm (above wrist)		Hand (including wrist)	
Fingers		Truck (Abdomen/ Back/ Chest/ Shoulder)		Throat	
Leg (above ankle)		Foot (incl. ankle)		Toes	
Multiple				Others (specify)	

(continued)

Accident type:

Struck against		Struck by		Fall from elevation	
Fall on same level		Caught in		Caught under	
Caught in between		Rubbed or abraded		Contact with (Electricity)	
Contact with (Temp./Extremes)		Contact with chemicals or oils		Vehicle accident	
Others (specify)					

Medical Aid provided (indicate specific aids/treatment etc): .....
.....
.....
.....

Actions taken to prevent recurrence of similar incident/accident:
.....
.....
.....
.....
.....

Intimation to local authorities (Dist. Collector/Local Police Station/ESI Authority) : Yes/No/NA. If yes, to whom .....
.....
.....

Safety Officer
(Signature and Name)
Stamp of Contractor

Site Head/Resident Construction Manager
(Signature and Name)

To: Owner
RCM/Site-in-Charge DASTUR (3 copies)

Divisional Head (Construction) through RCM

Project Manager, DASTUR, through RCM

SUPPLEMENTARY INCIDENT/ACCIDENT INVESTIGATION REPORT
TICK THE APPROPRIATE ONE AS APPLICABLE (Furnish within 72 hours)

Supplementary to Incident/Accident Report No. ..... (Copy enclosed)

Report No.: _____ Date: _____

Project site: _____ Name of work: _____

Contractor's name :_____ Contractor's Job Engineer (Name): ----------

Non-disabling injury (Non-LTA)	Hospitalized but resumed duty before end of 48 hrs	
Disabling injury (other LTA)	Hospitalized & failed to resume duty within next 48 hrs	
Fatal (LTA)	Death/Expiry	
First Aid case (non LTA)	Resume duty after first aid	

Name of the injured: ..... Father's name of victim: .....

Sub-contractor's Name: .....

Gate Pass No.: ..... Age: ..... Yrs.

Victim's medical fitness exam. (Pre-empl.) date: .....

Date & time of Accident/Incident: .....

Name of Witness: (1) ..... (2) ..... (3) .....

Profession of victim:

Bar Bender		Carpenter		Meson	
Fitter		Helper		Gas Cutter	
Grinder		Welder		Electrician	
Driver		Rigger		M/c. Operator	
Engineer		Manager		Others (specify)	

Qualification:

No formal education		Non-Matriculate		Matriculate	
Graduate		Post-graduate		Others (specify)	

Job Experience:

NIL		Less than 2 yrs		2-5 yrs	
5-10 yrs		11-15 yrs		15 years and above	

Location where the incident happened: .....

(continued)

Activity/Works that was continuing during incident/accident:

Excavation		Demolition		Concrete carrying	
Concreting pouring		Transportation of materials (manually)		Transportation of materials (mechanically)	
Work on or adjacent to water		Work at height (+2.0 mts)		Scaffold preparation	
Scaffold dismantling		Piling works		Welding	
Grinding		Gas cutting		Pipe fit-ups & fabrication	
Structural fabrications		Machine works		Hydro-testing works	
Electrical works		Erection activities		Others (specify)	

What exactly the victim was doing just before the incident/accident ?.....
.....
.....

Particular of tools & tackles being used and condition of the same after incident/accident: .....
.....

Description of incident/accident (how the incident was caused): .....
.....
.....

Nature of Injury:

Bruise or Contusion		Abrasion (superficial wound)		Sprains or strains	
Cut or Laceration		Puncture or Open wound		Burn	
Inhalation of toxic or Poisonous fumes or gases		Absorption		Amputation	
Fracture		Others (specify)			

Parts of body involved in incident/accident:

Head		Face		Eyes	
Throat		Arm (above wrist)		Hand (including wrist)	
Fingers		Truck (Abdomen/Back/ Chest/Shoulder)		Throat	

Leg (above ankle)		Foot (incl. ankle)		Toes	
Multiple				Others (specify)	

(continued)

Accident type:

Struck against		Struck by		Fall from elevation	
Fall on same level		Caught in		Caught under	
Caught in between		Rubbed or abraded		Contact with (Electricity)	
Contact with (Temp./Extremes)		Contact with chemicals or oils		Vehicle accident	
Others (specify)					

Name & Designation of person who provided First-Aid to the victim: .....
.....

Name & Telephone number of Hospital where the victim was treated: .....
.....

Mode of transport used for transporting victim – Ambulance/Private car/Tempo/Truck/Others: .....

How much time taken to shift the injured person to Hospital: .....

In case of FATAL incident, indicate clearly the BOCW Registration No. of the Victim/Company: .....

Comments of Medical Practitioner, who treated/attended the victim/injured (attached/described here): .....

What actions are taken for investigation of the incident, please indicate clearly – (Video film/Photography/Measurements taken etc: .....
.....)

Immediate cause (Please tick the right applicable)**:**

Hazardous methods or procedures inadequately guarded		Poor housekeeping		Inadequate or improper PPE	
Environmental hazards (excess noise/space constraint/inadequate ventilation)		Improper illumination/moving on oval surface		Working on dangerous equipment	
Failure to secure		Horse-play		Failure to use PPE	
Inattention to surroundings		Improper use of hands & body parts		By-passing safety devices	

Unsafe mixing or placement of tools & tackles		By-passing standard procedures		Failure in communication	
Operating without authority		Improper use of equipment or tools & tackles		Drug or alcoholic influence	
Excessive haste		Others (specify)			

(continued)

Basic cause:

Over confidence		Impulsiveness		Over exertion	
Faulty Judgment or poor understanding		Failing to keep attention constantly		Nervousness & fear	
Fatigue		Defective vision		Ill health or sickness	
Slow reaction		Others (specify)			

Root cause:

Inadequate Engg		Improper Design		Inadequate planning & organization	
Inadequate knowledge		Inadequate skill		Inadequate training	
Inadequate supervision		Improper work procedure		Inadequate compliance with standard	
Substandard performance		Inadequate maintenance		Improper inspection	
Others (specify)					

Loss of man days and impact on site works, (if any):

Remarks from Contractor(s) Safety Officer/Engineer:

- Was the victim performing relevant tasks for which he was engaged/employed ? .. Yes / No

- Was the Supervisor present on work-site during the incident .. Yes / No

- Have the causes of incident rightly identified ? .. Yes / No

Cause of Accident was .....

Remedial measures recommended by **Safety Officer of Contractor** for avoiding similar incident in future: .....
.....
.....

Intimation to local authorities (District Collector/Local Police Station/ESI authority): Yes / No / NA. If Yes, to whom .....

Safety Officer
(Signature and Name)
Stamp of Contractor

Site Head/Resident Construction Manager
(Signature and Name)

To:
Owner
RCM/Site-in-Charge DASTUR (3 copies)
Divisional Head (Construction) through RCM
Project Manager, DASTUR, through RCM

NEAR MISS INCIDENT/DANGEROUS OCCURRENCE SUGGESTED PROFORMA (To be submitted within 24 hours)

- **Near Miss:** Human injury escaped and no damage to property, equipment or interruption to work.
- **Dangerous Occurrence:** Damage to property, equipment or interruption of work, but not resulting in personal injury/illness, e.g. fire incident, collapse of structure, crane failure, etc.

Report No.: .....

Name of Site: ..... Date: .....

Name of Work: ..... Contractor: .....

Incident reported by :

Date & Time of incident :

Location :

Brief description of incident:

Probable cause of incident:

Suggested corrective action:

Steps taken to avoid recurrence: Yes ☐ No. ☐

To: Owner
- RCM/Site-in-Charge DASTUR (3 copies)
- Divisional Head (Construction) through RCM
- Project Manager, DASTUR, through RCM

MONTHLY HEALTH, SAFETY & ENVIRONMENT (HSE) REPORT

(To be submitted by each Contractor)

Actual work start Date:..... For the Month of: .....
Project: ..... Report No.: .....
Name of Contractor: ..... Status as on: .....
Name of Work: ..... Job No.: .....

Item	Upto Previous Month	This Month	Cumulative
1. Average no. of Staff & Workmen (average daily headcount, not man days)			
2. Man-hours worked			
3. No. of induction programmes conducted			
4. No. of HSE meetings organized at site			
5. No. of HSE awareness programmes conducted at site			
6. No. of Tool Box Talks conducted			
7. No. of Lost Time Accidents (LTA):			
- Fatal			
- Other LTA			
8. No. of Loss Time Injuries (LTI):			
- Facilities			
- Other LTI			
9. No. of Non-Loss Time Accidents			
10. No. of First Aid Cases			
11. No. of Near Miss Incidents			
12. No. of unsafe acts/practices detected			
13. No. of disciplinary actions taken against staff/workmen			
14. Man-days lost due to accidents			
15. LTA Free man-hours i.e. LTA free man-hours counted from last LTA (enter date: .....)			
16. Frequency Rate (No. of LTA per 2 lakhs man-hours worked)			
17. Se verity Rate (No. of man-days lost per 2 lakhs man-hours worked)			
18. Loss Time Injury Frequency (No. of LTI per 2 lakhs man-hours worked)			
19. No. of activities for which Job Safety Analysis (JSA) completed			
20. No. of incentives/awards given			
21. No. of occasions on which penalty imposed by DASTUR/Owner			
22. No. of Audits conducted			
23. No. of pending NCs in above Audits			
24. Compensation cases raised with Insurance			
25. Compensation cases resolved and paid to workmen			
26. Whether workmen compensation policy taken		Yes	No
27. Whether workmen compensation policy is valid		Yes	No
28. Whether workmen registered under ESI Act, as applicable		Yes	No
Remarks, if any:			

Date: .....

Prepared by Safety Officer
(Signature and Name)

Approved by Site Head/Resident Construction Manager
(Signature and Name)

To: - Owner
- RCM DASTUR (2 copies)

DAILY SAFETY CHECKLIST
(To make use of before start of day's work)

Project	:	Sr. No.	:
Name of the work	:	Date	:
Name of contractor	:	Job No.	:

Description of Job decided to perform:

- **Use of PPE/Safety Gadgets**

Sl. No.	PPEs	Compliance (Yes/No)	Sl. No.	PPEs	Compliance (Yes/No)
1	Safety Helmets		6	Face Shield	
2	Safety Shoes		7	Full body harness	
3	Hand Gloves		8	Fall Arrest System	
4	Dust Musk		9	Safety Net	
5	Safety Goggles		10	Horizontal life-line made of steel wire (dia not less than 8.0 mm)	

(Sl. No. 1 & 2 are compulsory for everyone. Specify and ensure use of other safety gadgets as required for the job).

- **Identify following important unsafe conditions:**

Sl. No.	Conditions	Yes/No
1	Access to work site/emergency escape clear	
2	Soil/Loose earth kept away from excavated pit/slope/ladder provided	
3	Electrical wire/welding lead lying entangled on ground/welding m/c. booth accessible	
4	Elevated Work platform/open ends are protected	
5	Ground area cordoned-off before lifting works ore erection at height/ground area checked and cordoned-off before start of height works	
6	Structural members/erected pipes/wooden boards/pieces etc are safely anchored at heights and are not likely to fall down on people when working beneath	
7	Rope ladders tied-up on tall steel structures, long before are removed to get rid of their use	
8	Any other	

- Indicate actions taken, if status of any of the above items is found ……. No ☐
……

- Specific Safety Guidelines/Precautions, if any (communicated through TBT) …….
……

- Above conditions and PPE compliances are checked by undersigned and correct status are indicated after verification.

*******END OF DOCUMENT*******

ANNEXURE – 7

INTREGITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____

_ , (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for **BHEL/PSSR/KKNPP/TSS/SCT- 063- Handling, transportation, pre-fabrication, assembly, welding, erection, inspection of piping and erection of small-bore piping in Secondary Cycle Piping (QUC, QUG, QUH, LCM90, QUA, QUB, JEA50, LCS, LCT51 system) of Turbine Building (UMA) building, Unit#3 Including Receipt of materials, handling, transportation to contractor shop, un-crating and preservation of the balance, preparation of reports and completion of work with acceptance of EIC. Scope includes arranging all necessary Plant & Machinery, Manpower, Tools & Tackles, Consumables etc. at Unit-3& 4 of 2x1000 MW Kudankulam Nuclear Power Project, Radhapuram Taluk, Tirunelveli District, Tamil Nadu-627 106 .** (hereinafter referred to as "Contract").

The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including infor mation contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process , terminate the contract, if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

4.1 If the Principal has disqualified the Bidder (s) from the tender process before award/ order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.

4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above, the Bidder(s)/ Contractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be-entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee , whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

Section 5 - Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.

6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-

contractors also sign the Integrity Pact.

6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 -Independent External Monitor(s)

8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.

8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.

8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.

8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.

8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities

requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.

8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions

8.9 IEMs should examine the process integrity; they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Principal should be looked into by the CVO of the Principal.

8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IE Ms.

8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.

8.13 The word `Monitor' would include both singular and plural.

Section 9 - Pact Duration

9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.

10.2 Changes and supplements as well as termination notices need to be made in writing.

10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture

or all consortium members.

10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.

10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

For & On behalf of the Principal
(Office Seal) P.BALASUBRAMANI
Senior Manager
MM, SCT, DTG & DOC.
BHEL-PSSR/KKNPP-3&4
Kudankulam - 627 106

For & On behalf of the Bidder/Contractor
(Office Seal)

Place Kudankulam, TN
Date 24.10.2025

Witness: 24/10/25

(Name & Address)
KARTIK P.
MANAGER - TSS/ERECTION
BHEL-PSSR/KKNPP-3&4
KUDANKULAM - 627 106

Witness: _____

(Name & Address) _____