

# **BHEL POWER SECTOR WESTERN REGION**

## **HEALTH, SAFETY AND ENVIRONMENT PLAN**

**FOR PATRATU SITE  
OPERATIONS BY SUB  
CONTRACTOR**

**2018**

**NAGPUR-440001**



PS-WR

**HEALTH, SAFETY AND ENVIRONMENT  
PLAN  
FOR PVUNL 3x800MW Patratu Site**

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**DOCUMENT ISSUE SHEET FOR PATRATU SITE**  
**HEALTH, SAFETY AND ENVIRONMENT PLAN**

**Onus of enforcement of these provision shall primarily rest with Erection/ Commissioning/ Construction Supervisors & Executives supported by HSE Official.**

| PREPARED BY                    |             |            | APPROVED BY             |
|--------------------------------|-------------|------------|-------------------------|
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## 1.0 PURPOSE

- 1.1** The purpose of this HSE Plan is to provide for the systematic identification, evaluation, prevention and control of general workplace hazards, specific job hazards, potential hazards and environmental impacts that may arise from foreseeable conditions during installation and servicing of industrial projects and power plants.
- 1.2** This document shall be followed by CONTRACTOR for EPC Scope at Patratu Site. In case customer specific documents are to be implemented, the same will be followed in conjunction with this document.
- 1.3** Although every effort has been made to make the procedures and guidelines in line with statutory requirements, in case of any discrepancy relevant statutory guidelines or HSES contract requirements must be followed of which the most stringent shall apply.
- 1.4** We will promote and maintain a safe, healthy and environmentally compliant workplace for all employees, contractor, visitors and any others that may be affected by construction activities in line with BHEL's HSE Policy may be displayed in its office and strive for a "GOAL of ZERO RECORDABLE INCIDENTS" on the project.
- 1.5** In case the customer has any specific requirement, the same is to be fulfilled. Customer's HSE Policy and local state/central HSE Rules will be part of HSE policy.
- 1.6** Vendors have to comply requirements of HSE & Statutory requirement in line with BHEL HSE plan, NTPC Safety requirement, Jharkhand/BOCW/Central statutory requirement.
- 1.7** Agencies are to get registered (to take membership) from Safety Council of India, Mumbai/National Safety Council.

## 2 SCOPE

The document is applicable for installation and commissioning of Boiler, Turbine and Generator - 3x800 MW rating as per the relevant contractual obligations, and provides the minimum HSE requirements to be followed at the project site and labour colony. As an item of note, this HSE Plan is considered a living document and will be revised as/if necessary to ensure contract and regulatory compliance requirements are met during the performance of work on the project.

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



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### 3 OBJECTIVES

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

- Ensure the Health and Safety of all persons at work site are not adversely affected by the work.
- Ensure protection of environment of the work site.
- 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.
- Effectively control, co-ordinate and monitor the activities of all personnel on the Project sites including 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 into account all persons that may be affected by the work.
- Ensure fitness testing of all T&Ps. Lifting appliances like cranes, chain pulley blocks etc. are to be certified by competent authority.
- 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 and disseminate lessons learned.
- Ensure timely implementation of correction, corrective action and preventive action.

#### 3.1 Goals and Targets -

- Achieve a target of 0.8 (max) as incident rate of Total Recordable Cases of non-fatal occupational injuries and illness.
- To achieve "Zero Fatal Accident at Site"
- 100% compliance of all legal/statutory requirements related to HSE.
- 100% Health, Safety and Environmental Induction training attendance for all employees and Contractor.
- 100% High Risk activities to be carried out only after approved Method Statement, HIRA/JSA and Permit to Work are implemented.
- 100% PPEs compliance in high & medium risk activities.
- 100% incident reporting, recording and reviewing for corrective & preventive actions.
- A monthly review shall be scheduled and conducted to assess HSE program compliance and to close any recognized gaps to improve safety management and incident prevention.



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#### 4.0 REFERENCES

- Relevant legislations as listed in Updated Register of Regulations,
- HIRA Register to be prepared at site (standard PSWR level HIRA Register may be referred), Operation Control Procedures (OCP) and Emergency Preparedness and Response Plan
- BIS standards as appear in this Plan.

#### 5.0 MEMORANDUM OF UNDERSTANDING:

After award of work, 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 while 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 within prescribed time limit. Agencies have to comply requirements of HSE & Statutory requirement in line with BHEL HSE plan, NTPC Safety requirement, Jharkhand/BOCW/Central statutory requirement. Agencies are to get registered (to take membership) from Safety Council of India, Mumbai/National Safety Council.

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

Name :

Place & Date:



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## **6.0 TERMS AND DEFINITIONS**

### **6.1 DEFINITIONS**

#### **6.1.1 INCIDENT**

Work- related event(s) in which an injury or ill health (regardless of severity) 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 incident".

#### **6.1.3 MAN-HOUR WORKED**

The total number of employee hours worked by all employees including contractor 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 workday 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**

The injured person is given medical treatment and discharged immediately for reporting on duty or referred for further treatment. First aids are not essentially all reportable cases without counting any lost time.

#### **6.1.5 LOST TIME INJURY**

An injury causing disablement extending beyond the day of the shift on which the incident occurred.

#### **6.1.6 MEDICAL CASES**

An incident involved with an injury or illness that resulted in loss of consciousness or the person receiving medical treatment beyond First Aid.

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 LOST TIME INJURY**



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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.

#### 6.1.8 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:

$$\frac{\text{Number of Recordable Incidents in the period}}{\text{Total Man Hours Worked in the period}} \times 1,000,000$$

#### 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:

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

#### 6.1.10 INCIDENCE RATE

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

$$\frac{\text{Number of LTI in the period}}{\text{Average number of manpower deployed}} \times 1,000,000$$

### 7.0 HSE ORGANISATION

**Number of safety officers :-** The contractor shall deploy at least one qualified safety officer and additional One HSE Officer per 250 workers or part thereof in each package. In addition, there must be one safety-steward/ safety-supervisor for every 50 workers.

Safety trainers – Agency with manpower of 250 & above has to engage safety trainers for safety induction, regular safety training. Qualification and experience of safety trainers will be similar to that of safety officers. These safety trainers will be under administrative control of BHEL HSE in charge and BHEL will decide safety trainers deployment & engagement. Even in no. of occasions, these safety trainers will be required to give safety training for personnels of different agencies/BHEL/customer. Safety Supervisors /stewards should have adequate erection experience with sufficient safety exposures during erection and needs to be further retrained at site by BHEL/Customer safety team.



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In case of height working, no. of safety stewards are to be increased to keep close vigil on safety aspects and floor wise safety stewards are to be ensured by agencies.

**Deployment:** The contractor should deploy safety officers and safety-steward/ Safety-supervisor, as per requirement given above since initial stage and add more in proportion to the added strength in work force. Any delay in deployment will attract a penalty for Safety officer/ Safety trainer Rs. 30,000/- & for safety steward/ Safety-supervisor Rs. 20,000/- per man month for the delayed period. Pro rata recovery respectively for partial absentism counting 24 days in a month.

### 7.1 QUALIFICATIONS FOR HSE PERSONNEL TO BE DEPLOYED BY THE VENDOR:-

- Agencies HSE officers should have qualification as per rule 209 of Bocw act central rule 1998 with requisite experience. No. of HSE Officers/engineers will be @ one HSE officer/Engineer for each 250 workers.
- Agencies HSE officers will be part of BHEL HSE Team and they will be responsible for giving training on HSE issues in addition to normal field works and other normal site requirements.

| Designation                                            | Qualification                                                                                                                                                                                                                | Experience                                                                  |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| HSE officer<br>(CONTRACTOR<br>/Construction<br>Agency) | Degree or Diploma in<br>Engineering/ Technology with<br>full time diploma in Industrial<br>Safety.<br>Trained in First Aid, CPR and<br>Basic Rescue Techniques<br>Knowledge in English & Hindi,<br>optionally local language | Minimum two years for<br>degree holder and five years<br>for diploma holder |

### 7.3 RESPONSIBILITIES

#### 7.3.5 SITE IN - CHARGE OF 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 clause 7.0
- 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 coordinator.
- Shall screen all workmen for health and competence requirement before engaging for the job and periodically thereafter as required.



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- 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 Regulation R57.
- Shall ensure that all T&Ps engaged are tested for fitness and have valid certificates from competent authorities.
- 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).
- Shall ensure that person working above 2.0 meter should use Safety Harness tied to a life line/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 contractor are working safely and do not 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, mockdrill, 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 housekeeping.
- Shall ensure adequate valid fire extinguishers are provided at the work site.
- Shall ensure availability of sufficient number of toilets /restrooms and adequate drinking water at work site and labour colony.
- Shall ensure adequate emergency preparedness
- Temporary fencing should be done for open edges if Hand – railings and Toe-guards are not available.



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- Shall sign Memorandum of Understanding (MoU) for compliance to BHEL's HSE Plan for Site Operations as per clause 5.0
- Temporary fencing should be done for open edges if Hand – railings and Toe-guards are not available.
- Preparation of method statement,HIRA,Job Safety analysis,permit to work ,Lifting plans,and all supporting documents as required for starting & continuation of work/job is in vendor's scope.

#### **7.3.6 SITE HSE COMMITTEE**

- Site HSE committee shall consist of BHEL Construction Manager (Chairman), Site BHEL HSE coordinator (Secretary/Convener), BHEL HOS (Member), Site In charge of contractor (Member) and Safety officer of contractor (Member).
- Shall evaluate a suitable course of action for the effective implementation of safety system & procedures. Committee will also ensure that all the relevant codes & acts / rules are followed.
- Shall meet monthly and as and when required, to discuss ways and means to eliminate unsafe acts/condition.
- Shall monitor the performance of the HSE programs and suggest improvements as required.
- Shall discuss exception points relating to HSE Audits, sub-contractor HSE practices, incident reports, near miss reports, etc.
- Shall analyze the high risk activities to be undertaken in the near future to identify hazards and decide on the control measures to be taken.
- Shall inspect the site on regular intervals to locate unsafe conditions with reference to the inspection checklist.
- Shall investigate all incidents and strengthening the safety programme by additional precautions, if any based on the incident investigate.

#### **7.3.7 HEALTH, SAFETY AND ENVIRONMENT OFFICER OF 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 Tool-box / other meetings.



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- 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 healthiness.
- 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, contractor on HSE matters.

## **8.0 PLANNING**

### **8.1 MOBILISATION OF MACHINERY/EQUIPMENT/TOOLS**

- As a measure to ensure that machinery, equipment and tools being mobilized to the construction site are fit for purpose and are maintained in safe operating condition and complies with legislative and owner requirement. A documented daily prior to use inspection checklist shall be completed by the end user and periodic inspection shall be arranged by in-house competent authority for acceptance as applicable. All Tools & Plants shall be certified



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by a third party COMPETENT person before these are put to use. As far as possible, these certification shall be made available to site HSE function by the contractor before entry into the site. The certification shall be renewed annually, otherwise, the item shall be withdrawn from the work area.

- The machinery and equipment to be embraced for this purpose shall include but not limited to the following:
  - Mobile cranes.
  - Side Booms.
  - Forklifts.
  - Grinding machine.
  - Drilling machine.
  - Air compressors.
  - Welding machine.
  - Generator sets.
  - Dump Trucks.
  - Excavators.
  - Dozers
  - Grit Blasting Equipment.
  - Hand and power tools.
- 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 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**

- The contractor shall arrange induction and regular health check of their employees as per schedule VII of BOCW rules by a registered medical practitioner.
- The 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.
- Addiction and substance abuse shall also be checked at pre-employment stage and later at random.
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- The contractor shall arrange induction and regular health check of their employees as per schedule VII of BOCW rules by a registered medical practitioner.
- The 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.

### 8.3 ARRANGEMENT OF INFRASTRUCTURE

#### 8.3.1 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 tank shall be ensured at least once in 1 month indicating date of cleaning and next due date.
- Employees should use their own cup for collecting water-no cup shall be shared.
- Potability of water should be tested as per IS10500 at least every year.

#### 8.3.2 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.
- If water used for washing is not potable, it shall be marked “Do Not Drink” in English, Hindi and local language
- Overalls shall be supplied by the contractor to the workmen and adequate facilities shall be provided to enable the painters and other workers to wash during the cessation of work.

#### 8.3.3 LATRINES AND URINALS

- Latrines and urinals shall be provided in every work place,
- Urinals shall also be provided at different elevations.
- They shall be adequately illuminated and shall be maintained in a clean and hygienic condition at all times, by appointing designated person.
- Separate facilities shall be provided for the use of male and female worker if any.
- Hand-wash facility shall be provided.



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#### 8.3.4 FIRST AID FACILITY

- Ensure availability of Qualified First-aider throughout the working hours.
- Every injury shall be treated, recorded and reported.
- The First Aider shall be put through recertification course prior to expiry of the existing certificate.
- List of Qualified first aiders and their contact numbers shall be displayed at conspicuous places.
- The First-aider shall refer any victim to a doctor or any other medical facilities for further treatment if necessary.
- First aid center will be maintained by BHEL and cost will be proportionately recovered from vendors.

#### 8.3.5 FIRST AID BOX

- The contractor shall provide 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 box shall be distinctly marked with a Green Cross on white background.
- Any person using/needing the contents of the first aid box shall immediately report that use/need to their supervisor.
- Details of contents of first aid box is given in **Annexure - A below**
- Monthly inspection of First Aid Box shall be carried out by the owner as per format no. HSEP:13-F01

#### 8.3.6 HEALTH CHECK UP

The persons engaged at the site shall undergo mandatory health checkup from a qualified doctor as per the **format no. HSEP: 13-F02 and Health Record 31-A** 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

#### 8.3.7 PROVISION OF ACCOMODATION/LABOUR COLONY

- The contractor shall arrange for the accommodation of workmen at nearby houses or by making a labour colony.



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- Regular housekeeping of the labour colony shall be ensured.
- Proper sanitation and hygienic conditions shall be maintained and inspected once in a month.
- Adequate number of toilet facilities with water for workers as per norms to be provided. There must be separate toilet for women workers. Drinking water and electricity to be provided at the labour colony.
- Potable water shall be tested once in one year as per IS10500.
- MSDS of LPG shall be put up prominently. This shall be included in the induction training as well.
- The labour colony shall be appropriately secure so that only authorized persons have access to it.
- First aid facility shall be provided in the labour camp under the administration of trained first aiders.
- Common kitchen facilities to be ensured and cooking inside the room to be avoided. The canteen should be maintained in hygienic condition.
- No. of occupants in room to be as per the standards practice.
- Awareness training shall be organized for the workers regarding fire safety, safe use of LPG, Health & Hygiene, and electrical safety etc. on monthly basis.
- Adequate drainage and approach roads to be done.
- Perimeter fencing, security and main gate entrance shall be established and maintained.
- Monthly inspection to be done to ensure the compliance and for opportunity of improvement.
- For sprinkling on roads, it is to be kept in respective vendor's scope.

#### **8.3.8 Medical Centre and Ambulance:**

A medical center shall be maintained at the site with a qualified doctor and trained assistants to cater to the medical needs of the people at the site. Apart from attending medical cases, the center shall also take up proactive measures like vaccination, conducting awareness programme and regular health checkup/ organizing health check-up camp in association with NGOs/ other agencies. The center should have all basic set up for the above purpose.

The ambulance should be available at a specified point like Medical centre or CONTRACTOR site office during the working hours. It should have a oxygen dispensing unit and a small fire extinguisher. The driver should have a valid driving license.

These facilities shall be maintained either by CONTRACTOR or jointly with other package contractor(s) or with Customer as nodal agency.

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

First aid center will be maintained by BHEL and cost will be proportionately recovered from vendors.

#### **8.3.9 PROVISION OF EMERGENCY VEHICLE**

Dedicated emergency vehicle (a four wheeler) shall be made available at workplace by each contractor to handle any emergency.



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### 8.3.10 PEST CONTROL

Regular pest control should be carried out at all offices, mainly laboratories, canteen, labour colony and stores.

### 8.3.11 GENERAL DISCIPLINE:

Workmen under influence of liquor or drug or any other intoxication shall not be permitted to work and sent out of the work area. Workmen shall not be permitted to smoke in work area. None shall be permitted to carry any arms or firearms. The workmen shall report to work on time and follow supervisor's instruction. Use of cell phone particularly in hazardous/high risk jobs like height work, crane operation, etc is strictly prohibited. Cell phone use in general while in the Working Areas on site is regulated to posted designed areas only. Horseplay/ fighting/ consumption of drugs or alcohol shall attract immediate suspension from work for the day atleast or for a longer period as deemed appropriate by site management. Any violation of safety rules/ general rules of work will attract following punishment:

First Offence- Oral warning (Recorded on gate pass)

Second offence- Written warning or suspension from work for a couple of days (Recorded on gate pass)

Third Offence- Suspension from work and withdrawal of gatepass

In case of Third offence, the concerned erection supervisor/ engineer gets a warning. If a erection supervisor /engineer gets such three warnings, he shall get suspended from work.

## 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/CONTRACTOR/contractor/customer at a specific location:

No employee shall be engaged without induction training

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 major hazards & risks, aspects & impacts and mitigation measures related to the jobs to be performed by the person or group of person.
- First aid facility.
- Emergency Contact No.
- Incident reporting.
- Fire prevention and emergency response.
- Rules to be followed in the labour colony (if applicable)
- Use and maintenance of PPEs(i.e., Shoes/Helmets/Goggles/Leg guard/Apron etc.)
- Dress requirement- no loose dress/ ornaments



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- No smoking/alcohol/drug abuse/gambling/fights/theft/damage to property
- General Traffic rules/pedestrian rules
- Cell phone use restrictions
- House keeping
- Security Compliance Requirements
- Environmental Compliance Requirement
- 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 contractor's in-house HSE induction, each employee shall sign an induction training form (format no. HSEP:13-F03) to declare that he had understood the content and shall abide to follow and comply with safe work practices. They may only then be qualified to be issued with a personal I.D. card, for access to the work site.

## 9.2 HSE TOOLBOX TALK

- HSE tool Box talk shall be conducted by frontline foreman/supervisor of contractor to specific work groups prior to the start of work. The tool box is a forum for two-way communication between management and the employees. Pep talk is focused on a specific job. The agenda shall consist of the followings:
  - Details of the jobs 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.
  - Feedback from employees
  - Any doubt clearing session at the end.
- Record of Tool box talk shall be maintained as per **format no. HSEP:13-F11**
- Tool box talk to be conducted at least once a week for the specific work.

### 9.2.1 PRE JOB BRIEFING

A separate documented daily pre job briefing must be conducted at the actual job/work site location with the supervisor and work crew, to cover working environment/conditions, safe work practices for the activities to be carried out, required PPE and review of the work package, JSA and permit requirements. Each crew member and the supervisor will signoff on the pre job briefing form, and form will be submitted to the HSE department at the end of each shift.



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### 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 twice in a year. The training shall include following topics:

- Use of PPEs
- Use of fall arrester, retractable fall arrester, life line, safety nets, Fall protection training 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/ 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
  - 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.
- Each Skilled labour fitter, electrician, rigger, scaffolder, carpenter etc. will pass through the trade test (oral, written and/ or practical) conducted at site by the respective engineer. A pass sticker of qualified person to be marked on their ID Card/Gate Pass.

**9.4.1** HSE Induction for Visitors: No visitors are allowed to visit the construction site without safety induction, mandatory PPEs, and designated escort.

**9.4.2** Safety Induction for all (Staff/engineers/sub-Contractor officials/supervisors): It is compulsory to provide safety induction and briefing about the site HSE management systems, requirements and individual's roles & responsibility to carry out the activities in safe manner, before deploying them.



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## **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. Monthly safety shall be observed by BHEL/Customer.Agency Site In charge alongwith his safety team and workers are to compulsorily particaipate in these monthly safety mettings.Agency has to display safety posters/banners at stores/office/work place and need to be changed from time to time.No.of safety posters to be diaplayed will be decided jointly by agency and BHEL/Customer.

### **9.5.4 HSE awareness programme**

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

## **10. PROVISION OF PPEs**

The following matrix recommends usage of minimum PPEs against the respective job. The PPEs shall conform to the relevant standards as listed and bear ISI/ ANSI mark. If there is no IS for any PPE, ANSI shall be followed. 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.



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The table below may not be exhaustive:

| Sl. No | Type of work                     | PPEs                                                                                                                                                     |
|--------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | Concrete and asphalt mixing      | Nose mask, hand glove, apron and gum boot                                                                                                                |
| 2      | Welders/Grinders/<br>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                                                                                                                                   |

|                                            |                                                                        |
|--------------------------------------------|------------------------------------------------------------------------|
| IS: 2925 – 1984                            | Industrial Safety Helmets.                                             |
| IS: 4770 – 1968                            | Rubber gloves for electrical purposes.                                 |
| IS: 6994 – 1973<br>(Part-I)                | Industrial Safety Gloves (Leather & Cotton Gloves).                    |
| IS: 1989 – 1986<br>(Part-I-II)             | Leather safety boots and shoes.                                        |
| IS: 3738 – 1975                            | Rubber knee boots.                                                     |
| IS: 5557 – 1969                            | Industrial and Safety rubber knee boots.                               |
| IS: 6519 – 1971                            | Code of practice for selections care and repair of Safety footwear.    |
| IS: 24226 – 1985                           | Leather Safety footwear having direct molding sole.                    |
| IS: 5983 – 1978                            | Eye protectors.                                                        |
| IS: 9167 – 1979                            | Ear protectors.                                                        |
| IS: 3521 – 1983                            | Industrial Safety Belts and Harness                                    |
| IS: 8519 -1977                             | Guide for selection of industrial Safety equipment for body protection |
| IS:9473-<br>2002,14166-<br>1994,14746-1999 | Respiratory Protective Devices                                         |



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Besides the PPEs mentioned above, all the persons (workers and visitors) entering the work area shall use/wear safety helmet, safety shoes, safety glasses and Yellow vest (fluorescent), with full length trousers and 4" shirt sleeves. The workers and visitors shall use any other PPEs as deemed appropriate for the area of work.

Where workers are employed in sewers and manholes, which are in use, the 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.

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.

BHEL Shall maintain buffer stock of PPEs. If sub agency fail to provide the PPEs to worker the same may be issued by BHEL and cost for the PPEs debited to the Sub agency from regular RA Bill with 30 % overhead charges.

The body harnesses shall be serial numbered.

Colour scheme for Helmets:

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

#### **11.0 Power supply & upkeep of installation -**

- Only licensed person shall maintain and operate power installations.
- All distribution boxes shall be locked and the key controlled by site management of concerned contractor.
- Electrical appliance shall have proper earthing and for appliances equal to & more than 415V shall have two separate earthing as per IS:3043:1987
- All electrical supply shall be provided through ELCB of 30mA sensitivity.
- The working condition and sensitivity of ELCB shall be checked periodically.
- All fuses and fuse wires shall be of standard size and rating.
- All power supplies through cables shall be underground or overhead with height > 3mtrs.
- TAG IN/ TAG OUT must be in force in Switch Room and all Distribution Boxes for live power line. The authorized person's name and contact no shall be displayed



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## 12.0 Lifting Operations:

All the cranes and lifting tools & tackles shall be inspected on daily basis and as well as formal monthly by expert and as per the law third party for annual certification. These shall be tested and certificates of fitness shall be obtained from 3<sup>rd</sup> party state govt approved competent agency before deploying at site and later, periodically. 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 operators cabin of all the lifting equipment.

The manufacturer's instruction for maintenance shall also be followed. All safety measures shall be followed. All tools tackles, lifting appliances; material-handling equipment etc used by the contractor shall be of safe design and construction. The operators, slingers and signalers shall be qualified as per IS 13367 (part-1):2003 "Safe use of cranes- code of practices". 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.

### 12.1 Critical Lifts:

- A written rigging procedure and plan must be prepared for:
  - Lifts or movements over 50 tons
  - Lifting over 75% of crane capacity
  - Erection of process columns, towers or vessels, NSSS and turbine/generator systems.
  - Lifts over operating units/equipment
  - Other instances deemed prudent by the Company.
  - Lifts or movements of unusual difficulty, geometry or rigging.
  - Where required by contract.
  - Lifting a Personnel Basket.

**Note:- Tandem operation for materials handling/ erection/ lifting/ lowering from heights needs to be approved by BHEL/ Customer.**

### 12.5 CRANES AND HOISTING EQUIPMENTS:

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

- On every crane or piece of hoisting equipment notices of all rated load capacities, recommended operating speeds, and any hazard warnings or special instructions shall be conspicuously posted. All instructions and warning shall be visible from the equipment operator's station.



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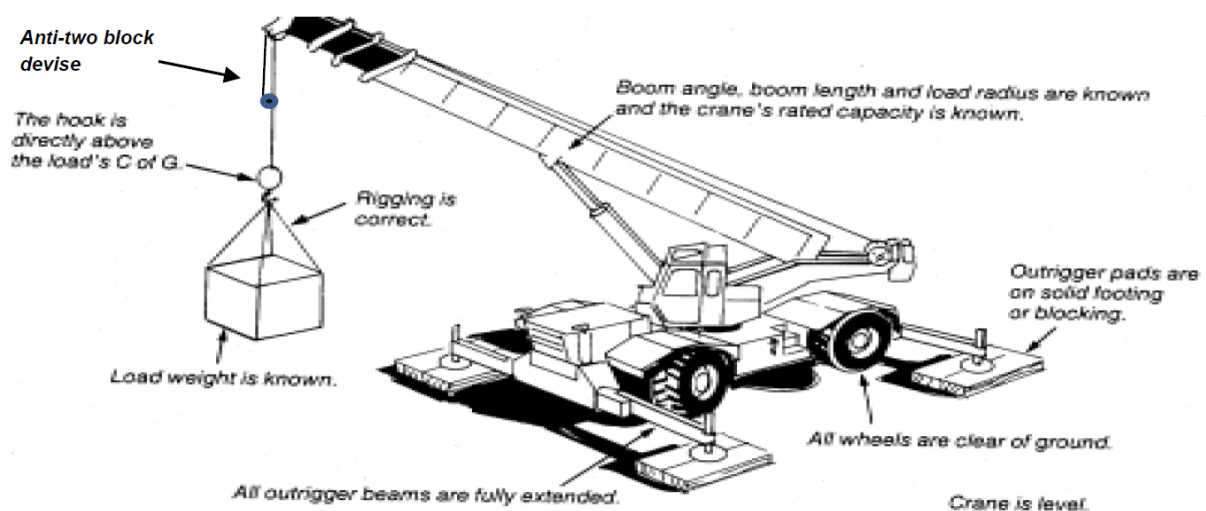
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- Cranes shall have an Anti Two-block safety device installed
- All mobile cranes shall have overload and backup alarms
- Load angle indicators and limit switch

All areas within swing radius of cranes that are potentially accessible by pedestrian, vehicular, or equipment movement shall be barricaded to prevent anyone or any vehicle or equipment from being struck by the crane or hoisting equipment, or its load(s).

- No part of the lifting equipment or its load shall be within the distance as specified in the Indian Electricity Act from an energised power line
- Cranes shall have annual certified third party inspection and be inspected before use by the operator. Any defects shall be corrected before use. Logs of crane inspection shall be kept with the crane.
- Make certain that the rigging personnel, material, and equipment have the necessary capabilities for the job and are in safe condition.
- Communicate with person(s) directly responsible for accomplishing the work and / or work area to establish requirements/responsibilities and make certain that all preparatory work is complete.
- Mats/Pads must be used on all lifting equipment, equipped with outriggers.
- Pick and carry must have the load secured to the rig in front.
- Proper crane setup:



#### 12.5.1 Safe Rigging Practices:

- Review the planned operation and requirements with the operator and rigging crew.



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- Ensure a pre-lift meeting is conducted with crane operator, tagline operator, signal personnel, and Safety Manager.
- Designate a qualified person from the rigging crew to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.
- Clear the lift area of all unnecessary personnel.
- Hydras shall only be allowed for loading & unloading works & shall not be allowed to move with load. Hydras are not allowed for materials transport.
- Cranes, D-Shackles, Slings all lifting equipment are to be tested by statutory authorities/approved by Third Party agency. Agencies within their cost have to do it at least once in a year or as per applicable clauses regarding frequency of testing, inspection, fitness certification requirement.

### **13.0 Fire prevention, protection & preparedness –**

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

The purpose of which is to prevent -

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

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

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

- Area where Hot work activities are carried out (Gas cutting / Welding/ any other spark producing work) above a working spot, a GI / fire-resistant non-asbestos sheet or suitable material shall be placed to prevent the fall of hot sparks. A bucket of water shall be kept nearby while doing hot work



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- Hot work shall be preferably carried out in a designated area with a standing Hot Work Permit, to be renewed monthly. The designated area shall have fire extinguishers.
- Any hot work outside designated area shall require a Hot Work permit and fire watch.
- No flammable material shall be stored within 35 feet from any fire load.
- Necessary fire extinguishers shall be kept at accessible area as per the chart below:

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

- Emergency telephone number to be displayed at all conspicuous places.

**General flammable material storage requirements:**

- All flammable material shall be stored in deigned areas and/or in flammable storage cabinets, as necessary.
- Fire extinguishers shall be located near by and have unobstructed access.

**14.0 Illumination:**

- Each phase of construction will create its own illumination and lighting challenges; whether the work is related to confined spaces, hazardous atmospheres, stairways, pedestrian walkways or night work. Proper and adequate illumination is critical in order to perform the work in a safe and healthy manner. The following are the minimum requirements: Lamp (hand held) shall not be powered by mains supply but either by 24V or dry cells.



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- Temporary lighting used in damp and / or hazardous locations and confined areas must be of not more than 24 volts.
- Lamps shall be protected by suitable guards where necessary to prevent danger, in case of breakage of lamp. Broken and burnt-out bulbs must be replaced immediately.
- Emergency lighting provision for night work shall be made to minimise danger in case of main supply failure.
- Adequate and suitable light shall be provided at all work places & their approaches including passage ways as per 29 CFR 1926.56

| Foot-Candles | Area of Operation                                                                                                                                                                                                                                                 |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5            | General construction area lighting.                                                                                                                                                                                                                               |
| 3            | General construction areas, concrete placement, excavation and waste areas, access ways, active storage areas, loading platforms, refueling, and field maintenance areas.                                                                                         |
| 5            | Indoors: warehouses, corridors, hallways, and exit ways.                                                                                                                                                                                                          |
| 5            | Tunnels, shafts, and general underground work areas: (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Bureau of Mines approved cap lights shall be acceptable for use in the tunnel heading) |
| 10           | General construction plant and shops (e.g., batch plants, screening plants, mechanical and electrical equipment rooms, carpenter shops, rigging lofts and active store rooms, mess halls, and indoor toilets and workrooms.)                                      |
| 30           | First aid stations, infirmaries, and offices.                                                                                                                                                                                                                     |

**15.0 RADIOGRAPHY:** Wherever the process requires examination by radiography,

- CONTRACTOR /sub-contractor shall use approved radiography contractor for the work on site.
- Site radiography shall be carried out after advance notification to the HSE officer and client personnel. All radiography on the site shall be subject to receipt of client/BHEL work permit and shall normally be performed outside of normal working hours. No ionising radiation sources shall be left unsupervised whilst on site.
- A minimum of 2 qualified persons from the radiography contractor are required for each activity involving ionising radiation. Adequate warning signs shall be posted on barriers and the work area shall be marked off at a safe distance with tape or hard barricades prior to starting radiography by concerned job sub-contractor.



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- All personal executing radiography operations shall carry calibrated radiation monitoring devices at all times.
- The storage of radioactive sources on the site is prohibited, they shall be present only for the time required to complete the work. Whilst not in use, radiation sources and their container shall be secured in a safe location with adequate warning signs displayed as per AERB guidelines.

#### **16.0 Confined Space Entry: ( contractor to have Oxymeter and Toxic Gas meter)**

A hazard assessment must be completed prior to any entry into a confined space. The hazard assessment must identify the sequence of work to be performed in the confined space, the specific hazards known or anticipated, and the control measures to be implemented to eliminate or reduce each of the hazards to an acceptable level. No entry must be permitted until the hazard assessment has been reviewed and discussed by all persons engaged in the activity. Personnel who enter confined spaces must be trained per role e.g. entrant (worker), confined space supervisor & attendant, and must be informed of known or potential hazards associated with the confined spaces to be entered. Number of persons entering shall be kept at minimum. All confined spaces must be inventoried at site and kept on file. Confined spaces must be posted at the entrance with similar type wording "DANGER - Do Not Enter – Confined Space - Permit Required".



#### **17.0 Welding and Gas Cutting Operations**

- When possible, items to be welded, cut, heated, etc. shall be moved to a safe location free of combustible or flammable material. If this is not possible, then all combustibles/flammables that can be removed from the area shall be removed within a 35 foot circumference and a positive means of confining arcs and sparks generated by the process shall be taken and additional person(s) shall be stationed as fire watch for the area(s) still exposed, along with obtaining the Hot Work Permit as applicable.
- Appropriate fire-fighting equipment is to be available in close proximity of any welding and gas cutting operations at all times.



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- Drums, tanks, and similar containers that have contained flammable or toxic material shall not be welded, cut, or heated until they have been made safe by water filling, thorough cleansing, or similar accepted practices. The container shall also be ventilated during the welding, cutting, or heating process.
- Proper ventilation is required for any welding or torch operations performed in a confined space.
- Any welding or gas cutting operations performed on metals of toxic compounds or coating such as zinc, stainless steel, lead, cadmium, chromium, and beryllium shall be properly ventilated and/or proper respiratory protection shall be worn by any person that could be exposed to fumes, vapors, and gasses created by the welding and gas cutting processes.
- Wherever it is practical, all arc welding operations shall be shielded to prevent direct light rays or sparks from contacting persons in the vicinity or from reaching areas normally used to travel through or into the vicinity. Where this is not practical, persons who shall be in the area are to use proper eye and skin protection. Other persons who are not participating in the welding or gas cutting operations are not to be allowed into the hazard zone.
- Welders and other employees who are exposed to arc welding radiation shall wear suitable clothing and protective apparel to prevent burns and other types of ultraviolet radiation damage to the skin.
- Arc welding machines shall be shut down when being moved or when they are not in continuous use.
- Electrode holders left unattended shall have electrodes removed and shall not be left where they might contact employees or conducting objects.
- Arc welding power supply cable shall be of proper rating and material, e.g. copper.
- Welders shall guard against allowing materials adjacent to or behind them to reflect radiation back toward them or towards others in the area. Reflected radiation can cause skin burns and eye flash burns.
- Compressed gas cylinders shall always be secured from tipping or falling, whether in use, in storage or in transit. The cylinders shall always be secured upright, except during times when actually being hoisted or carried.
- Valve caps shall be in place when cylinders are not in use. Valve caps shall never be used for lifting the cylinder vertically.
- Regulators shall be removed when cylinders are not in use or are in transit, unless



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the cylinder is firmly secured on a special carrier designed for this purpose.

- Cylinders being transported by a powered vehicle shall be secured in an upright position. Gas cylinders are not allowed to be used in man-basket when occupied.
- Cylinders containing oxygen or fuel gasses shall not be taken into confined spaces.
- Oxygen cylinders shall be stored a minimum of (6) meters from fuel gas cylinders or shall have an approved firewall between them.
- Torches shall only be lit by approved strikers; never with matches, cigarette lighters, or hot work.
- While carrying out job at height, the sparks or molten slag shall be prevented from falling down by putting a fire-resistant (non-asbestos) sheet or even MS Sheet. If such can not be provided, the passage of falling sparks or molten slag shall be barricaded till ground floor and any cable/ tubes/ any other objects interfering in the passage shall either be removed or covered with Fire-resistant sheet or M S Sheet.
- Separate sheds for all kinds of gases with clear demarcation/partition of empty & full cylinders/partly filled cylinders of gases are to be by agency. This clause is to be added.
- Flash back arrestors are to be installed for gas cylinders as per standard HSE Procedures by agencies treating it as normal scope of work at no extra cost to BHEL. These items will be regularly inspected jointly by agency, BHEL/ Customer and sufficient stocks are to be maintained to avoid work stoppage.

#### **19.0 WORK AT HEIGHT:**

All work at height above 2 meter above ground level without complete platforms, handrails and other related fall protection shall require a work permit in the prescribed form. This shall require approval by the competent authority. The HSE officer of sub-contractor and subsequently Contractor shall follow the checklist religiously by physically verifying the condition of the work area before recommending for approval.

Whenever a fall hazard or other exposure exists for working at heights more than 2.0m/6ft, the nature and scope of work will be evaluated for conditions and environmental factors before selecting the appropriate fall protection system (active, passive or a combination of measures, as appropriate). A personnel fall protection system must include:

- The only permissible personal fall arrest system is an industry approved safety harness. Employees can use positioning belts with two-D ring attachment points as long as they are used in conjunction with a safety harness. Safety harnesses must be secured to an overhead object of substantial capacity capable of supporting five thousand pounds. In order to accomplish this and ensure 100% protection, the worker may need to use two lanyards. The primary lanyard is never unhooked until the secondary lanyard is secure.



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- 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.

#### **19.1 SCAFFOLDS:**

The safe and efficient erection, use, dismantling, and storage of scaffolds, ladders and elevated work platforms are considered important objectives in maintaining a safe work environment. This procedure provides the guidelines for erection, use, dismantlement, and storage of scaffolding and elevated work platforms.

- There is no such thing as a temporary scaffold. All scaffolds must be erected and maintained to conformed standard (IS 3696 & IS 4014).
- The Scaffold Tagging defines satisfactory, incomplete or defective scaffolds.
- Management must ensure or have each worker who performs work while on a scaffold trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards.
- Agency has to engage and retain trained scaffolding inspectors from statutory authorities/institutes in sufficeient numbers right from job starting till job completion .Scaffolding inspectors have to issue fitness certificates for each scaffolding and apply tags for safe use for respective job application to take care of load,heights etc.
- Scaffolding pipes, clamps, safety nets,floor grills for working platforms are to be made of good quality with proper certifications as per IS Codes.
- Scaffoldings to be used by sub-agencies should be of good quality

#### **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.



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- 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:



### 19.3 Precautions against the fall of materials and persons and collapse of structures

- ❖ Adequate precautions should be taken such as the provision of fencing, or barriers to protect any person who might be injured by the fall of materials, or tools or equipment being raised or lowered. Cradle may be used for lifting materials or men- however this shall be made of MS angles and flats only and duly certified by the HSE officer. Operators may also use bags or box or sound ropes for lifting small tools.
- ❖ Guardrails (including scaffolding) erected over/ajacent working areas must have the guardrails screened (opening < 0.5), to prevent material from falling outside the platform/decking.
- ❖ Guardrails must be able to withstand a 200 pound force exerced in any one direct.
- ❖ Where necessary to prevent danger, guys, stays or supports should be used or other effective precautions should be taken to prevent the collapse of structures or parts of structures that are being erected, maintained, repaired, dismantled or demolished.
- ❖ All openings through which workers are liable to fall should be kept effectively covered or fenced and indicated in the most appropriate manner.
- ❖ As far as practicable, guard-rails and toe-boards in accordance with Indian laws and regulations as depicted below:



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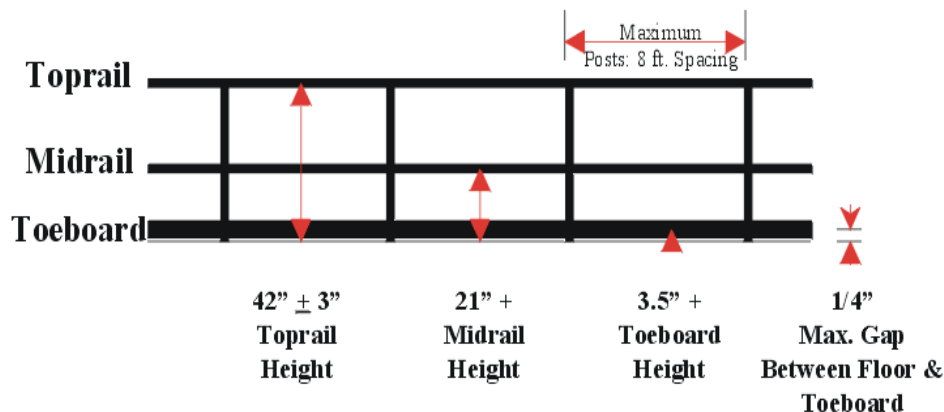
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**Guardrail system**



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

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

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

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

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

**19.4 Safety Nets:**

- ❖ All safety net systems shall meet the requirements of Indian Standard (IS: 5175)
- ❖ Double Net System with one higher mesh size and lower mesh size to be used whenever work at height is in progress. Safety nets to be of 02 layers as followed in IB valley.
- ❖ Safety net mesh openings shall have a maximum size of 6 inches x 6 inches and be secured at each crossing to prevent elongation of the opening. All nets must meet IS: 5175 standard.
- ❖ Safety nets must be installed with sufficient clearance to prevent contact with the surface or structures under them
- ❖ Safety nets shall be installed as close as possible to the working level but in no case more than 25 feet below the working level.



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- ❖ The safety nets shall extend out at least 8 ft. from the side of the open edge.
- ❖ Material, equipment and other items that fall into the net are to be promptly removed.
- ❖ Safety nets are to be inspected before use and then daily for wear or damage caused by falling materials.
- ❖ Safety net installation shall be inspected by a competent person.
- ❖ Safety nets must be installed below the working decks of the super structure for protection from falls of personnel and material.
- ❖ Safety nets and safety net installations must be drop-tested at the jobsite:
  - After initial installation and before being used.
  - Whenever relocated.
  - After major repair.
  - At 6-month intervals if left in one place.
- ❖ The drop test consists of a 400 pound bag of sand 28-32 inches in diameter dropped into the net from the highest surface at which employees are exposed to fall hazards, but not from less than 42 inches above that level.
- ❖ When the employer can demonstrate that it is unreasonable to perform the drop-test described above, the employer or a designated competent person shall certify that the net and net installation have sufficient clearance and impact absorption by preparing a certification record prior to the net being used as a fall protection system. The certification must include:
  - Identification of the net and net installation.
  - Date that it was determined that the net and net installation were in compliance.
  - Signature of the person making the determination and certification.

## **20.0 NIGHT SHIFT OPERATION:**

Night shift operation shall be avoided to the extent possible, so shall be any complicated or heavy job. However, prior administrative approval shall be obtained from BHEL for such operation and a detailed work plan developed. The following shall be ensured:

- i. Adequate illumination along access, work area and egress
- ii. Supervision
- iii. Issue of strict instruction to workmen not to stray away from the work area and earmarked approach
- iv. Non-deployment of women workforce
- v. Non-deployment of fatigued workforce
- vi. Vacating the area immediately on completion of the job
- vii. Informing first-aid facility and ambulance in advance



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## **21.0 CONTROL OF MOVEMENTS AND USE OF HAZARDOUS SUBSTANCES AND CHEMICALS:**

- ❖ The hazardous substances and chemicals shall be stored in a cool, well ventilated, dry and covered space with restricted entry only
- ❖ The loading, unloading, issue and use of these materials shall be strictly in accordance with the Material Safety Data Sheet (MSDS) and under strict supervision. Every supply shall accompany a MSDS as per standard purchase order clause.
- ❖ The site HSE team shall maintain MSDS of all these items and the same shall be shared with the stores or the user as and when required.
- ❖ Each container shall be labeled.
- ❖ Damaged containers are replaced or repaired immediately.
- ❖ The stores shall check the expiry date of perishable chemicals while receiving and store in such a fashion so as to follow First-in-first-out queue.
- ❖ There shall be enough space for movement of material and people in the stores.
- ❖ Bulk chemical storage areas with secondary containment shall be provided so as to arrest spillage from spreading.
- ❖ Dispose the cleanup waste to an industrial waste site or approved temporary storage location.
- ❖ There shall be sufficient fire extinguishers and sand buckets in the stores and at point of use. In case of any spillage, dry sand shall be put on the spill and soaked sand shall be disposed as per the procedure for hazardous waste.
- ❖ Control measures on use of flammable and combustible fluids shall be undertaken to limit quantities in storage area and cabinets.
- ❖ There shall be provision of water preferably flowing one and a face shower at stores and point of use.
- ❖ The persons handling these items shall strictly wear appropriate PPEs like rubber/neoprene gloves, apron, shield etc.
- ❖ No smoking signage should be displayed.

**22.0 CHEMICAL CLEANING:** The chemicals have to be handled as instructed in MSDS. Only authorized person(s) shall be engaged for this job under strict supervision. The waste chemicals shall be drained out to a suitable storage provision and disposed off as per the relevant procedure. The area shall be barricaded while carrying out cleaning operation so as to prevent any unauthorized entry. Once the operation is completed, the surplus material along with the containers shall be returned to stores or scrap yard, as the case may be. The users shall use all appropriate PPEs and shall have water and sand for handling any incidental spillage or splash etc. The area shall be left completely clean before removing barricades.



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## **22.1 PAINTING**

Painting requirements – prior to commencement of painting job, provide a detailed procedure to be implemented by all concerned employees and sub-contractor involved in painting activities.

## **23.0 SAFETY IN THE USE OF HAND TOOLS AND POWER-OPERATED TOOLS**

### **23.1 General provisions**

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

## **24.0 START UP, COMMISSIONING AND TESTING:**

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

These activities shall be personally supervised by the site executive along with the commissioning engineer. The readiness of upstream and downstream system shall be ensured before taking up. These shall be handled strictly by the authorised 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 centre and Fire station shall be intimated about the plan well in



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advance. Lock-out/ Tag-out shall be in place while charging transformer and whenever necessary. Electricians with valid wiremen license only shall be permitted to work on powerlines.

The area and the passage shall be adequately illuminated.

## **25.0 INCIDENT INVESTIGATION, REPORTING AND RECORDS:**

- The contractor shall submit report of all incidents, fires and property damage etc 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 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 work place and compliance shall be verified by BHEL HSE officer and until then, work shall be put on hold by Construction Manager.

## **26.0 HSE COMMUNICATION**

### **26.1 MONTHLY & WEEKLY HSE REPORTING**

- HSE information of Site shall be reported monthly and weekly through Monthly/Weekly Site HSE report (MSHR) as per **format no.** (HSEP:13-F08).
- Weekly,Monthly safety meeting conducted by BHEL/Customer are to be attended compulsorily by site in charge ,senior area engineers,safety officers.In case Sit In charge is not available on meeting day , next in command is to attend meetings.
- Preparation of MSHR shall be done as per " Guidelines for filling up Monthly HSE report"
- The period of reporting shall be 25<sup>th</sup> of the preceding month to 24<sup>th</sup> of the present month and shall be submitted to Regional HQ by the end of the calendar month.

#### **26.1.1 The following documents and reports are to be maintained at site, but not limited to:**

- HSE induction sign in roster
- Pre-employment Health Record Form 31-A.
- HSE Inspections and audit reports
- Environmental monitoring documentation
- Method Statements and JSA
- Training records
- HSE corrective action tracking sheets



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- 3<sup>rd</sup> party inspection report of crane, lifting tools & tackles
- PPE inspections
- First report of incident
- Incident investigation reports
- Chemical inventory documentation
- MSDS of chemicals
- PTW and separate permits of critical activities
- Vehicle and equipment inspections
- Toolbox talk
- Pre job briefings
- Trade test details
- Safety statistics monthly
- Noise monitoring reports
- Written safety violations
- HSE committee and other MOM
- HSE Plan & Emergency Plan
- Weekly & Monthly HSE report to be submitted to OPGC

## **26.2 INCIDENT REPORTING**

- HSE incidents of site shall be reported to Regional HQ and PS-HQ as per HSE procedure for incident investigation, analysis and reporting
- Corrective action shall be immediately implemented at the work place and compliance shall be verified by HSE officer until then work shall be put on hold by Construction Manager.

## **26.3 HSE EVENT REPORTING**

- Important HSE events like HSE training, Medical camp etc. organized at site shall be reported to PS Regional HQ in detail with photographs for publication in diff house magazines
- Celebration of important days like National Safety Day, World Environment Day etc. shall also be reported as mentioned above.

## **27.0 OPERATIONAL CONTROL**

### **27.1 WORK PERMIT SYSTEM**

- The following activities shall come under Work Permit System
  - a. Height working above 2 metres
  - b. Hot work in general and at height
  - c. Confined space
  - d. Radiography
  - e. Hazardous Energy Control (lockout/tagout)



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f. Excavation and Trenching

- "HSE Procedure for Work Permit System" shall be followed while implementing permit system. Where customer is having separate Work Permit System the same shall be followed.
- Permit applicant shall apply for general work permit and other permits as referenced above of particular work activity at particular location before starting of the work with Method Statement and HIRA/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 permit after completion of the work. The closed permit shall be archived in HSE Department of site.
- Agency has to prepare and maintain all permit system documents treating it as their normal scope of work. These work permits are to be approved by BHEL/Customer before starting work and need to be closed on completion of specific jobs. All work permits will be specific period. Permits are to be displayed on job spot and in case job is spreaded in different locations, photocopies of permits are to be kept with area engineers/supervisors.

## 27.2 ENVIRONMENTAL CONTROL

Environment protection has always been given prime importance by BHEL. Environmental damage is a major concern of the principal 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. Chlorofluorocarbons such as carbon tetrachloride and trichloroethylene shall not be used. Waste disposal shall be done in accordance with the guidelines laid down in the project specification.

### Noise Level Chart

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

### 27.2.1 Air pollution Control

- Water sprinkling on road for suppression of fugitive dust to be done regularly.
- Startup and commissioning activities to be planned for compliance with contract, regulatory and permit requirements..
- Required monitoring to be done in the respective work location as applicable.

### 27.2.2 Land and Water Resource Protection

- Only prior approved land by NTPC to be used during construction work.
- Contract clauses to be followed
- All hazardous substances will be stored with proper containment facilities to avoid any release into the water system, causing land/water contamination.



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### 27.3 HOUSEKEEPING

- Keeping the work 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 contractor. Such cleanings has to be done by contractor within quoted rate, on daily basis by an identified group. If such activity is not carried out by 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 contractor.
- Proper housekeeping to be maintained at work place and the following are to be taken care of on daily basis.
- All surplus earth and debris are removed/disposed off from the working areas to identified locations.
- Unused/Surplus cables, steel items and steel scrap lying scattered at different places/elevation within the working areas are removed to identified locations.
- 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 various work area locations
- Different work places for easy collection of scrap/waste. Scrap chute shall be installed to remove scrap from high location.
- Access and egress (stair case, gangways, ladders etc.) path should be free from all scrap and other hindrances.
- Workmen shall be educated through tool box talk about the importance of housekeeping and encourage not to litter.
- 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.
- Fabricated steel structures, pipes & piping materials shall be stacked properly.
- 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.
- Utmost care shall be taken to ensure over all cleanliness and proper upkeep of the working areas
- Keeping the work 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 contractor. Such cleanings has to be done by contractor within quoted rate, on daily basis by an identified group. If such activity is not carried out by 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 contractor.



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## **27.4 WASTE MANAGEMENT**

- There are operations on construction projects that may create hazardous waste, which would require handling, storage, transferring, and transporting. Therefore, hazardous waste guidelines apply for Hazardous Waste Planning:
- 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.

### **27.4.1 Minimum Requirements:**

- Contractor must designate a Material Manager who is responsible for checking delivered materials as potential hazardous waste and informing the Contractor's Safety Manager.
- Contractor who create, may be expected to create or could accidentally create a material that could be classified to be hazardous waste must provide Disposal number (or equivalent) and other pertinent information on file.
- All hazardous waste or waste which could be considered hazardous waste, as determined by the methodology and definitions from environmental regulators must be stored and collected in special areas and properly disposed of by the Contractor.
- No waste haulers, disposers, recyclers, or scavengers will be allowed on the site without the permission of the owner. It will be the responsibility of the Contractor to provide copies of all licenses, permits, and authorizations to the.
- No waste may be removed from the site by any person without the authorization of the Contractor. No waste may be brought onto the site and disposed of using the Contractor's systems or facilities.

## **27.5 EMERGENCY PREPAREDNESS AND RESPONSE (Preferably to be maintained jointly by all stake-holders in the project)**

Emergency preparedness and response plan requirements are to protect worker life and health, and to safeguard property used and stored on the project. This plan is prepared in anticipation of an emergency to prevent losses to any Incident. This plan describes how the organization identifies, respond to and review emergency situations.

This plan covers fire, medical and other environmental incidents. It aims at controlling the emergency and generally mitigating the adverse effects of a major Incident. This plan is applicable to all activities carried at the project site. Determination of hazard potential and identification and assessment of hazards is the first part in emergency planning. This requires systematic study of the site / plant to identify emergencies that can occur.

- Emergency preparedness and response capability of site shall be developed as per Emergency Preparedness and Response plan issued by Regional HQ



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- Availability of adequate number of first aiders and fire warden shall be ensured with BHEL and its contractor
- All the 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.
- Contractor should nominate his supervisor to coordinate and implement the safety measures.
- 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 itself who will have the responsibility to maintain the same.
- First aid center shall be developed at site with trained medical personnel and ambulance. Expenditure of First aid centre and ambulance is on sharing basis with all sub agencies.
- 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

**28.0 Void**

**29.0 HSE AUDIT**

**29.1 INTERNAL HSE AUDIT**

- Internal HSE Audit shall be carried out by HQ as per HSE audit calendar at least once in 3 months
- Qualified HSE auditor shall be engaged for the internal HSE audit.
- HSE checklist shall be used for carrying out audit and report shall be submitted to Head (HSE) of the Region with a copy to concerned site. Final audit report will be issued by Head (HSE) of the Region.
- All non-conformities and observations on HSE shall be disposed off by site in a time bound manner.
- Corrective action and Preventive action on HSE issues issued by Regional HQs shall be implemented by site and reported to HQ



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## 29.2 EXTERNAL HSE AUDIT

- External HSE audit may be carried out by customer/consultant as second party audit or by certification body/government body as third party audit.
- Contractor shall facilitate smooth conduct of HSE audit and make available all the necessary information data which are not confidential in nature.
- All non-conformities and observations on HSE identified during external HSE audit shall be disposed off by contractor 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 CONTRACTOR Regional HQs shall be implemented by site and reported to HQ

## 30.0 MONTHLY HSE REVIEW MEETING

- Site shall hold HSE review meeting every 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.



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**31.0 NON- COMPLIANCE:**

NONCONFORMITY OF SAFETY RULES AND SAFETY APPLIANCES WILL BE VIEWED SERIOUSLY AND BHEL HAS RIGHT TO IMPOSE FINES ON THE SUBCONTRACTOR AS UNDER FOR EVERY INSTANCE OF VIOLATION NOTICED:

| SN  | Violation of Safety Norms                                                                                                          | Fine (in Rs)                                                                   |
|-----|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| 01  | Not Wearing Safety Helmet                                                                                                          | 200/- * Per Person per day                                                     |
| 02. | Not wearing Safety Belt or not anchoring life line                                                                                 | 500/-* Per Person per day                                                      |
| 03  | Not wearing safety shoe                                                                                                            | 200/-* Per Person per day                                                      |
| 04  | Not keeping gas cylinders vertically                                                                                               | 200/- Per Person per day                                                       |
| 05  | Not using flash back arrestors                                                                                                     | 100/- Per Person per day                                                       |
| 06  | Not wearing gloves                                                                                                                 | 50/- * Per Person per day                                                      |
| 07. | Grinding Without Goggles                                                                                                           | 50/- * Per Person per day                                                      |
| 08. | Not using 24 V Supply For Internal Work                                                                                            | 500/- Per Person per day                                                       |
| 09. | Electrical Plugs Not used for hand Machine                                                                                         | 100/-                                                                          |
| 10. | Not Slings 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 25% in Earning Capacity or Major injuries or more permanent disablement to workmen or employees | Penalty @ 2.5% of contract value or 1,00,000/- per Person, which ever is less. |
| 21. | Fatal Incident Resulting in total loss in Earning Capacity & accident causing death:                                               | Penalty @ 10% of contract value or 5,00,000/- per Person, which ever is less.  |



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**Note:-**

1. 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 of the subcontractor. 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.
2. If the Contractor fails in providing safe working environment as per the Safety Rules of BHEL/ NTPC or continues the work even after being instructed to stop the work by the Engineer I/C as provided in the relevant Clause of BHEL's contract with the customer, the Contractor shall be penalized at the rate of Rs. 25,000/- per day or part thereof till the instructions are complied with and so certified by the Engineer I/C.
3. Permanent disablement shall have the same meaning as indicated in The workmen's Compensation Act' 1923. The penalty mentioned above shall be in addition to the compensation payable to the workmen/ employees under the relevant provisions of the workmen's Compensation laws as applicable from time to time.
4. If two or more fatal accidents occur at same BHEL/ NTPC site under the control of contractor during the period of contract and he has
  - not complied with keeping adequate PPEs in stock or
  - defaulted in providing PPEs to his workmen
  - not followed statutory requirements BHEL/ NTPC safety rules
  - been issued warning notice/s by BHEL/ NTPC head of the project on non observance of safety norms
  - not provided safety training to all his workmen, the contractor can be debarred from getting tender documents in BHEL/ NTPC for two years from the date of last accident.

The safety performance will also be one of the overriding criteria for evaluation of overall performance of the contractors by BHEL/ NTPC. The contractor shall submit the accident data including fatal / non-fatal accidents for the last 3 years where he has undertaken the construction activities Projects-wise along with the tender documents.



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This will also be considered for evolution of tender documents. If the information given by the contractor found incorrect, his contract will be liable to be terminated.

5. The Contractor will make available minimum quantity of all safety equipments and safety PPEs of required specifications as per suggestive list included bidding documents as a part of "List of minimum T & P". Further Contractor will ensure availability of additional requirement for individual worker and safety equipment as per site requirement during execution of the contract till its completion.
6. The Contractor shall abide by the following during Construction and Erection activities:
  - Chain pulley block shall not be used for loads more than 2 (Two) tonne.
  - Hydra shall not be used for material transport.
  - Cage shall necessarily be provided to Monkey ladders of height more than 4 m.
  - Fencing shall be provided to all Electrical Distribution boards and transformers etc.



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### 33.0 FORMATS USED

| SL. No. | Format Name                                      | Format No.   | Rev No. |
|---------|--------------------------------------------------|--------------|---------|
| 01      | Inspection of First Aid Box                      | HSEP:13-F-01 | 00      |
| 02      | Health Check Up                                  | HSEP:13-F-02 | 00      |
| 03      | HSE Induction Training                           | HSEP:13-F-03 | 00      |
| 04      | Tool Box Talk                                    | HSEP:13-F-04 | 00      |
| 05      | MONTHLY HSE REPORT AND HSE INDICES               | HSEP:13-F-05 | 00      |
| 06      | Inspection of PPE                                | HSEP:13-F-06 | 00      |
| 07      | Inspection of T&Ps                               | HSEP:13-F-07 | 00      |
| 08      | Status of T&Ps                                   | HSEP:13-F-08 | 00      |
| 09      | Inspection of Cranes and Winches                 | HSEP:13-F-09 | 00      |
| 10      | Inspection on Height Working                     | HSEP:13-F-10 | 00      |
| 11      | Inspection on Welding & Gas Cutting              | HSEP:13-F-11 | 00      |
| 12      | Inspection on Electrical Installation            | HSEP:13-F-12 | 00      |
| 13      | Inspection on Elevator                           | HSEP:13-F-13 | 00      |
| 14      | Hse Performance and Penalty                      | HSEP:13-F-14 | 00      |
| 15      | incident / property damage /fire incident report | HSEP:13-F-15 | 00      |
| 16      | Crane operators Identification cum Authorization | HSEP:13-F-16 | 00      |
| 17      | List of T&P                                      | HSEP:13-F-17 | 00      |



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|    |                                          |              |    |
|----|------------------------------------------|--------------|----|
| 18 | WORK PERMIT- EXCAVATION (DEEP)           | HSEP:13-F-18 | 00 |
| 19 | WORK PERMIT- RADIATION                   | HSEP:13-F-19 | 00 |
| 20 | WORK PERMIT- CONFINED SPACE              | HSEP:13-F-20 | 00 |
| 21 | WORK PERMIT- WORK-AT-HEIGHT (ABOVE 1.8M) | HSEP:13-F-21 | 00 |

**Note: Above format for different work shall be provided by BHEL Site Safety officer.**

**ANNEXURE - A**

**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                                                                                            |



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|         |                                                                                                                                    |
|---------|------------------------------------------------------------------------------------------------------------------------------------|
| (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.