



CHAPTER 1

GENERAL

1.1 INTRODUCTION TO THE COMPANY:

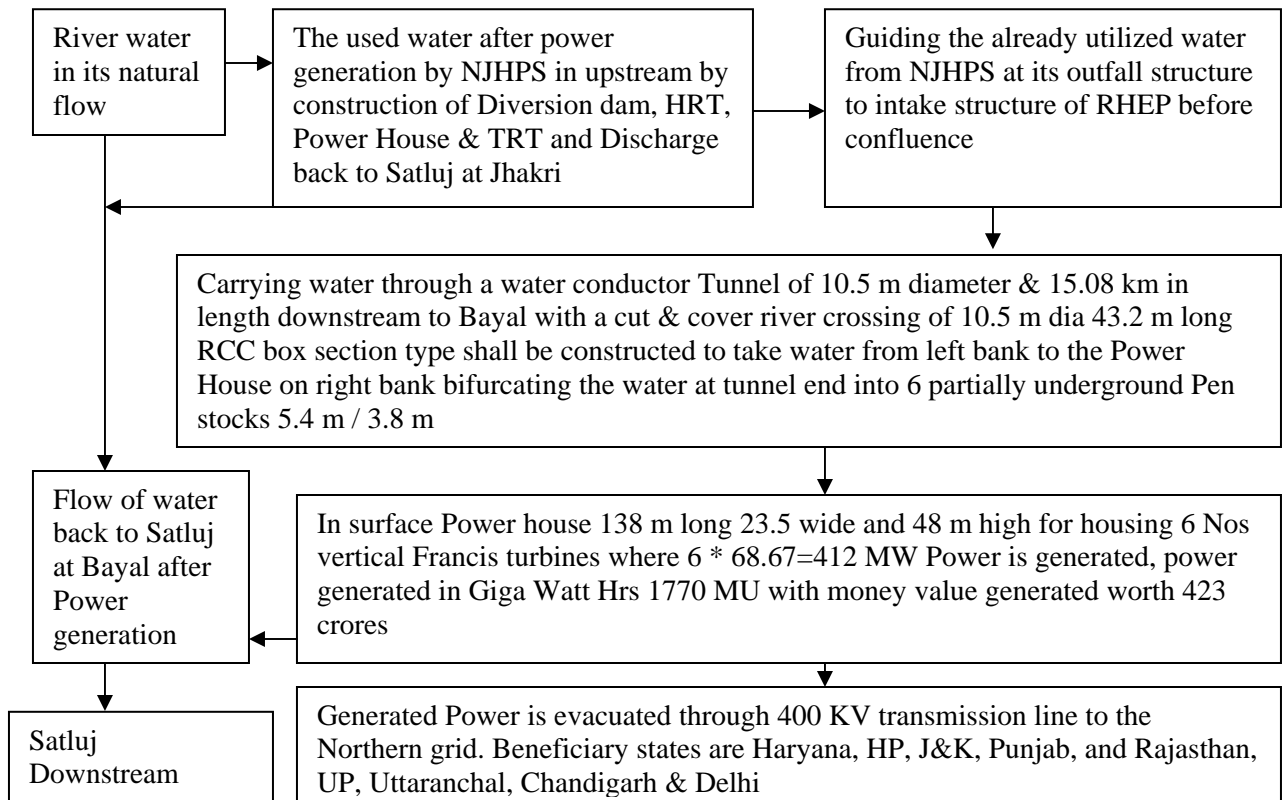
Satluj Jal Vidyut Nigam Limited is one of the largest Hydroelectricity generating Company in Himachal Pradesh. It has a 1500 MW Naptha Jhakri Hydro Power Project in Operation and Maintenance stage located at Jhakri 100 Km from State Capital Shimla.

It is now with the financial assistance of World Bank Constructing 412 MW Rampur Hydroelectric Project at Rampur.

The main activities involved in this project are;

- Construction of Cut and cover Channel
- Construction of approx. 15.2 km long, 10.5 m diameter Head Race Tunnel
- Construction of Surge Shaft
- Erection of Pen Stocks
- Construction of surface Power House
- Construction of Tail Race tunnel
- Erection & Commissioning of Construction Power & Communication System
- Erection & Commissioning of Turbines in power House
- Erection and Commissioning of surface switch yard/Pot head Yard
- Construction of Infra structural works like Roads, Buildings, and Bridges etc.

The Process Flow Chart of Rampur Hydro Electric Project is as Follows;





STANDARDS, POLICIES, OBJECTIVES & GOALS

It is the policy of SJVNL to provide a safe place to work for its employees. It is acknowledged that SJVNL has the ultimate responsibility for compliance with all the requirements of applicable safety rules and orders on the Rampur Hydropower Project (Project).

Each employee has the responsibility to plan, organize and perform work in the safest manner possible, consistent with sound construction practices. All employees will be constantly on the alert for unsafe acts and conditions and to correct them immediately. Management will ensure that all employees – including Subcontractors, are aware of their personal responsibility in maintaining an accident-free and healthy work environment. This project-specific Site Safety and Health Manual have been prepared to assist in implementing this policy. However, all employees understand that this document must be complemented with continuous day-to-day, personal involvement in preventing accidents. When an accident occurs, the degree of loss is determined by chance; therefore, preventing all accidents must be the objective of the safety goal, rather than only those where potential for serious consequences is most apparent. Accidents are preventable and result from unsafe and inefficient procedures or methods, unsafe physical conditions, unsafe equipment, and unsafe personal acts.

THE GOAL OF SJVNL IS TO WORK ACCIDENT FREE

The challenge is to work every day on the job INJURY FREE. This Site Safety and Health Manual lays out the written program that will assist in preventing accidents, however it will be the people on the job who will make it happen.

It is proven that Safety Pays - it pays in reduced insurance costs and in increased productivity achieved from working in a manner that allows employees to have peace of mind. Each employee will have the right to complete a day's work without undue exposure to injury or adverse health impacts.

Safety is a full time commitment on everyone's part, not just the Safety management team. SJVNL has prepared a directive that lays down the necessary SJVNL policy and requirements governing SJVNL's "Health, Security, Safety and Environment" (HSE) efforts to achieve this ambition.

Health, Security, Safety and Environment Directive:

SJVNL's ambition is to demonstrate courage, foresight, respect and a strong sense of responsibility for people and the environment. SJVNL will be in the forefront in environmental care and industrial safety. This directive lays down the necessary SJVNL policy and requirements governing our "Health, Security, Safety and Environment" (HSE) efforts to achieve this ambition.

The directive covers all HSE aspects, applies to all parts of the value chain, and all our other activities.

- SJVNL is determined to work ambitiously, through continuous improvement, for a healthy work environment, safe and secure conduct, and low environmental impact.



- We will design our projects, develop and use technology to produce minimum adverse effect on the environment, making efficient use of energy and resources.
- At the strategic and operational levels we will show due concern to HSE, including the health and safety of our neighbours. When acquiring or entering into commercial agreements with companies that are far from our standards, we shall strive to set ambitious goals to ensure significant improvements in their HSE performance.
- We will systematically seek to deepen our understanding of HSE risks and effects of our activities, promote transparency and routinely publicize our health, security, safety and environment goals and report on status and progress in a dialogue with our stakeholders, including local communities.
- We will continuously work to reduce environmental impacts and risks related to our activities, and contribute to sustainable power generation in a life-cycle perspective.
- We are determined to have no injuries on our premises, and work continuously to avoid work related illnesses, property damage and production loss.
- We will encourage our employees to adopt a healthy, safe life-style for themselves and their families.
- If accidents occur, we shall be prepared to do the utmost to prevent and mitigate injury, damage to the environment, property and SJVNL's reputation. Saving life will be our highest priority.
- We will protect personnel, premises and activities against conscious and negligent unauthorized actions, balancing the company's need for protection of the integrity of employees and third parties.

HSE MANAGEMENT SYSTEM

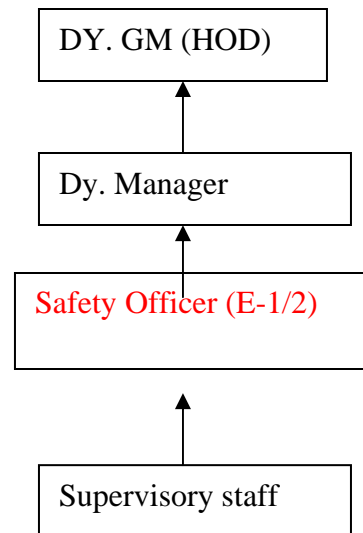
- All our activities shall be in compliance with statutory requirements and SJVNL corporate requirements.
- All SJVNL projects shall be in compliance with the ISO 14001 standard or equivalent.
- We shall achieve our goals through the systematic management of HSE risks and opportunities, and the development of and adherence to a common HSE management system built on good practice and experience, as described in detail in Safety Assurance Plans and Environmental Management Plans of all individual projects.
- SJVNL encourages the use of nationally and internationally recognized standards, guidelines, procedures and acceptance criteria. If needed, sector specifications should be established for issues not covered by such.



- SJVNL will strive to develop Corporate Guidance on Health, Safety, Security and Environmental Management. Wherever possible, SJVNL will encourage adoption of Occupational Health, Safety and Social Accountability Management Systems.

SAFETY DEPARTMENT:

ORGANOGRAM OF SAFETY DEPT (RHEP)



1.2 INDIAN STANDARDS IN CONSTRUCTION SAFETY

Indian Standards have been developed to provide necessary guidance for carrying out tasks at work places providing safe and healthy work environment. Following is a gist of Indian standards that are widely used in construction site;

1. **IS 818:1968** Safety and health requirements in electric and gas welding and cutting operations

Scope:

This code lays down requirements for the protection of

- (a) Persons from injury and illness, and
 - (b) properties (including equipment) from damage by fire and other causes, arising from electric and gas welding and cutting equipment, its installation, operation and maintenance.
- The general provisions of this code of practice are applicable to welding and cutting of metals and other allied processes.

2. **IS 1161:1998** Steel tubes for structural purpose

Scope:



This standard covers the requirements for hot finished welded (HFW), hot finished seamless (HFS), and electric resistance welded (ERW) or High frequency induction welded (HRIW) plain carbon steel tubes for structural purposes.

3. **IS 2750:1964** Specification for steel scaffoldings

Scope:

This standard lays down the requirements for materials, fabrication and performance of steel scaffoldings constructed with tubes, fittings and/or prefabricated frames, suitable for use in normal building construction work.

4. **IS 3016:1982** Fire Protections in welding and cutting operations
(First revision)

Scope:

This standard covers the recommendations for the practices for prevention of loss of life and/or property by fire or explosions arising out of the use of gas and electrical-equipments for the purposes of welding, cutting and similar operations. General precautions recommended cover the normal work area designated for the fabrication and maintenance activities using welding, cutting and allied processes and also special situations having potential fire hazards. Special precautions recommended cover the situations or locations that are susceptible to fire or explosion hazards arising out of the presence of naked flame or sparks, capable of igniting the combustible materials present in the area.

5. **IS 3696:1987** Scaffoldings & ladders (Part I - Scaffoldings)

Scope:

This standard (Part 1) lays down the safety requirements for the erection, use and dismantling of scaffoldings for providing access and for supporting workmen, equipment and materials for any construction work including maintenance, repairs and demolition. The requirements of the various components of the scaffolding, the care in their use and storage are also covered.

IS 3696:1991 Scaffoldings & ladders (Part II - Ladders)

Scope:

This standard (Part 2) lays down the safety requirements for ladders used for the various jobs in general construction work including maintenance and demolition.

6. **IS 3764:1992** Excavation work

Scope:

This standard lays down the requirements for carrying out safety the excavation work, such as trenches, test pits, cellars, borrow pits, cuttings for rail, canal and road formations and all excavations on which the sides of excavations are not trimmed simultaneously to a stable slope.

The requirements laid down in this standard do not apply to the following:

- a) Any part of a trench where the depth is less than 1.5 m;
- b) A trench into which no person is required to enter for any purpose; and



c) Any part of a trench made for a pipeline or conduit if the trench is mechanically excavated, the sections of the pipeline or conduit are permanently assembled before being mechanically placed in the trench and the trench is mechanically back-filled.

7. **IS 4014:1967** Steel tubular scaffolding (Part I and Part II)

Scope:

This code (Part I) covers common definitions and general guidance in regards to selection of materials for tubular scaffoldings.

This code (Part II) covers safety regulations that shall be observed in the design and construction of scaffolding.

8. **IS 4081:1986** Blasting and related drilling operations

Scope:

This standard lays down the safety requirements for blasting and related drilling operations in locations other than mines.

9. **IS 4082:1996** Recommendations on Stacking and storage of
Construction materials and components at site

Scope:

This standard provides general guidance regarding stacking and storage of construction materials and components at site.

10. **IS 4130:1991** Demolition of buildings (Second revision)

Scope:

This standard lays down the safety requirements for carrying out safely the demolition/dismantling of all types of buildings, for example, residential building (load-bearing structure, multistoreyed framed structures), public buildings and factories.

11. **IS 4138:1977** Working in compressed air (First revision)

Scope:

This standard lays down the safety requirements for work in compressed air undertaken in construction works, such as foundations of bridges, docks and tunnels.

12. **IS 4435:1967** Trestles and Ladders (Part II)

Scope:

This standard covers the requirements of wooden ladders and trestles of the following types:

- a) Single-section ladders (standing ladders and step ladders),
- b) Extending ladders,
- c) Steps (swing back), and
- d) Folding trestles.

13. **IS 4756:1978** Tunneling works (first revision)



Scope:

This standard lays down the safety requirements for tunneling and underground excavations in rocks and soft strata. This code does not cover tunnels made in connection with mining operations, gassy tunnels, and also tunnels made in running ground, where special methods like shield tunneling are adopted.

Note - 'Gassy tunnel' wherever used in this code shall mean a tunnel in any part of which flammable gas is present or is likely to occur including a tunnel which is adjacent to or is approaching any such place.

14. **IS 4912:1978** Safety requirements for floor and wall openings, railings and toe boards

Scope:

This standard deals with the safety requirements to be provided in buildings where there is danger of persons or materials falling through floor or wall openings, or from stairways, or catwalks. The recommendations laid down in this standard apply to buildings under construction as well as to buildings after their completion.

15. **IS 5121:1969** Piling and other Deep foundations

Scope:

This standard lays down the safety requirements for piling and other deep foundations as stated below:

- a) Safety measures while working with a piling rig, and
- b) Safety measures while preparing other deep foundations.

16. **IS 5916:1970** Construction involving use of hot bituminous materials

Scope:

This standard lays down the safety requirements for constructions involving the use of hot bituminous materials.

17. **IS 7293:1974** Working with Construction machinery

Scope:

This standard lays down the essential requirements for safety in the operation and maintenance of earth moving, lifting and hoisting, transporting and other construction machinery. It also includes some features of design and construction, which are essential for safe working of construction machinery.

18. **IS 7969:1975** Handling & Storage of Building materials

Scope:

This standard lays down the safety requirements to be observed in handling and storage of building materials at building sites and receiving depots.

An Additional Exhaustive List of OHS related Indian standards is enclosed as Annexure 2



1.3 STATUTORY LEGISLATIONS RELATED TO OCCUPATIONAL HEALTH AND SAFETY

| Statutory Legislation | Authority | Objective | Important Approvals and Permissions |
|--|--|--|---|
| The Factories Act, 1948 The Himachal Pradesh State Factories Rules | Chief Inspector of Factories, Govt. of Himachal Pradesh | <ul style="list-style-type: none"> An Act to consolidate and amend the law regulating labour in factories | <ol style="list-style-type: none"> Permission to construct, extend or take into use any building as a factory. Approval of site and Building Plans Appraisal of site by State Site Appraisal Committee Licence to use as factory Approval for certificate of stability of factory building. |
| The Building & Other Construction Workers (Regulation of Employment & Conditions of Services) Central Rules, 1998 The Building & Other Construction Workers' Welfare Cess Rules, 1998 | Director General of Inspection, Govt. of India / Central Advisory Committee, Govt. of India / Chief Inspector of Inspections / HP State Advisory Committee | <ul style="list-style-type: none"> An Act to regulate the employment and conditions of service of building and other construction workers and to provide for their safety, health and welfare measures and for other matters connected therewith or incidental thereto. | <ol style="list-style-type: none"> Registration of Establishment Approvals for Health and Safety Policy; working areas in a free air tunnel provided with ventilation system; decompression procedure at tunneling work; Chute exceeding twelve meters in height; Trestle scaffold with more than three tiers and working platform more than 4.5 metres above the ground or floor or other surface upon which the scaffold is erected; suspended scaffolds counter-balanced by counter weights and inspection of the cofferdams or caissons for safety by the responsible person Permission to use material-lock for compression and decompression of building workers, where it is impracticable to install both man-lock and material-lock at a tunneling work |
| The Mines Act, 1952 The Mines Rules, 1955 The Mines Vocational Rules, 1966 The Mines Rescue Rules, 1985 | Chief Inspector of Mines, Govt. of India | <ul style="list-style-type: none"> An Act to give effect to the Convention concerning the protection against accidents of workers employed in loading and unloading ships. | |
| The Motor Vehicles Act, 1988 The Motor Vehicles (Central) Rules, 1989 The Motor Transport Workers Act, 1961 | Chief Inspector | <ul style="list-style-type: none"> An Act to consolidate and amend the law relating to motor vehicles. | |
| The Indian Explosives Act, 1884 The Explosives Rules, 1955 The Static & Mobile Pressure Vessels | Chief Controller of Explosives Govt. of India, Nagpur | <ul style="list-style-type: none"> An Act to regulate the manufacture, possession, use, sale, transport, import and export of Explosives. | Explosives Rules <ol style="list-style-type: none"> Authorization of explosives Licenses for import or Export of explosives; Transport; Road Van; Manufacturer & approval of manufacturing |



| Statutory Legislation | Authority | Objective | Important Approvals and Permissions |
|--|--|--|--|
| (unfired) Rules, 1981 The Gas Cylinders Rules, 1981 The Carbide of Calcium Rules | | | process; possession, sale and use of explosives Gas Cylinder Rules 1. Approval of fabrication of cylinders, valves and other fittings 2. Licenses for import; compression of acetylene and filling and possession; 3. Prior approval of specification and plans of premises proposed to be licensed, for alteration |
| The Petroleum Act, 1934 The Petroleum Rules, 1976 | Chief Controller of Explosives Govt. of India, Nagpur | <ul style="list-style-type: none"> An Act to consolidate and amend the law relating to the import, transport, storage, production, refining and blending of petroleum. | 1. Approvals for containers, tank vehicles; design and route of pipeline, Refinery 2. Licences for import of petroleum, carriage of petroleum in bulk by water, Transport of Petroleum class A & B in bulk by land, Storage of petroleum in bulk, Specified purposes as per First Schedule under the Rules 3. Prior approval of specification and plans of premises proposed to be licensed for storage 4. Prior approval for alteration in licensed premises |
| The Environment (Protection) Act, 1986 The Air (Prevention & Control of Pollution) Act, 1981 The Water (Prevention & Control of Pollution) Act, 1974 The Environment Protection Rules, 1986 The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 The Hazardous Wastes (Management & Handling) Rules, 1989 The Environment Clearance of Project Notification, 1994 The Air (Prevention & Control of Pollution) Rules, 1982 | Central Board for Prevention and Control Pollution State Board for Prevention and Control Pollution | <ul style="list-style-type: none"> An Act to provide for the protection and improvement of environment and matters connected therewith. An Act to provide for the prevention, control and abatement of air pollution, for the establishment, with a view to carrying out the aforesaid purposes, of Boards, for conferring on and assigning to such Boards powers and functions relating thereto and for matters connected therewith. An Act to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, for the establishment, with a view to carrying out the purposes aforesaid, of Boards for the prevention and control of water pollution, for conferring on and assigning to such | The Environment Protection Act and Rules 1. Environmental Clearance from Dept. of Environment 2. Approval and Notification of site (in respect of hazardous chemicals) 3. Authorization for handling hazardous wastes (in qualities exceeding regulatory values) 4. Approval for design and layout of the facility for setting up of HW treatment, storage & disposal facility 5. Permission to import and export of Hazardous Wastes 6. Authorization for handling of Bio-medical Wastes (Bio-medical Waste) The Water (Prevention & Control of Pollution) Act 1. Consent for establishment of any industry, operation or process etc. for discharge of trade |



| Statutory Legislation | Authority | Objective | Important Approvals and Permissions |
|---|---|---|--|
| <p>The Water (Prevention & Control of Pollution) Rules, 1975 The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 The Noise Pollution Rules, 2000</p> | | <p>Boards powers and functions relating thereto and for matters connected therewith.</p> | <p>effluents</p> <p>The Air (Prevention & Control of Pollution) Act 1. Consent for establishment or any operation of any industrial plant in air pollution control areas</p> |
| <p>The Public Liability Insurance Act, 1991 The Public Liability Insurance Rules, 1991</p> | <p>District Collector</p> | <ul style="list-style-type: none"> An Act to provide for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling any hazardous substance and for matters connected therewith or incidental thereto. | <p>1. Public Liability Insurance Policy by Owners for handling of hazardous substances</p> |
| <p>The Dangerous Machines (Regulation) Act, 1983</p> | <p>The Controller authorized by HP State Government</p> | <ul style="list-style-type: none"> To provide for regulation of trade and Commerce in production supply, distribution and use of product of any industry manufacturing dangerous Machine. To the welfare of the laboures operating any such machine and for payment of compensation for death or bodily injury suffered by any labour operating such a machine. | |
| <p>The Indian Electricity Act, 2003 The Indian Electricity Rules, 1956</p> | <p>Central Electricity Board, Govt. of India</p> | <ul style="list-style-type: none"> An Act to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalization of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally benign policies, constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal and for matters connected | |



| Statutory Legislation | Authority | Objective | Important Approvals and Permissions |
|--|--------------------------------------|--|---|
| | | therewith or incidental thereto. | |
| The Workmen's Compensation Act, 1923 The Workmen's Compensation Rules, 1924 | Commission of Labour, Govt. of HP | <ul style="list-style-type: none"> To provide welfare measures in form of compensation for loss due to occupational injury and diseases | After any accident with loss of body part or occupational diseases, provide compensation for welfare of personnel or his family |
| The Employees' State Insurance Act, 1948 The Employees' State Insurance (Central) Rules, 1948 | | <ul style="list-style-type: none"> To provide welfare measures in form of compensation for loss due to occupational injury and diseases | After any accident with loss of body part or occupational diseases, provide compensation for welfare of personnel or his family |



CHAPTER 2

SAFETY MANAGEMENT

2.1 SAFETY MANAGEMENT

On a large construction project, such as the Rampur Project, the fundamental aspect of safety management relates to who knows (or ought to know) about hazards and how that knowledge is imparted to those who can control the risks presented by those hazards. The underlying principle is that the burden of having the knowledge is the responsibility for action. Those who know (or ought to know) of a safety issue have a responsibility to pass that information on to those it impacts. Those who are impacted by risks they know about (or ought to know about) have an obligation to assess that risk and take appropriate action and advise others about the results of that action.

Safety on this Project will be the responsibility of everyone on the job – it will be the ultimate team effort involving management, supervision, craft, owner’s representatives, and subcontractors. Everyone is encouraged to think and act as a safety supervisor and is empowered to stop work and immediately correct unsafe acts or conditions.

The SJVNL Site Safety & Health Plan will be continually monitored by the HOD (Safety) who will ensure that all elements of the Manual are effectively working. The HOD Safety will report directly to the General Manager (Projects) and be the point of contact for all issues regarding safety and health on the project. Along with project management, the HOD Safety will establish and enforce the Project’s attitude and commitment towards site safety. Other primary duties of the HOD Safety will include:

- Spending the majority of time in the field actively observing operations.
- Conducting and monitoring orientations, training, and reporting.
- Monitoring management, distribution and proper use of all safety equipment by the contractor.
- Monitor all on and off-site medical including physicians and facilities to be established by the contractor.
- Interfacing continually with the General Manager (Projects) on all matters of safety.
- Maintain records and documentation.
- Conduct accident investigations.

2.1.1 Safety Supervisor(s)

The HOD Safety will manage a staff of Safety Supervisors who will work for extension of the Site Safety and Health Plan to all field operations. Each work site will have a full-time



Safety Supervisor of the contractor who will have no duty other than safety. The Safety Supervisors will have to be trained and qualified. These supervisors are to be deployed by the Contractor.

2.1.2 Competent Person(s)

Each area of work will have a Competent Person deployed by the contractor who will be assigned and readily available to address any safety issue at that location. Competent Persons shall have the knowledge and training to meet all requirements for the work being performed. The Competent Person shall perform routine inspections of the work area, address any instant worker concerns, and understand all emergency and crisis response activities.

2.1.3 Due Diligence

Societal expectations are increasing the pressure on organizations, such as SJVNL, to reduce the risk of illness accidents and incidents in the workplace. In addition to meeting our legal responsibilities, SJVNL will strive to continually improve safety performance and management systems to reduce occupational injury and disease to the lowest practicable level amongst its own employees, and those of Contractors, through the application of following stated principles:

- management accepts that all accidents are preventable
- management accepts responsibility for providing a safe workplace
- employee training is essential
- training to work safely is essential
- all employees are accountable for health and safety

It is recognized, however, that Occupational Health and Safety Legislation and Regulation in Himachal Pradesh and India are also driving forces behind safety management. Legislation and regulations will take precedence over any provisions of SJVNL's safety policies or procedures. Nothing contained in SJVNL's documentation will be construed as somehow lessening the requirements of duly enacted Legislation or Regulation.

The Occupational Health & Safety Management System and its associated definitions of roles and responsibilities has been constructed as a guide to meet the intent of the SJVNL Health, Security, Safety & Environment Directive as well as to meet the expectations of legislators and regulators.

2.2 ACCOUNTABILITY

All employees will be held accountable for their own and their staff or crew's actions. Accountability will include dedication and commitment to all of the process goals that will make the Project work Accident-Free. This Pro-Active Accountability will include:

1. Effective Training - Monthly Mass Safety meetings.
 - Well planned using demonstrations and training tools



- 100% mandatory attendance
- Front-line foremen who conduct training

2. Hazard Identification

- Safety engineering (risk mitigation) part of each Work Plan
- Detailed, operation-specific Job Hazard Analysis
- All documents used in field and constantly updated

3. Proper Indoctrination

- First impression to emphasize importance of safety and accountability
- Provide all necessary training, personal protective equipment
- Multiple-step orientation process that lasts longer than the first day of work

4. Promote Awareness

- Inspection and audit feedback provided directly to foreman and crew
- Visible incentive programs tied to safety performance and personal performance

2.2.1 Zero Tolerance Program

- ZERO TOLERANCE for anyone knowingly creating a hazardous condition, or allowing a hazardous condition to exist without taking appropriate action.
- ZERO TOLERANCE for anyone performing their work or knowingly allowing the work of others to be performed in a hazardous manner.
- ZERO TOLERANCE for anyone purposely causing an injury to another person.
- ZERO TOLERANCE for anyone damaging company vehicles, equipment, and tools, or causing damage to another person's property when taking proper action could have prevented damage.

ZERO TOLERANCE holds all employees – including management and supervision and all Subcontractors - accountable to prevent injuries and prevent property damage. For all parties involved in an accident the consequences of failure to accept that responsibility include: re-orientation, written reprimands, suspension, or termination.

- Violations of our safety policies, whether an injury occurs or not, will subject violators to discipline.
- Disciplinary actions could include:
 - Re-orientation,
 - Verbal reprimand,



2.3 RESPONSIBILITIES / ATTITUDES

Every employee is responsible for full compliance with the Project's Site Safety and Health Plan and be committed to building work Accident-Free. Each JVNL's/Contractor's employee is responsible for daily conformance with all Site Safety Programs including training, documentation, communication, and reporting requirements to ensure full conformance and commitment to providing a safe workplace for each employee, subcontractor, vendor and visitor.

All supervisors and employees are responsible for conforming to all safety requirements, correcting and reporting unsafe acts and conditions, reporting all accidents, maintaining their work areas in a safe manner, and providing a "Safety First" attitude in their work areas at all times. Each person will be held accountable for his or her actions and for the actions of their crew.

Each person on the job has specific duties within the Safety Program, including:

Employee

1. Come to work prepared to work safely.
2. Maintain a positive attitude toward safety at all times.
3. Follow all safety rules at all times.
4. Keep your work areas neat, organized, and professional.
5. Report and correct any unsafe working conditions immediately.
6. Report all accidents immediately to your supervisor.

Foremen/Supervisors

1. Set an example for safety.
2. Maintain a positive attitude toward safety at all times.
3. Enforce the Zero Tolerance Policy at all times.
4. Train your employees to SJVNL standards and rules.
5. Develop Work Plans that take safety into account.
6. Demand that work areas be maintained in a neat, organized and professional manner
7. Ensure that all required safety equipment is available and in good condition.
8. Correct all safety deficiencies immediately.
9. Report and investigate all accidents immediately.

Management

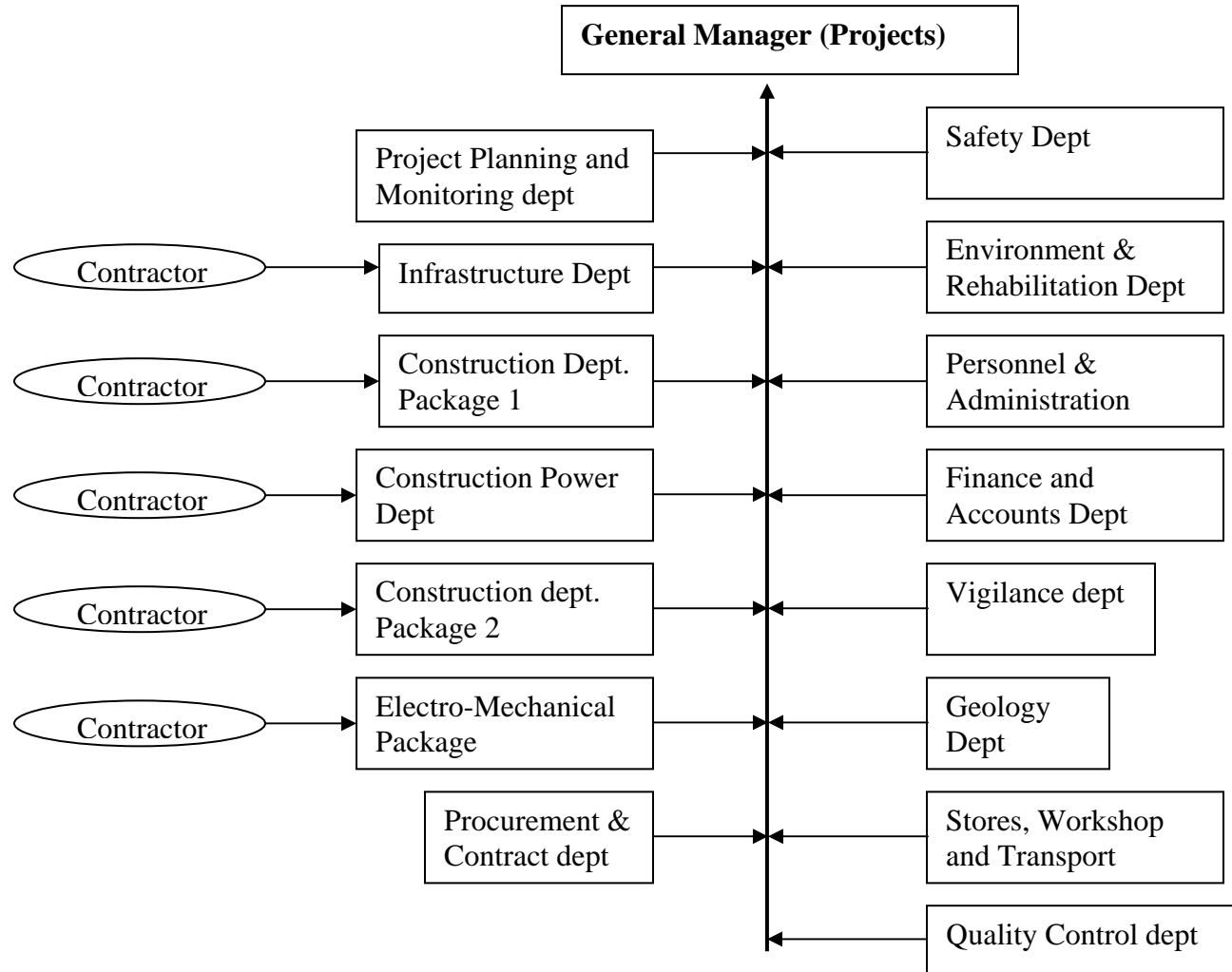
1. Support a "Safety First" attitude, and hold individuals accountable for safety.
2. Maintain a safety focus at all times – lead by example.
3. Establish clear and consistent expectations for safety performance.



4. Assist in providing meaningful safety training in time to deal with potential risks before they occur.
5. Make sure employees get the training they need.



ORGANOGRAM OF RAMPUR HYDROELECTRIC PROJECT, SJVNL





2.5

RESPONSIBILITY MATRIX

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| <p>Head of the Project</p> | <p>The responsibilities of Head of the Project are;</p> <ul style="list-style-type: none"> ➤ To provide the overall directions. ➤ To ensure effective implementation of SJVNL OHS Policy at all levels. ➤ To provide sufficient resources to maintain documented Occupational Health and Safety Management System (OHSMS). ➤ To chair the steering committee meeting to ensure adequate suitability. ➤ To ensure as reasonably practicable the health, safety & welfare of all employees / workmen. ➤ To motivate all levels of the organization for demonstration of higher safety performance and building of accident prevention culture. |
| <p>HODs</p> | <p>The HODs shall:</p> <ul style="list-style-type: none"> ➤ Ensure the hazard risk analysis is carried out in their respective department and its review. ➤ Form the objectives and targets and management programme (MPs) and provide necessary resources. ➤ Submit progress report of MP's to the MR on quarterly basis. ➤ Assist the Core team in training and development of the OCP's and implementation of OHSMS in their department. ➤ Comply with all their responsibilities which is mentioned in this Level I document, register of regulation and emergency preparedness plan etc. ➤ Help in getting the audits done in their respective dept's and close the audit findings. |
| <p>Head of Contracts</p> | <p>To integrate OHS conditions in the contractors procurement process.</p> |
| <p>Duties of Safety Officer</p> | <p>To assist the executive and supervisory staff of the project in spelling out the safety programmes and regulations prescribed in this Manual, a separate safety unit should be included in the project staff</p> <p>The detailed duties of the safety staff shall be as under:-</p> <ul style="list-style-type: none"> ➤ To look into all procedures and practices and examine temporary structures, the failure of any of which may result in an accident. ➤ To go around the works regularly and advise the contractors and the department as to the measures to be taken to ensure safety of the works whether under the contractors or under the department. |



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| | <ul style="list-style-type: none">➤ To see that the rules and regulations laid down in the safety manual are observed. Non-compliance with these regulations, if any, should be brought to the notice of the Safety Engineer.➤ To develop and execute programmes for the training of supervisory personnel in the application and observance of safety practices.➤ To receive and analyse reports of all accidents and fires and initiate corrective actions warranted by the situations.➤ To conduct safety education and propaganda.➤ To recommend revisions or additions to the safety manual on safety measures in the light of project experience.➤ To prepare safety posters, signs, displays, leaflets, bulletins, etc and display them on neat attractive bulletin boards, Cartoons may also be displayed.➤ Suggestions from the workers may also be obtained by means of suggestion boxes that may be kept at various places.➤ Make certain that all Central Government, State Government or local laws and ordinance are complied with.➤ To advise the concerned departments in planning and organizing measures necessary for the effective control of personal injuries.➤ To advise on safety aspects in all job studies and to carry out detailed job safety studies of selected jobs.➤ To check and evaluate the effectiveness of the action taken or proposed to be taken to prevent personal injuries.➤ To advice the purchasing and stores departments in ensuring high quality and availability of personal protective equipment.➤ To provide advice on matters related to carrying out site safety inspections.➤ To carrying out site safety inspections in order to observe the physical conditions of work and the work practices and procedure followed by workers and to render advice on measures to be adopted for removing the unsafe physical conditions and providing unsafe actions by workers.➤ To render advice on matters related to reporting and investigation of industrial accidents and diseases.➤ To investigate selected accidents.➤ To investigate cases of dangerous occurrences and industrial diseases |
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| | <p>contracted reportable under BOCW Central Rules, 1998.</p> <ul style="list-style-type: none"> ➤ To advise on the maintenance of such records as necessary relating to accidents, dangerous occurrences and industrial diseases. ➤ To promote setting up safety committees and act as adviser and catalyst to such committees. ➤ To organize, in association with the concerned departments, Campaigns, competitions, contests and other activities which will develop and maintain the interest of the workers in establishing and maintaining safe conditions of work and procedures. ➤ To design and conduct either independently or in collaboration with the training department, suitable training and educational programs for the prevention of personal injuries. |
| <p>Medical Officer</p> | <p><u>As Project Medical officer:</u></p> <ul style="list-style-type: none"> ➤ Co-ordination with Agencies' medical setups & doctors ➤ Periodical medical examination of : <ul style="list-style-type: none"> ○ Employees through empanelled hospitals ○ Contract labourers through medical setups of agencies/contractors ➤ Identification of hazardous area and conduction of special health survey. ➤ Hygienic survey of canteen and kiosks. ➤ Organizing health camps in surrounding peripheral villages. ➤ Conducting health awareness programs among workmen of the Plant, distribution of leaflets and organizing roadside meetings. |
| <p>Contractors</p> | <p>Before commencing the work, the contractor shall prepare and obtain the approval of the Site Incharge in respect of the following:</p> <ul style="list-style-type: none"> ➤ Safety Plan detailing the safety norms that he shall evolve through a Job Safety Analysis or Hazard Identification & Risk Analysis (HIRA) and constitute a safety organization. ➤ Safety & Health Policy as prescribed under the BOCW Act & Rules. <p>Contractor is also responsible for –</p> <ul style="list-style-type: none"> ➤ Providing constant and adequate supervision of any building or construction work under his control to ensure compliance with the legal provision / standards specified by SJVNL and as prescribed by GCC & Safety Rules for C & E. Sufficient no. of supervisors shall be <u>appointed for this purpose by the contractor.</u> |



- Taking necessary measures to prevent accidents.
- Not to allow any worker to work in an unsafe condition or unsafe equipment.
- Providing adequate and suitable personal protective equipment, wherever they are required, to all concerned personnel. The quality of this equipment shall confirm to BIS or international standards where the national standards are not available. PPE shall be treated as the last line of protection and in no case they will be taken as the substitute of safe work conditions like safe scaffolds, safe platforms, safe access & egress, planned walkways / aisles, well laid-out approach roads, properly designed / engineered work methods etc. The workers shall use the PPE so issued and in case the worker fails to use the same, he will be promptly recovered by the contractor from the workplace.
- A register bearing signature or thumb impression of the worker issued with such PPE will be maintained as the proof of the issue and the same will be made available for verification of the EIC on demand.
- Ensuring protection of all workers from all hazards arising out of their work or due to the work carried out by other in the vicinity.
- Fulfilling necessary license / consents are obtained as required under various statutory provisions and all conditions as laid down in the said license / consent.
- Whenever work is carried out within the premises of an operating power plant or that which is being commissioned after registration of the plant under Factories Act, 1948.

CONTRACTORS' SPECIAL RESPONSIBILITIES:

- The contractors shall at all time exercise reasonable and proper precautions for the safety of the people on the works and shall comply with the provisions of current safety laws, building and construction codes of the State Governments as may be applicable. All machinery and equipment and other sources of physical hazards shall be guarded in accordance with the requirements of this manual and regulations or laws of the State Governments and the Government of India.
- In order to supervise the work from point of view of safety, the contractor shall provide a full time Safety Engineer who shall report and be responsible to the Safety Engineer of the Corporation an executive or his designated representative and shall be responsible for



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| | <p>coordinating the safety programmes.</p> <ul style="list-style-type: none"> ➤ The contractor shall provide all necessary fencing and lights to protect the public from accidents and shall be bound to bear all the expenses of defence of every suit, action & other proceedings of Law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and costs which may be awarded in any such suit, action & proceedings to any such persons or which may with the consent of the contractor be paid to compromise any claim by any person. ➤ Each contractor shall constitute a safety committee comprising at least three members – one each from workers, supervisors and management to review the safety arrangement involved and regular meetings of this committee shall be held and its proceedings supplied to Project Safety Committee. ➤ All PPEs and safety arrangements such as signages necessary for the construction activity are to be provided by Contractors and should not be provided by sub contractors ➤ It is obligatory on contractor not to deploy physically handicapped, mentally challenged employees and children at the construction site. |
| <p>Safety Committee</p> | <p>Safety committee be formed with Head of the Project as chairman, Head of the Safety as Secretary and with equal no. of management and worker representatives. Frequency of meeting will bi-monthly. The Safety committee functions & responsibilities shall be:</p> <ul style="list-style-type: none"> ➤ To identify probable causes of accident and unsafe practices in building or other construction work and to suggest remedial measures. ➤ To stimulate interest of employer and workers in safety by organizing safety weeks, safety competition, talks and film shows on safety, preparing posters or taking similar other measures as and when required or as necessary. ➤ To go round the construction site with a view to check unsafe practices and detect unsafe conditions and to recommend remedial measures for their rectification including First Aid Medical and Welfare facilities. ➤ To look into the health hazards associated with handling different types of explosives, chemicals and other construction material and to suggest remedial measures including use of proper personal protective equipment. ➤ To suggest measures for improving welfare amenities in the |



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| | <p>construction site and other miscellaneous aspects of safety, health and welfare in building or other construction work.</p> <ul style="list-style-type: none"> ➤ To bring to the notice of the employer the hazards associated with use, handling and maintenance of the equipment used during the course of building and other construction work. |
| Project Safety Committee | <p>A Project safety Committee shall be constituted to review and implement OHS requirements at project site, under the Chairmanship of General Manager of the Project, and shall have members from amongst the Site Incharge of each component & project managers of contracting agencies of project, Safety Engineer and representatives of the contractor. The number of the members may vary and shall be decided by the General Manager according to the magnitude of the work and jobs involved. This committee would meet from time to time, generally supervise the Safety arrangements, advise and give suggestions to the Safety Engineer, and consider the reports of the safety engineer.</p> <p>The committee meets once in every two months to review occupational health and safety aspects of the project.</p> |
| Safety Circles | <p>To address & resolve safety issues voluntarily, department wise safety circles are formed. Concerned Department head is the chairman of the committee and meetings are witnessed by Safety Officer.</p> |
| Safety Stewards | <p>To involve working level executives and supervisors in safety promotional activities, Safety Stewards have been formed. The chairman of committee be Engineer-in-Charge of the work. The frequency of meeting is once in two months. Their responsibilities shall be:</p> <ul style="list-style-type: none"> ➤ To arrange / coordinate for personal protective equipment ➤ To identify and remove hazardous conditions ➤ To identify and remove the unsafe conditions / unsafe acts. ➤ To pursue all workers to follow safe working methods, safety rules, use of personal protective equipment etc. ➤ To effectively liaison between HOD, Safety Dept., and Safety committee members. ➤ To conduct Pep talks for SJVNL employees and contract labour on safety issues. ➤ To ensure implementation of statutory requirement and safety clauses in the conditions of contract by the contracting agencies. |
| Fire Safety Committee | <p>To review & suggest fire safety requirements of the project Fire Safety Committee is to be constituted. The committee is headed by DGM and co-ordinated by Head of Safety. The members include safety / fire officers of agencies and Sr. Executives from Electrical, Civil & R&R. Committee meets</p> |



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| | once in every two months. |
| Contractor Safety Taskforce | <p>To involve executives of various departments in implementation of safety standards, compliance of statutory requirements, promoting safety awareness, conducting safety audits, inspections etc. in order to make the construction activities free from hazards.</p> <ul style="list-style-type: none">• To identify the risk / hazardous conditions and unsafe practices in the construction work and suggest remedial measures.• To go round the construction site with a view to check unsafe practices and detect unsafe conditions and to recommend remedial measures for their rectification on the spot as well as during meetings.• To look into health hazards associated with the construction activities while handling different types of chemical and other construction material and to ensure the proper use of the personal protective equipments.• To advise the site-in-charges to stop unsafe practices, if any imminent danger is observed while carrying out the construction activities and issue a warning notice on the spot.• To discuss in the meeting various unsafe conditions / practices observed during inspection. <p>Members will also look into fire hazards in the construction area e.g. accumulation of scrap wood, plastic, jute bags, paper waste etc.</p> |



2.6 PERSONAL PROTECTIVE EQUIPMENT (PPE)

SJVNL and its Contractors will provide all appropriate personal protective equipment to employees that meet or exceeds the current GOI requirements. It will be ensured that PPE is being used properly and they are wearing the proper PPE for the work being performed. PPE must be worn 100% of the time while in work areas.

Following is a list of examples where PPE is required based on the working conditions. The detailed Work Plan and Job Hazard Analysis will specifically identify the PPE that is required.

- Dust: Respiratory protection
- Falling Objects: Foot and leg protection, Eye and face protection, Head protection
- Noise: Hearing protection
- Chemical Exposures: Respiratory protection, Arm and hand protection,
- Sharp Objects: Arm and hand protection, Foot and leg protection
- Pinch Points: Arm and hand protection, Foot and leg protection
- Light Radiation: Eye and face protection

PPE Training

Along with the employee, every Department Head will be responsible for ensuring that the individual has been provided the correct PPE, and is using it correctly.

SJVNL-Furnished PPE

- Hard Hat
- Hearing Protection
- Gloves – as specified for type of work being performed
- Reflective High Visibility Vest or Orange (or lime yellow) Reflective Coveralls
- Steel Toed Boots with steel midsole

Additional equipment that will be provided if required:

- Rubber gloves for concrete
- Face Shields, Chaps, Welding Gloves & Face Shields

2.7 ENFORCEMENT OF SAFETY REGULATIONS:

2.3.1 General Managers / Chief Engineers, Superintending Engineers, Executives Engineers, Assistant Engineers, Supervisors and all other officials in charge of execution of work at the various organizational levels in the project shall ensure strict enforcement of safety regulations in the execution of works.



2.3.2 Contractors should be monthly evaluated for their safety performance.

A general methodology is suggested below;

| Sr. No. | Safety Attributes | Max Marks | Marks Earned By Contractor |
|---------------------|---|------------|----------------------------|
| 1 | Compliance of PPEs | 15 | |
| 2 | Housekeeping | 15 | |
| 3 | Workmen discipline and safety System Compliance | 15 | |
| 4 | Drive towards control of misuse / wastage | 10 | |
| 5 | Participation towards Safety related Programme | 10 | |
| 6 | Non repetition of non conformity | 10 | |
| 7 | Implementation of corrective action within target date and time | 10 | |
| 8 | Safety education and follow up | 5 | |
| 9 | Innovative idea and implementation to save losses | 5 | |
| 10 | Reporting and Information | 5 | |
| Total Points | | 100 | |
| 11 | Incidence Rate | | |

- The above record should be maintained as per periodical safety Inspection.
- Any Sub contractor/contractor scoring less than 65 % marks will come under Unsafe category and will enjoy penalties starting with warning notes to cancellation of contract
- Incidence rate = $\frac{\text{No. of Injuries (Including first aid)} * 1000}{\text{Average no of Workmen}}$

2.8 IMPORTANT SAFETY RULES:

- (i) Contractor shall provide all his contract workers initial safety indoctrination to enable him conduct his work in a safe manner.
- (ii) No employee shall be given a new assignment of work unfamiliar to him without proper introduction as to the hazards incident thereto, both to himself and his fellow employees.
- (iii) Under no circumstances shall an employee hurry or take unnecessary chances when working under hazardous conditions.
- (iv) Employees must not leave naked fires unattended. Smoking shall not be permitted around fire prone areas and adequate fire fighting equipment shall be provided at crucial locations.
- (v) Employees under the influence of any intoxicating beverage, even to the slightest degree should not be permitted to remain at work.



- (vi) There shall be a suitable arrangement at every worksite for rendering prompt and sufficient first aid to the injured under the guidance of a Medical Officer.
- (vii) The staircases and passageways shall be adequately lighted.
- (viii) The employees when working around moving machinery must not be permitted to wear loose garments. Safety shoes are recommended when working in shops or places where materials or tools are likely to fall. Only authorised workers shall be permitted to go behind guardrails or to clean around energized or moving equipment.
- (ix) The employees must use the standard protection equipment intended for each job. Each piece of equipment shall be inspected before and after it is used.

2.9 SAFETY INSPECTION AND SAFETY AUDIT

Safety Inspection Checklists have to be developed for regular inspection of all the activities at the site and monitoring the Health of equipments. Safety personnel should carry out these inspections jointly with frontline department representative for effective identification of the potential hazards and their immediate rectification.

Top management may as often as possible (at least once a month) conduct safety walkabouts/surprise checks of their project site for leading and motivating the personnel for developing safety culture at their workplace. Hazards identified need to be rectified within a defined time frame to avoid any accidents occurrence at site due to any unsafe condition/behaviour of personnel or contract worker.

Safety Audits needs to be carried out frequently and periodically for ensuring and verifying safety management at site.

Internal Safety Audits should be carried out at least once per quarter by a group of cross-functional team. Personnel from corporate safety office may also join them for better understanding the site conditions and suggesting some innovative practices.

External Safety Audits should be carried out at least once per year by professional organization such as National Safety Council of India for reviewing and further strengthening the safety management at the site.

FORMAT FOR SAFETY WALKABOUT/SURPRISE CHECKS

| Name of personnel: | | Sr. No: | |
|-----------------------------------|-------------------------|---|-----------|
| Date of Safety Walkabout: | | | |
| Site/Location of observation: | | | |
| Sr. | Unsafe Condition/Unsafe | Corrective and Preventive | Status of |
| <i>Construction Safety Manual</i> | 27 | <i>Rampur Hydro Electric Project, SJVNL</i> | |



| No. | Behaviour Observed | measures suggested | review |
|-----|--------------------|--------------------|--------|
| | | | |
| | | | |

Signature of inspecting personnel

FORMAT FOR SAFETY INSPECTION

RAMPUR HYDRO ELECTRIC PROJECT

Name of Inspecting personnel:

Sr. No:

Name of Site:

Date & Time of Safety Inspection:

Date of Previous Inspection:

| Sr. No | Safety Features / parameters | Unsafe Condition/Unsafe Behaviour Observed | Corrective and Preventive measures suggested |
|--------|--|--|--|
| 1 | Entry Register at Portal properly maintained | | |
| 2 | PPEs used by executives/staff/workers while working at site | | |
| | Helmets | | |
| | Gum boots | | |
| | Safety belts | | |
| | Gloves | | |
| | Eye shields | | |
| | Gas masks | | |
| 3 | Electrical | | |
| a) | Illumination level is sufficient at site, walkways etc | | |
| b) | Electrical wiring joints/ insulation is proper | | |
| c) | Fencing of sub station is provided | | |
| d) | Top pin plug is provided in the sockets | | |
| e) | Any other observation | | |
| 4 | First aid box is available in proper condition | | |
| 5 | Fire Extinguishers | | |
| a) | Type and number available | | |



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| b) | Date of filling | | |
| c) | Date of refilling | | |
| d) | Date of inspection | | |
| e) | Date of Hydro Test of extinguishers | | |
| 6 | Gas Detection device | | |
| a) | Available | | |
| b) | Record of gas level being maintained and is within permissible limits | | |
| 7 | Ventilation | | |
| a) | General Ventilation Condition | | |
| 8 | Communication system | | |
| a) | Telephone system provided at Face and Portal | | |
| b) | Name of person to whom officer talked | | |
| 9 | Heavy Equipments | | |
| a) | Record of previous maintenance | | |
| b) | Registration No | | |
| c) | Reverse Gear Horn | | |
| d) | Head Lights | | |
| e) | Tail Lights | | |
| 10 | Haulage Road condition | | |
| 11 | Lifting Machinery & Gear | | |
| a) | Certificate of Testing and Inspection available | | |
| b) | SWL of every kind & size of chain displayed | | |
| c) | Operator is competent for the machine usage | | |
| d) | Records of examination & testing of machine properly displayed | | |
| 12 | Transportation & Handling of explosives | | |
| a) | Mode of transport | | |
| b) | Storage | | |
| c) | Name of supervising blaster | | |
| d) | Blaster Licence No | | |
| e) | Validity date of Licence | | |
| 13 | Sign Boards installed and posters pasted at portal showing | | |
| a) | Petrol vehicle not allowed inside the tunnel | | |
| b) | Use Helmets beyond this point | | |
| c) | No smoking near fire prone area | | |



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|----|--|--|--|
| 14 | Potable water available in abundant quantity at face | | |
| 15 | Housekeeping condition | | |
| 16 | Any Other observation | | |
| | | | |
| | | | |
| | | | |

Safety Engineer (RHEP)

Contracting agency Representative

Department/Site Representative (RHEP)

Inspecting personnel

2.10 SAFETY PROGRAM

2.10.1 EMPLOYEE ORIENTATION

One of the most important steps of any Safety Program is the commitment to a focused employee orientation program. The Rampur Project will use a “Four-Step” Orientation Program. The Orientation will be the foundation for all employees to “Think Safety.” The orientation is a graduated process with each step the responsibility of the HOD(Safety), Supervisor, Foreman, and Project Manager. The four steps are:

- 1st Step: Project Administration & Safety Overview
- 2nd Step: Supervisor Interview & Orientation
- 3rd Step: Crew & Task Introduction
- 4th Step: Follow-up Interview

Fundamentals of the Four Step Orientation process are:

1. Instruct all new employees in SJVNL safety requirements and in the safe performance of their jobs before they are permitted to go to work. Supervision will give personal instruction through the use of a project-specific picture book, and task-specific videos.
2. Monitor the new employee’s performance for at least two weeks and correct any deficient habits or methods.
3. Train new employees through the use of Job Hazard Analysis
4. Communicate with the new employee on a personal level. Get to know them and make sure they clearly understand the objectives.

STEP 1 -Project Administration & Safety Overview

Primary Safety Representative’s Role



1. Complete the medical testing required in order to confirm suitability for work. Test results will be known before the employee is put to work.
2. Fill out all necessary administrative paperwork.
3. Show the New Hire Orientation video.
4. Issue a copy of the SJVNL Basic Safety Rules, any special job or craft safety rules and the SJVNL OH&S Policy statement. Review this material so they understand it before going to work.
5. Explain the Hazardous Communication Policy and MSDS binder location. Review with the new hire to make sure they understand how to read the information when needed. Inform them of their right to know about safe handling procedures for hazardous materials that they may come in contact with or use.
6. Notice any indications of physical or mental limitations the person may have and call these to the attention of the superintendent.
7. Have the new hire fill out the safety questionnaire. The new hire will answer all questions correctly before proceeding with the orientation.
8. Issue any necessary personal protective equipment. Be certain that the equipment kept in stock is clean, in good condition, and a proper fit. Be certain the new hire knows how and when they are to use PPE.

HOD safety's Role

1. Fully explain the strong emphasis that SJVNL places on safety, the pride we have in our program, and the expectation for each of them to take an active role to make our program successful.
2. Emphasize the goal of Zero Accidents and explain Zero Tolerance Accountability.

STEP 2 - Field Interview / Orientation

HOD Safety's Role

1. Personally interview the new employee. Use the project specific picture book to assist with the following:
 - Explain the basic safety rules, and the employee's responsibilities
 - Explain the hazards that are unique to the operation
 - Explain that unsafe equipment or tools are not to be used
2. Reinforce Zero Tolerance Policy (Reprimands, Time-off, Termination)
3. Obtain a commitment from the new employee that they will actively play a role to make safety the project's top priority.
4. Make the work assignment, taking into consideration any reasonable accommodation the employee may require.
5. Have the new employee watch any additional training videos that may fit their job description (i.e. Designated Operator, Underground Safety, Defensive Driving, Fall Protection, Confined Space, etc).
6. Take them on a tour of the job and show them around. Describe the project to the new hire along with their role.



7. Explain the need to report all injuries and mark the timecard on the day an injury occurs.
8. In addition, explain that failure to report injuries may complicate a claim for Injury Compensation benefits.
9. Talk about any incentive programs that are in place and the new employee's requirements in obtaining these incentives.
10. Explain the Role of the Safety Committee.

STEP 3 - Crew/Task Introduction

Foreman's Role

1. Describe the work the crew will be doing, as well as the schedule of the overall project.
2. Introduce the new employee to all the crew members, and make them feel like they are part of the team.
3. Explain the safety rules that will specifically apply for the day. Review the Hazard Analysis for the operation, and ask the new employee for feedback to utilize any experience they might have from similar work.
4. Describe the procedures to follow in case of injury to oneself or to others. Explain whom to notify, and make sure they understand to report all accidents no matter how minor they are.
5. Describe any special evacuation procedures.
6. Show the new employee the location of all safety equipment, the crew shack, sanitary facilities, and any other areas that may play a role in their everyday activities on the job.
7. Work closely with the new employee for at least the first couple of days. Get a feel for their abilities before assigning critical tasks or allowing them to work away from experienced supervision.
8. Discuss the new employee's performance with the HOD Safety, and make changes in assignment as applicable.
9. Re-emphasize the incentive program and Safety Committee, focusing on the role that the new employee plays in each of these programs.
10. Assign an experienced crew member to work closely with the new employee for the first thirty days.

STEP 4 - Follow-up Interview

Project Manager's Role



The Project Manager will talk to the new employee within the first two weeks of their employment. They will:

1. Emphasize the importance of safety from top management.
2. Ask questions about their orientation.
3. Find out who talked to them, what they talked about, and if they really understand what their role on the job is.
4. Get a commitment from the new employee to work every day accident free and to never walk past unsafe acts.
5. Evaluate the attitude of the new employee. This is the point where the job decides whether the new employee has the attitude to continue working on the Project.

2.10.2 CONTRACTOR ORIENTATION INFORMATION

Before commencing the work, the contractor shall prepare and obtain the approval of the Site Incharge in respect of the following:

- Safety Plan detailing the safety norms that he shall evolve through a Job Safety Analysis or Hazard Identification & Risk Analysis (HIRA) and constitute a safety organization.
- Safety & Health Policy as prescribed under the BOCW Act & Rules.

Contractor is also responsible for –

- Providing constant and adequate supervision of any building or construction work under his control to ensure compliance with the legal provision / standards specified by SJVNL and as prescribed by GCC & Safety Rules for C & E. Sufficient no. of supervisors shall be appointed for this purpose by the contractor.
- Taking necessary measures to prevent accidents.
- Not to allow any worker to work in an unsafe condition or unsafe equipment.
- Providing adequate and suitable personal protective equipment, wherever they are required, to all concerned personnel. The quality of this equipment shall conform to BIS or international standards where the national standards are not available.
- A register bearing signature or thumb impression of the worker issued with issued with such PPE will be maintained as the proof of the issue and the same will be made available for verification of the EIC on demand.
- Ensuring protection of all workers from all hazards arising out of their work or due to the work carried out by other in the vicinity.
- Fulfilling necessary license / consents are obtained as required under various statutory provisions and all conditions as laid down in the said license / consent.



2.10.3 HAZARD IDENTIFICATION

Work Plans:

The approach to identifying hazards will start with detailed work operation planning (Work Plans), which will include an entire section to Operational Controls and Counter Measures. Project Policy will be that safety must be planned into all operations. Within detailed Work Plans, key safety elements of the work will be addressed and details will identify specific safety hazards.

From here, the right solution is engineered to deal with the hazard—upfront as part of the planning effort. Items that will be included in Work Plan Safety include the following: Work Plan Hazard Identification, which considers the following

- Regulatory Requirements
- Traffic Control and Public Protection
- Indian Standards in Construction Safety
- General Construction Safety Provisions
- Sanitary Requirements
- Personal Protective Equipment
- Temporary Electrical Ventilation and Lighting Needs
- Potential for Damage to Property
- Fire Prevention
- Ladders, Scaffolds
- Competent Person
- Material Storage and Handling
- Emergency Response
- First Aid and Medical
- Unique aspects of unusual portion of the work not covered by any of the above

Job Hazard Analysis

It will be SJVNL Policy to have a written and approved Job Hazard Analysis (JHA) in place for each work operation. Every operation will have a JHA prior to starting work. It is recognized by all personnel working on the Project that the JHA is a critical tool used to identify hazards and eliminate or mitigate safety risks. The JHA will ask the question “What If?” and then provide the answer.



The JHA document is originally developed in the Work Plan and is a written plan that identifies each step of a planned activity and the potential dangers associated with that step. It details the actions required to eliminate or control the hazard, and is used as a primary training tool with each crew member on a continuous basis. It will be essential that the JHA be a living document and that it be reviewed at every opportunity available including not just at the beginning of an operation, but throughout the work, and updated as the activities evolve.

Key elements of the Job Hazard Analysis will include:

1. Foreman and crew will be involved in each JHA prepared for their operations. The Foreman will be required to review and sign off on the JHA for an operation before the JHA is considered complete. At a minimum, the JHA for the crew will be reviewed once per week during a Tool Box meeting.
2. Foreman will keep JHA(s) for an operation with them (at the activity location) during the operation. The foreman will be able to produce the JHA for review any time a supervisor or crew member requests it. A binder with non-active JHA(s) will be kept in the office, and will be available for review.
3. The Head Site Safety Officer will keep a master list, of all JHA(s) showing status and latest revision date. The master list will be updated once per month.
4. The Hazard Analysis must be reviewed with any new employees that join a task already in progress before they are allowed to begin work.
5. A Hazard Analysis must be prepared for the use of high-risk activities such as the handling of hazardous products and explosives, scaling, installing rock support and the use of high risk tools, such as, air or hydraulic-operated tools, or equipment. Many other tools or small pieces of equipment should be included in this regard.
6. Crews will not begin any operation without a thorough Hazard Analysis that has been reviewed with the crew, and signed off by the Foreman. Any operation found without a current, reviewed Hazard Analysis on hand will be shut down.
7. Hazard Analysis must be reviewed and modified if necessary on a regular basis. Many times the work processes or hazards change on a repetitive operation, and if the hazard analysis is not modified to reflect these changes, they become inaccurate or obsolete. All Hazard Analyses for active operations will be reviewed at least twice per month by the job superintendents.
8. Project Management will review all Hazard Analyses for active operations at least monthly, and approve all Hazard Analysis for Major Operations
9. All projects will implement the use of the SJVNL Hazard Analysis form. Pictures should accompany Operation Hazard Analysis for all major operations
10. The “Mini”-Hazard Analysis form contained in the SJVNL Field Book will be used for amending Operation Hazard Analysis when work conditions change, and for



operations which are unexpected during the course of the work day. The “Mini” Hazard Analysis is not intended to replace the standard complete JHA.

11. Sign-off that the Hazard Analysis has been reviewed will be on Tool Box Meeting Form. Forms are typically turned in on a daily basis, and record of same is kept by the Head Site Safety Officer on a wall-chart.

2.11 SAFETY TRAINING

Formal safety training is an integral part of this Safety and Health Plan. Formal safety training is a cornerstone to maintaining a safe work site so that experienced, trained people can work safely. While informal training will be a continuous process conducted at safety meetings, operation start-ups, and with all one-on-one crew training, SJVNL will initiate several more structured, formal training programs. All training activities will be documented on a training specific sign off sheet, or in the Foreman Tool Box Meeting book. All training records will be retained in the project Safety Office.

Project-Specific Training

Project-specific training will be focused on providing the right awareness to the actual hazards that are present on the job. SJVNL management and supervisors will continually be scheduling training to address specific operational risks in advance of the work actually occurring and will use a variety of approaches to communicate the requirements of accident prevention.

Training will occur the first day on site (Employee Orientation) and continue on a daily basis (Tool Box Meetings). Specific sessions will be conducted by SJVNL management and supervision, however every opportunity will be provided to involve craft and foreman as the actual trainers of many of the forums. All training will be documented through crew sign-off and acknowledgement.

Safety Training on the Project will include the following:

| Tool | Frequency | Description |
|-------------------------|-----------|--|
| Employee Orientation | Start | Four-Step Program Involves SJVNL’s HOD safety |
| Tool Box Meetings | Daily | Held at each work location by foreman of contractor Discuss day’s activities and specific hazards |
| Foreman Safety Meetings | Weekly | Review safety performance for week Discuss safety for upcoming operations |
| Mass Safety Meetings | Monthly | Presentation of significant safety issues |



| | | |
|---------------------|----------------|---|
| | | Recognition of exemplary safety performance |
| Training Modules | Bi-Monthly | Different topic every 2 weeks – best practices Used as training tool with craft sign-off |
| Job Hazard Analysis | Each Operation | Prepared by foreman and crew Reviewed weekly and updated regularly |
| Safety Bulletins | Weekly | Prepared by Safety Office – specific issues Visible through jobsite for constant awareness |
| | | |

Training Modules:

Monthly Training Modules will focus on specific issues that are constantly present on the Rampur Hydropower Project. The Modules will consist of short, narrative, and visual reminders of the hazards that any crew may encounter on any given day. Modules are prepared by the HOD Safety and distributed to each Department head.

The Monthly Training Modules will be used as topics at tool box meetings, weekly meetings, and can be reviewed at any given time a particular hazard risk increases on site.

Monthly Training Module Topics - yearly

| MONTH | Topic 1 | Topic 2 |
|----------|-------------------------------|-------------------------------|
| Month 1 | Hand Tool Safety | Shaft Safety |
| Month 2 | Hand Safety/Pinch Points | Personal Protective Equipment |
| Month 3 | Job Access | Emergency Procedures |
| Month 4 | Equipment Daily Inspections | Crane Safety |
| Month 5 | Formwork/Shoring | Blasting Safety |
| Month 6 | Hearing Conservation | Rock Support Safety |
| Month 7 | Respiratory Protection Safety | Compressed Air Safety |
| Month 8 | Fall Protection | Welding & Cutting Safety |
| Month 9 | Hazardous Material Safety | Accident Reporting |
| Month 10 | Road Safety | Scaling Safety |
| Month 11 | Job Site Inspections | Rigging Safety |
| Month 12 | Electrical Safety | Scaffolds and ladders |

Other training Topics to be incorporated in training module:



A) Supervisors training:

- Safety systems and procedures for construction sites of both establishment and client including OHS policy and safety committee
- Responsibilities, authority and accountabilities
- Accident prevention and control
- Accident reporting systems
- Work Permit systems
- Fire prevention & control
- Personal Protective Equipment
- Construction safety
- Electrical safety
- Chemical safety
- Safety while working at height
- Occupational health and hygiene
- First aid
- Emergency preparedness plan
- Rescue and Evacuation procedure
- Evaluation by quiz, questionnaires

B) Workers training

- Safety systems and procedures of both establishment and client
- Accident prevention and control
- Work Permit systems
- Fire prevention & control
- Personal Protective Equipment
- Construction safety
- Electrical safety
- Chemical safety
- Safety while working at height
- Occupational health and hygiene
- First aid
- Emergency preparedness plan
- Rescue and Evacuation procedure

External Training programs are also provided to the employees at various prestigious institutes across the country.

2.12 SAFETY MEETINGS

As part of the overall safety training and the Project and to promote overall awareness and visibility of the Safety and Health Plan, several meetings will be conducted by SJVNL Managers, contractor's supervisors, and Foreman. Each meeting will be regularly scheduled, demand 100% attendance, and be efficient and focused to maximize the effectiveness of the time involved. An excessive trend in absence and/or tardiness, whether excused or unexcused could result in discharge.



Monthly Mass Safety Meeting

The Monthly Mass Safety Meeting will be organized by the HOD Safety and conducted by the Construction contractor. Monthly Mass Safety Meetings will be held on the first Tuesday of every month at the start of each work shift and will be mandatory for all employees and subcontractors working on the site.

Key issues to be discussed at Monthly Mass Safety Meetings will include:

- Review the past month's accidents or near misses on the job.
- Update status of incentive program and hand out and recognize excellence in performance.
- Graduate new employees from green to yellow hardhats.
- Discuss hazards of upcoming work or new direction the job is heading.
- Select a focus area for the month and use demonstrations.

Weekly Foreman's Safety Meeting

The Weekly Foreman's Safety Meeting will be organized by the Site Safety Officer of the Contractor and conducted by the Foreman. Foreman's Safety Meetings will be held every week at the start of each work shift and will be mandatory for all foreman and construction superintendents working on the site.

Key issues to be discussed at Weekly Foreman Meetings will include:

- Status of incentive programs
- Safety Committee report
- Safety Person of the Week report
- Summary of the previous week's accidents
- Choose a topic to further train our supervisors and focus on for the upcoming week.

Daily Toolbox Meeting

The Daily Tool Box Meeting will be organized by the Foreman of Contractor and will be documented by the Site Safety Officer of Contractor on a wall chart maintained at the site office. Daily Tool Box Meetings will be held at the start of each work shift and will require 100% crew attendance and be conducted in the actual work area. The Foreman's Toolbox Meeting form will be used to list items discussed. Employees will sign this form at the end of the meeting.

Key issues to be discussed at Daily Tool Box Meetings will include:

- Review and update the Job Hazard Analysis including any issues for immediate work.
- Conduct crew training using real tools and equipment.
- The crew should be actively involved in these meetings and should openly discuss any concerns they have as well as commit to working safely.

Post-Accident or Near Miss Meeting

After any serious Near-Miss, Lost Time Accident or any other serious Safety related Incident, a job-wide Mass Safety Meeting will be held to review the accident/incident. This



meeting will be held as soon as possible, no later than the start of the next day's shift. This meeting will cover all the know facts of the accident and changes that have been made to prevent a reoccurrence of the problem.

2.13 SAFETY PROGRAM/ACTIVITIES SCHEDULES

| Sr No | Daily | Weekly/ Fortnightly | Monthly | Quarterly | Other |
|-------|--------------------------------|---------------------------------------|-------------------------------|--|---|
| 1 | Safety tour | Progress meeting | Site committee meeting | Internal Site Audit | External Audit |
| 2 | Work Permit System | Reporting of HSE activity performed | Review of site hazards | Inspection of cranes and lifting accessories | Review of Site Risk |
| 3 | Tool box talk | Inspection of electrical installation | PPE inspection | Inspection of construction equipment and machinery | Special events NSD, WED, Fire services week celebration |
| 4 | Induction training | Compliance reporting | Fire extinguishers inspection | Review meeting | |
| 5 | Near Miss /First aid Recording | Inspection of First Aid center | Supervisor Training | | |
| 6 | HSE Diary | Department committee meeting | Reporting | | |
| 7 | | Training of workers | Safety promotional activities | | |

2.14 ACCIDENT INVESTIGATION AND REPORTING

Every accident, regardless of severity, will be thoroughly investigated to determine the actual causes, and to determine potential corrective actions to prevent future incidents. Every accident will be thoroughly understood as to why it occurred and lessons learned will be developed from every incident. In addition, documentation will be timely, accurate, and complete in order to mitigate against similar situations which lead to the accident causing another accident.

Accidents are briefly described of following types:



1. Near Miss Incidents:

In this type there is a loss or damage to property however no human injury is involved.

2. First Aid Injury:

In this type minor human injury is involved such as small cuts and wounds that are dressed and involve no man day loss as the injured comes back to work.

3. Accidents:

In this type human injury with man days loss is involved.

4. Dangerous Occurrence:

The following incidents are to be reported as dangerous occurrences at construction sites;

- 1) collapse or failure of lifting appliances or hoist or conveyors or other similar equipment for handling building or construction material or breakage or failure of rope, chain or loose gears, overturning of crane used in building or other construction work, falling of objects from height.
- 2) Collapse or subsidence of soil, any wall, floor, gallery, roof or any other part of any structure, platform, staging, scaffolding or any means of access including formwork.
- 3) Contact work, excavation, collapse of transmission.
- 4) Explosion of receiver or vessel used for storage at a pressure greater than atmospheric pressure of any gas or gases or liquid or solid used as building material.
- 5) Fire and explosion causing damage to any place on construction site where building workers are employed.
- 6) Spillage or leakage of hazardous substances and damages to container.
- 7) Collapse, capsizing, toppling or collision of transport equipment.
- 8) Leakage or release of harmful toxic gases at the construction site.
- 9) Accidents will be reported, investigated and recorded.

Immediately upon notification of an accident the contractor Foreman must complete the Accident Investigation Report and provide it to the SJVNL's Site Safety Officer and his own Department Head.

The Department Head and Site Safety Officer will then:

- Investigate each accident and conduct a post accident review. Determine all facts relating to the incident.
- Notify the HOD safety who in turn will notify the General Manager (Projects) as soon as practical after an accident, but no later than the time limits specified.



- Document the accident, including sketches and photographs of the scene, along with a thorough narrative describing the incident and its causes as well as the corrective actions taken to prevent reoccurrence. Send copy to HOD safety and General Manager (Projects).
- Review with project personnel at the next possible Toolbox Meeting to discuss the incident.
- Discuss the accident at the next weekly staff safety meeting.

Regarding any accidents, specific procedures will be followed, including:

- All employees must be accompanied by or treated by SJVNL Medical Personnel when seeking medical treatment.
- Failure to follow these requirements may jeopardize their rights to Workers Compensation protection.

An incident will be considered to be a recordable if it is work related and results in:

- Loss of consciousness
- Restriction of work or motion
- Transfer to a different type of work
- Requires medical treatment beyond First Aid.

The use of prescription medication to treat an injury constitutes medical treatment.

If an injured employee were taken to a clinic/hospital and found to have minor injuries that would otherwise not be recordable and the doctor could substitute an over the counter medicine, the case would not be recordable. The supervisor accompanying the injured employee would need to know the difference between medical treatment and first aid. For this reason it will be the SJVNL's policy that the Medical Officer (or designate) shall either treat directly or accompany our injured employees to any treatment facility.

The distinction between medical treatment and first aid depends on the treatment provided and the severity of the injuries. First aid is:

- Limited to one time treatment and subsequent observations; and I
- Involves treatment of only minor injuries, not emergency treatment of serious injuries.

Injuries are not minor if:

- They must be treated only by a licensed medical person.
- They impair bodily functions (i.e., normal use of limbs, eyes, etc.).



- They result in the damage to the physical structure of the body (i.e., fractures, amputation, etc.).
- They involve complications requiring follow-up medical treatment.

The following are generally considered medical treatment. Work-related injuries for which this type of treatment was provided or should have been provided are typically Recordable Injuries.

- Treatment of infection.
- Application of antiseptics during second or subsequent visits to medical persons.
- Treatment of second- or third-degree burns.
- Application of sutures.
- Removal of foreign bodies embedded in the eye.
- Removal of foreign bodies from a wound if the procedure is complicated.
- Use of prescription medication or over the counter medications at prescription strength.
- Use of hot or cold soaking therapy/compress therapy during second or subsequent visits.
- Cutting away dead skin (surgical debridement).
- Application of heat therapy during second or subsequent visits.
- Positive x-ray diagnosis (i.e., fractures, etc.).
- Admission to a hospital for treatment (or any other equivalent facility).

The following are generally considered first aid treatment (e.g., one-time treatment and subsequent observation of minor injuries) and should not be classified as a Recordable Injury.

- Application of antiseptic during first visit.
- Application of steri-strips or butterfly bandages
- Treatment of first-degree burns.
- Application of bandages during any visit.
- Application of elastic bandages during first visit to facility.
- Removal of foreign bodies not embedded in eye if only irrigation is required.
- Removal of foreign bodies from a wound; if the procedure is uncomplicated.
- Negative x-ray diagnosis.
- Observation for injury during any medical visit.
- Application of ointments to abrasions to prevent drying or cracking.



- Soaking therapy, hot or cold compresses and/or heat therapy during initial visit.

Accident Reporting:

1. Monthly reports on prescribed proforma of all accidents shall be promptly submitted to HOD Safety of the Corporation, with a copy to the General manager.
2. On the occurrences of any accident a report should be made to the HOD Safety of the Corporation with a copy to the General Manager/Head within 12 hours of the occurrence of the accident. In case of fatal accidents or those, which are so serious, that they are likely to result in the death of any workman, a report should be made immediately to the General manager/Head of the work.
3. The following sample forms (specimens attached) may be used for reporting accidents and keeping relevant statistics:

INJURY REPORT - PRELIMINARY

(To be submitted immediately after the accident) (N.B.) – Answers to all the items should be precise and definite.

No.

Date.....

1. Name of the person injured
2. Sex, Adult/Minor
3. Department/Project/Division
4. Designation
5. Regular/Work Charged/Muster Roll/Contractor’s employee
6. Date & hour of accident
7. Cause of accident
8. Fatal, serious or minor

Signature with Designation of Report Officer

To

Medical Officer

9. Nature of injury
10. Period of estimated disablement.

Signature of Medical Officer

Distribution:

1. Engineer-in-Charge
2. Safety Engineer



INJURY REPORT - DETAILED

Project _____ Date of Report _____

Section – I Injured Details:

Name of injured: Date of injury:
Occupation: Employer:
How long employed:
Salary or wage: Dates of previous Injuries:
Date of injury: Time:
Exact Place where injury Occurred:

Section – II Description of injury:

Nature & Severity of Injury.....
Did injury result in death or probable permanent disability(Yes/No):
Return to work (date).....
Date of death.....

Section – III Description of Accident:

.....
.....

Section – IV Type of Accident (Tick appropriate one)

| | |
|---|---|
| Falls of person-Same level | Falls of person-one level to another |
| Slips (causing strains; not falls) | Struck by flying, rolling, sliding object |
| Stepping in or on object | Strains or sprains-lifting |
| Struck by or cut by hand tools | Other injuries from handling objects |
| Burning or Scalding | Electric shock or flash Explosions |
| Caught in or between | Striking against object |
| Buried or partially buried by collapse of sides or fall of material | |
| Drowning or suffocation | Poisoning, Infection |
| Struck by or run over by vehicle | If other type Describe: |

Section V Causes of the Accident (To be completed by the Safety Engineer)

Tick the appropriate box in Mechanical causes; and Personal Causes. Select the cause in each sub section that could have been most readily removed to prevent the accident. In addition to marking the appropriate box, describe briefly but exactly the causes selected. Secondary or contributing causes may be indicated below:



Sub Section A Mechanical Causes

- 1. Improper guarding.....
(Unguarded, inadequately guarded, guard removed etc.)
- 2. Defective substances or equipment.....
(Broke, poorly designed, slippery, defective brakes etc.)
- 3. Hazardous arrangement.....
(Unsafely piled material, poor layout, poor housekeeping loose rock etc)
- 4. Improper Illumination.....
(Poor dusty, gassy, high humidity, excessively hot etc)
- 5. Improper dress or appeal.....
(Goggles, gloves, shoes, hardhat, respirator etc.)

No mechanical cause Insufficient data to Classify

Sub Section B (Personal Causes

- 1. Injured person other person Physical or mental defect.....
(Poor eye sight, arm amputated, deaf, epilepsy etc.)
- 2. Lack of knowledge or skill.....
(Unable to read, poor training etc)
- 3. Wrong attitude.....
(Deliberate, chance-taking disregard for instructions, etc)

No Personal causes Insufficient data to Classify

Section VI (Engineer/Supervisor Statement)

A) Name of contractor’s supervisor managing the site of accident:

.....

I have personally investigated this accident, and concur in the analysis of causes given here:

.....

Recommendation for prevention:

.....

Remarks:

Signature of Contractor Supervisor

B) Name of Contractor’s Safety Engineer/In-charge:

Date of Last Safety Inspection of the site:

Appropriate safety precautions taken at site as per Inspection check sheet (Yes/No):

Signature of Contractor Safety Engineer/In-charge



C) Name of SJVNL Site In-charge /Safety Engineer:

Date of Last Safety Inspection of the site:

Appropriate safety precautions taken at site as per Inspection check sheet (Yes/No):

Signature of SJVNL Site In-charge /Safety Engineer

Section X Corrective Action

What has been done to prevent the occurrence of similar accidents in the future?

.....
.....

This Report submitted by: (SJVNL Site In-charge /Safety Engineer)

Approved: (Construction Engineer or Superintendent)

(Note: Reporting of accident to Government Officials has to be done as per BOCW Central Rules 1998;

1. Form XIII under Rule 230 (a) – Notice of Poisoning or Occupational diseases
2. Form XIV under Rule 210 (7) – Report of Accidents and Dangerous Occurrences)

2.15 SAFETY PROMOTIONAL ACTIVITIES:

Following safety promotional activities are suggested to be carried out for enhancing safety awareness and developing safety culture.

1. **Suggestion scheme:** Any personnel reporting about any unsafe condition in written format in the suggestion box addressed to site Incharge should be awarded.
2. **Film/Video screening:** Safety related film should be screened to improve safety awareness.
3. **Exhibitions:** Exhibition of PPEs by suppliers, Fire fighting equipments should be displayed for improving safety awareness.
4. **Newsletter/Bulletin:** In-house monthly safety related bulletin should be developed in local language and distributed to workers and staff.
5. **Poster Display:** safety poster should be displayed at conspicuous locations for improving safety awareness.



6. Celebration of Special events such as National Safety Day, World Environment Day, Fire Services Day, No Tobacco Day, World Heart Day, World Aid Day and World Health Day etc.: Materials for celebration of these days are regularly developed by National Safety Council, Belapur, Navi Mumbai and can be procured with discount from it.

2.16 CONTRACTORS

On this Project, contractors will play a significant role in jobsite safety. SJVNL employees will work closely with several different contractors on a daily basis. In addition, the actual performance of SJVNL's contractors will contribute directly to the overall safety record of the Project. Fundamentally, contractor supervision and employees will be treated no differently than SJVNL personnel on the job-site when it comes to safety.

There will be no distinction in the safety requirements of Contractors on this Project. The same set of rules will be enforced for every entity on the Project. Each Contractor will be sent a clear message regarding safety at the start and enforcement to the same safety standards will be implemented from the first day to the last.

In order to accomplish, a number of items will be addressed regarding both the contractual arrangement and operational interfacing of Contractors on the Project. All of these are intended to set the same high standard of safety for everyone at the site.

Contractual Requirements

- Safety will be a factor in the selection of every Contractor on the Project.
- All public tendered contracts, the Tenderer's approach to safety and safety record will be an evaluation factor in contract award.
- Each prospective Contractor will be required to commit to the Project's Safety and Health Plan and/or provide proof that it utilizes a Plan equal to that developed for the site,
- A Safety Addendum will be included in all of our Contract Agreements that clearly defines safety rules and expectations and references the Project's Safety & Health Plan.
- SJVNL management and supervision will maintain the Zero Tolerance policy with subcontractors using verbal/written reprimands, and suspensions as necessary for non-compliance with the Project's Safety and Health Plan.

Operational Requirements

- SJVNL General Manager (Projects) will hold a pre-construction meeting with each Contractor to clearly define rules and policies.
- This meeting will be held before the Contractor is allowed to start work. The Contractor will clearly understand SJVNL's expectations and consequence for not complying.
- As required, Subcontractors will be provided assistance to develop good Work Plans and effective risk identification and Job Hazard Analysis.



Contractor Indoctrination

- All Contractor employees, regardless of tier who will work on the project will receive Indoctrination prior to starting any operations.
- All Contractor Indoctrinations will be performed by the Contractor's Safety Department with the SJVNL Head Site Safety Officer overseeing their work scope.
- All Subcontractor Indoctrinations will be signed and dated by each individual that attends the indoctrination.

2.17 FIRST AID AND MEDICAL FACILITIES AND MEDICAL EXAMINATION:

First Aid Facilities should be necessarily provided at conspicuous locations across the project site. Supervisor level person should be made responsible for issuing and maintenance of the first aid material.

The First Aiders should be trained by reputed organization such as St. John Ambulance Association and their list should be displayed at various locations along with emergency numbers.

Following items should be included in the first aid boxes;

1. Distilled water filled in eye wash bottle
2. Eye drops
3. Sterilized dressings of small, medium and large sizes along with burn dressings.
4. Sterilized cotton wool
5. antiseptic solution
6. a pair of scissors
7. adhesive tapes
8. aspirin
9. Bandages
10. Tourniquet
11. Splints
12. Safety pins
13. Snake Bite lancet
14. First aid leaflet
15. Triangular bandages
16. Sterilized latex hand gloves

Dispensary or Occupational Health Center should be maintained with all medical facilities necessary for emergency situations.

All employees and contract workmen should be medically examined before induction for their fitness to work by a competent medical officer trained in Industrial Health. The employees should also be periodically examined to ascertain their health and wellbeing and have not contracted any occupational illness and disease.



Some examinations suggested for different workers are;

| Sr. No. | Nature of work | Type of medical check up | Frequency |
|---------|-------------------|--|-----------------|
| 1 | Grit Blaster | Physical fitness, Pulmonary test, Vision test, Age Certificate | Every Six Month |
| 2 | Welder | Physical fitness, Pulmonary test, Vision test, Age Certificate | Every Six Month |
| 3 | Driller | Physical fitness, Pulmonary test, Vision test, Age Certificate | Every Six Month |
| 4 | Working at Height | Physical fitness, Pulmonary test, Vision test, Age Certificate | Every Six Month |
| 5 | Confined space | Physical fitness, Pulmonary test, Vision test, Age Certificate | Every Six Month |
| 6 | Driver / Operator | Physical fitness, Pulmonary test, Vision test, Age Certificate | Every Six Month |
| 7 | Cement handlers | Physical fitness, Pulmonary test, Vision test, Age Certificate | Every Six Month |
| 8 | Painter | Physical fitness, Pulmonary test, Vision test, Age Certificate | Every Six Month |

2.18 MONTHLY SAFETY REPORT

(To be submitted by each Contractor)

Actual Work start Date: _____ For the Month of:

Project: _____ Report No:

Name of the Contractor: _____ Status as on:

Name of work: _____ Name of Designated Safety Officer:

| ITEM | THIS MONTH | CUMULATIVE |
|--|------------|------------|
| Total Strength (Staff + Workmen) | | |
| No of Safety Meetings organised at site | | |
| No of HSE awareness programmes conducted at site | | |
| Whether Workmen Compensation Policy taken | | |
| Whether Workmen Compensation Policy is valid | | |
| Whether workmen registered under ESI Act | | |
| Number of Fatal accidents | | |
| Number of Reportable Accidents (Non Fatal) | | |
| Other accidents (Non Reportable) | | |
| Total no of Accidents | | |
| Total Man Hrs worked | | |



| | | |
|--|--|--|
| Total Man Hrs Lost due to accident | | |
| Frequency Rate | | |
| Severity Rate | | |
| Incidence Rate | | |
| No of Fire Incidents | | |
| No of First Aid Cases | | |
| No of Near Miss Incidents | | |
| Compensation Cases with Insurance Companies | | |
| Compensation Cases resolved and paid to workmen | | |
| No of Violations of Health and Safety provisions | | |
| Amount of penalties levied | | |
| Remarks, if any | | |

Date: _____

Safety Officer / Resident Engineer
(Signature and Name)

To

2.19 CONTRACTOR / SJVNL INTERFACE

SJVNL and the Contractor(s) will interface on a regular basis regarding safety. This will take place in scheduled meetings, training sessions, and at the personal interaction level. It will be mandatory that SJVNL’s HOD safety and Safety Officer and the Contractors’ Safety Managers have a good working relationship at the professional level. In addition, each of SJVNL’s Safety officer will be expected to establish this same type of working relationship with any of the Contractor’s inspection or oversight personnel present on each shift. Beyond day-to-day oversight and assisting the Contractor(s) with all related safety issues including inspections, hazard identification, investigations, and reporting SJVNL will also participate in the following tasks on this Project:

- Safety training and education
- Regular site safety inspections and audits
- Incident-related information
- Incident or accident investigation
- Technical expertise whenever required
- Review of all Contractors safety-related submittals
- Periodic QA audit of Contractors’ Safety and Health Plan(s)



2.20 SAFETY DOCUMENTATION AND RECORD KEEPING

All safety-related records will be safely kept in the Project Office in accordance with GOI standards. Only authorized personnel will have access to these records.

The following list comprises the minimum number of records that will be kept:

- Employee Accident Reports
- Accident Investigation Reports
- Jobsite Inspection Reports
- Regulatory Inspection Reports
- Safety Team of the Week Reports
- First Aid Log
- All Training Records
- All Safety Meetings and Logs



CHAPTER 3

WORK PERMIT SYSTEMS

3.1 General Rules:

- The authorized receiver must request a work permit from a certified Issuer (Site Incharge) before doing any work in a restricted area.
- The receiver of the work permit must keep the permit posted at the job location.
- The appropriate permit shall be obtained before any job is started.
- Work permits are valid for the duration mentioned therein.
- If the work is not started or is stopped due to safety considerations the permit is required to be revalidated by the issuing authority before the work is started or resumed.
- If the work is not completed during the time for which the permit was issued the person responsible for performing the work shall get it revalidated.
- Safety officer or any other responsible officer is authorized to suspend a work and withdraw the work permit if safety regulations being violated and for any of the work permit conditions are not being abide and /or conditions around work site have change which may lead to an imminently hazardous situation.
- The receiver of a work permit must keep a copy in his possession or within view of the job site for duration of the job so that it may be presented upon request.
- When the job is completed or at the end of the shift both issuer and receiver must close out each work permit.

3.2 Work Permit Formats:

Following Work Permit formats may be used in order to control the site activities of the contractors and avoid any preventable accidents.

3.2.1 Working at Height:

For carrying out activities at workplaces that are 2 or more than 2 metres this work permit is required to be issue. The Site In charge should be appointed as responsible person for issue and enforcing this system.



Format of Work Permit

APPLICATION FOR ISSUE OF HEIGHT PASS

(Valid only for 6 months from issue date, unless cancelled/ withdrawn earlier by the issuing authority. It can be revalidated free of cost on due application to Safety officer of SJVNL. In Case of loss, applicant must apply and appear for the practical test again)

1. Full Name of Applicant:
2. Present Address
3. Permanent Address
4. Age and Sex.
5. Height and Weight
6. Gate Pass No and Date
7. Name of Contractor with whom engaged at present:
8. Contract Work Order No
9. Description of Present job
10. Previous experience of working at Height

Declaration

I hereby declare that the above-mentioned information furnished by me is true and correct. I shall always wear the safety belt and tie the life line whenever working at height above 2 metres or in depth. I shall not misuse the pass issued to me or transfer it to any other person. I shall never come to duty under the influence of alcohol.

Date:

Sign of Site Engineer
(Contractor)

Sign of Safety Officer
Concerned Contractor

Name of Applicant
Sign of Concerned employee

Sign of Site In charge Engineer

MEDICAL EXAMINATION (PART I)

Date of Medical Test:

- a) Blood Pressure
- b) Epilepsy
- c) Flat foot
- d) Mental Depression
- e) Frequent Headache
- f) Others

I Dr.....have examined

Mr./Ms..... have found him/her not suffering from any height related illness.

I certify that he/she is **fit to work at height.**



Sign of Doctor with Reg. No. and seal

PHYSICAL TEST (PART II)

Date of Physical test:

Test:

- 1. Walking freely on bar at 3 metres height pass/ not pass
- 2. Walking on bar at 3 metres height wearing safety belts pass/ not pass
- 3. Walking freely on horizontal structure at 3 metres height pass/not pass
- 4. General physique

Name of applicant:

The above applicant has performance in the above test is satisfactory / not satisfactory.

He has been issue a height pass bearing Sr. No.

Date of Issue:

Sign of Contractor Safety Officer

Sign of Issuing authority
Name & Designation:

PASS TO WORK AT HEIGHT

- 1. Date:
- 2. Name:
- 3. Gate Pass No.
- 4. Age
- 5. Trade
- 6. Contractor/ subcontractor:

Safety training given for safe working at and use of PPEs (Helmet, Safety Belt and Fall arrestor) and safety net and working platform.

UNDERTAKING

Ihave understood safety precautions to be taken while working at Height. If the above conditions are not fulfilled I would be alone responsible for violation of safety norms and penalty if any.

Signature

Authorized to work at Height Validity date:



Sign of Site In charge

Sign of Contractor Safety Officer

3.2.2 HOT WORK PERMIT

(Hot work would mainly comprise – Welding, gas cutting, use of open flame or open flames or other sources of fire in a fire prone place containing inflammable substances, explosives &/or other such highly combustible material susceptible to spontaneous ignition &/or explosion.)

A) the person taking permit to fill up:

1. Exact location where hot work is being planned.
2. Approximate duration of work. From Date:Time:
To Date:Time:

Points to be checked

| Sr. No. | Details | Remarks | | |
|---------|--|---------|----|--------------|
| | | Yes | No | Not Required |
| 1 | The area immediately below the work spot been cleared/removed of oil, grease and cotton waste etc | | | |
| 2 | Gas concentration been tested in case there is gas valve / gas line nearby | | | |
| 3 | Fire extinguishers are kept handy at site | | | |
| 4 | Tin sheet / wet gunny bag / fire retardant cloth/sheet been placed to prevent sparks from causing fire | | | |
| 5 | Water hose connection been made for continuous water spray | | | |
| 6 | All the drain inlets (if any) been closed | | | |
| 7 | Any other precaution taken (specify) | | | |

The above points have been complied with and conditions rendered safe / hazards innocuous to undertake the hot work.

Name of Permittee: Signature: Designation:
(Site Incharge)

Date & time:

B) The person giving permit (issuing authority) to fill up:

After checking all the precautions the hot work can be carried out in the above area.

Name & Signature of Issuing authority:
Section Incharge Safety Officer

C) Time: Date: at which the permit closed and filed



Name & Signature of safety Officer:

3.2.3 CONFINED SPACE ENTRY PERMIT

(To identify safe work practices related to working inside a confined space or a vessel or a plant / equipment)

10.2 The person-taking permit (Permittee) to fill up.

- 1. Identity of the Confined Space
2. Location
1. Purpose of Entry
2. Date
3. Validity of confined space
Permit From Date: Time:
To Date: Time:
4. Has the Vessel / Equipment / Space been cleaned, purged, Isolated:
5. Have all the electrical / air / hydraulic equipment / drives been disconnected:
6. Have the persons required to enter the confined space been trained in dealing with the specified hazards:
7. PPE provided:
8. Has a rescue team equipped with emergency rescue devices put on standby:
9. Has 24 V hand lamp been provided:
10. Exhaust / fresh air flow fan been provided:
11. Test Required:
a) Oxygen level (19.5 % – 23.5 %)
b) Explosibility (0%)
c) Carbon monoxide level (50 ppm max)
d) Carbon dioxide level (1200 ppm max)
e) Methane (below permissible level)
f) Temperature
g) Air flow
h) Others
12. List of authorised persons to work inside a confined space & the rescue team (List to be enclosed)

I have checked the above points and found conditions suitable to undertake the work.

Name of Permittee: Signature: Designation:
(Site Incharge)

B) The person giving permit (issuing authority) to fill up:
The precautions and safe conditions mentioned above have been verified and the work can be started.

Name & Signature of Issuing authority:
Section Incharge Safety Officer



A) Time: Date: at which the permit closed and filed

Name & Signature of Safety Officer:

3.2.4 SAFETY WORK PERMIT FOR EXCAVATION, TRENCHING AND EARTH REMOVAL

PART I

1. Initiating Agency
2. Name of the Contractor
3. Location of Excavation
(Sketch given overleaf)
4. Description of work and purpose
5. Road cutting involved / traffic affected
(If Yes Fire / Security Officer to be informed)
6. Probable date of commencement and duration of work

.....
Initiator
Date:

.....
Site Incharge

PART II

1. Under ground electrical cables involved
2. Under ground telephone cables involved
3. Underground water line (Domestic / Fire involved)

Further precautions suggested:

| | | | |
|---------------------|----------------------|--------------------|------------------|
| For Electric Cables | For Telephone Cables | For water line etc | For Fire Section |
|---------------------|----------------------|--------------------|------------------|

| | | | |
|-------|-------|-------|-------|
| | | | |
|-------|-------|-------|-------|

| | | | |
|--------------------------------|----------------------------|-----------------------|--------------|
| Electric Power Supply Engineer | Telecommunication Engineer | Water supply Engineer | Fire Officer |
|--------------------------------|----------------------------|-----------------------|--------------|

PART III

I have satisfied the permit conditions and recommend the permit for release.

Name & Sign of Initiating Authority:

PART IV

Details furnished on Part I to Part III are satisfactory. Permit may be release.

Name & Sign of safety Incharge

PART V

10.2.2 After completion of work I have visited the site of excavation and found normalized. This permit is sent to safety department.



Name & Sign of Dept Incharge:

10.2.3 Inspected the site and found satisfactory:

Name & Sign of Site Incharge:

3.2.5 ELECTRICAL ISOLATION PERMIT

| | | | | |
|------------------|--|--|-----------|-------------------------|
| APPLICANT PERMIT | Permit Applicant: (Department / Section / Contractors): | | | |
| | To electrically isolate the following: | | | |
| | To perform the following work: | | | |
| | Controls checked and actioned to prevent undesirable operation of the equipment | Yes | No | Related Work Permit No. |
| | Duration of work | Date & Time: | From | |
| | Name of Applicant | Gate Pass No | Signature | Date |
| | | | | |
| COMPETENT PERSON | (A) Authorization (electrical Isolation): Electrical isolation carried out by Electrical Competent person. Electrical Isolation for the above equipment has been completed and that the points isolated are Yes No Remarks | | | |
| | Switch off Main Isolator switch | | | |
| | Remove power fuses | | | |
| | Remove all control supply fuses including motor space heater supply fuses | | | |
| | Rack out starter module / circuit breaker | | | |
| | Display / put electrical lockout tag duly filled | | | |
| | Any other special action taken / Precaution to be taken: | | | |
| | WARNING: ALL OTHER ELECTRICAL EQUIPMENTS ARE DANGEROUS | | | |
| | Declaration: I certify that the above-mentioned equipment has been electrically isolated and it is safe to work in / upon in accordance with the rules. | | | |
| | PERMIT APPLICANT | B) Acceptance: Performing supervisor sign for ensuring job site supervision, acceptance of safe isolation requirements and precaution needed for safe work. | | |
| Name | | Gate Pass No | Sign | Date |
| | | | | |



| | | | | |
|------------------|--|--------------|------|------|
| | C) Completion / cancellation: (This permit may be cancelled) I hereby declare that all men under my charge have been withdrawn and warned that it is no longer safe to work in / upon the above mentioned location / equipment. All tools / gear I brought in matter have been removed and the site has been cleared from all objects that might cause any potential hazards of fire. All removed covers have been replaced leaving the equipment ready for commissioning. | | | |
| | Name | Gate Pass No | Sign | Date |
| COMPETENT PERSON | (C1) Step 1: I have satisfied myself that location / equipment covered by this permit are safe for re-commissioning and that the supply can be restored. | | | |
| | Name | Gate Pass No | Sign | Date |
| | (C2) Step 2: Electrical supply to the equipment has been restored by reversal of above isolation from the new sub station and warning tags removed. | | | |
| | Name | Gate Pass No | Sign | Date |
| | (C3) Step 3: The equipment is now re-commissioned satisfactorily and this permit is cancelled. | | | |
| | Name | Gate Pass No | Sign | Date |

3.2.6 PERMIT TO WORK ON PLANT, MACHINERY & OTHER POWER DRIVEN EQUIPMENT

1. Nature of the equipment
2. Area / Location
3. Clearance required for
4. Nature of the job to be done

| | | |
|------------------|---------------|--------------|
| | Requested by: | Approved by: |
| Name & Signature | | |
| Designation | | |
| Date & time | | |

5. Equipment de energized at (Time) (Date)
6. Fuses removed Yes / No
7. Circuit Breaker Lowered / Removed Yes / No
8. Danger tag Provided Yes / No
9. Earthing Lead No provided Yes / No

Authorised Signature:
Name
Designation
Date & Time

10. Equipment Energized at (Time) (Date)



11. Earthing Lead No. Provided Yes / No

Authorised Signature:
Name
Designation
Date & Time

3.2.7 BLASTING WORK PERMIT

Site: Job Number:
Date: Serial number of blasting:
Name of the approved **Blaster** / Shot Firer:
Name of the Sub contractor:
No of workmen involved in the drilling & Blasting Operation:
Area / Level of Blasting:
Starting Time of drilling Operation:

Please permit the following Blasting job as per sketches enclosed:
.....
Details of Blasting Length: M Width : M Depth: M
Permit Valid from (Date):

| Sr. No. | Safety Precautions | Yes / No |
|---------|--|----------|
| 1 | All the drillers have been provided with Ear Plugs, Helmet, goggles & Gumboot / safety shoes | |
| 2 | Hole spots to be drilled are properly inspected by competent person Depth & No of holes to be drilled | |
| 3 | Sockets in the blasted area are flushed with air & water | |
| 4 | Bore holes are cleared of all debris before explosive are inserted | |
| 5 | Mention a) No of cartridges brought from magazine b) No of cartridges loaded | |
| 6 | All the excessive cartridges are removed from work spot | |
| 7 | The circuit has been checked. Specify the resistance | |
| 8 | The clearance has been given by all the working gang within the safety zone | |
| 9 | No of person involved in the operation have been counted for coming out from the spot after loading | |
| 10 | Danger zone is suitably cordoned and flagman posted at important points | |
| 11 | Sufficient warning is given to public on siren before firing. (Not less than 1 Minute) Specify Mode of signal | |
| 12 | Whether the environmental condition considered (Rain / sunny / Wind / Thunders /Ligthning) | |



| | | |
|----|--|--|
| 13 | Any electrical / telecom lines or cables are near by Specify the distance and voltage | |
| 14 | Mobile phones and pagers prohibited in the location | |
| 15 | Specify Approved Blasting time and date | |

Date: Execution Dept: Name & Signature:
Designation:

Remarks if any:

The above mentioned job can commence:

Date: Safety dept: Name & Signature:
Designation:

The above-mentioned Blasting job has been completed satisfactorily and the Blasting area is closed and returned to normal service.

Date: Issuing Authority (SVNL)
Name & Signature:
Designation:



Annexure 1

DEFINITIONS AND GLOSSARY OF TERMS

(The Definitions given here under are pertains to this document only)

1. Access or Egress means passageways, corridors, stairs, platforms, ladders and any other means to be used by a construction worker for normally entering or leaving the workplace or for escaping in case of danger.
2. Accident means an unintended occurrence arising out of and in the course of employment of a person resulting in injury.
3. Adolescent means a person who has completed his fifteen years of age but has not completed his eighteenth year.
4. Adult means a person who has completed his eighteenth years of age.
5. Base plate means a plate for distributing the load from a standard in the case of metal scaffolds.
6. Bay in relation to scaffolds, means that portion of the scaffold between horizontal or vertical supports whether standards or supports from which the portion is suspended, which are adjacent longitudinally.
7. Brace means a member incorporated diagonally in a scaffold for stability.
8. Bulkhead means an airtight structure separating the working chamber from free air or from another chamber under a lower pressure than the working pressure.
9. Caisson means an air and watertight chamber in which it is possible for men to work under air pressure greater than atmospheric pressure at sea level to excavate material below water level.
10. Cofferdam means a structure constructed entirely or in part below water level or below the level of the water table in the ground and intended to provide a place for work that is free of water.
11. Competent Person means a person so approved by the Central Government, who belongs to a testing establishment in India, possessing adequate qualification, experience and skill for the purpose to testing, examination or annealing and certification of lifting appliances, lifting gear, wire ropes or pressure plant or equipment.
12. Compressed air means air mechanically raised to a pressure higher than atmospheric pressure at sea level.
13. Construction site means any site at which any of the processes or operations related to construction work are carried on.



14. Conveyor means a mechanical device used in construction work for transport of construction material, articles, or packages or solid bulk from one point to another point.
15. Danger means danger of accident or of injury or to health.
16. Dangerous Occurrence means an intended occurrence arising out of failure of structures, heavy equipment resulting in serious destruction in the site whether causing any bodily injury or disability or not.
17. Death means fatality resulting from an accident.
18. Decanting means the rapid decompression of person in a man-lock to atmospheric pressure at sea level followed promptly by their recompression in a decant lock, where they are then decompressed according to the appropriate decompression table in accordance with approved decompression procedures.
19. Demolition work means the work incidental to or connected with the total or partial dismantling or razing of a building or a structure other than a building and includes the removing or dismantling of machines or other equipment.
20. Disabling Injury means an injury causing disablement extending beyond the day of shift on which the accident occurred.
21. Detonator means a small tube of aluminum or copper or other materials approved by Chief Controller of Explosives.
22. Explosive means any substance whether a single chemical compound or a mixture of substances, whether solid or liquid or gaseous, as approved by the Chief Controller of Explosives, used with a view to produce a practical effect by explosion or pyrotechnic effect.
23. Excavation means the removal of earth, rock or other material in connection or demolition work.
24. False works means the structural supports and bracing for formworks or forms.
25. Flashpoint means the minimum liquid temperature at which a spark or flame causes an instantaneous flash in the vapour space above the liquid.
26. Frame or modular scaffold means a scaffold manufactured in such a way that the geometry of the scaffold is pre-determined and the relative spacing of the principal members are fixed.
27. Guardrail means a horizontal rail secured to uprights and erected along the exposed sides of scaffolds, floor openings, runways and gangways to prevent persons from falling.
28. Hazard means danger or potential danger.
29. Hazardous substance means any substance which due to its explosiveness, inflammability, radio-activity, toxic or corrosive properties, or other similar characteristics, may cause injury; or affect adversely the human system, or cause loss of life or damage to property on work-environment, while handling, transporting or storing.



30. High-pressure air means air used to supply power to pneumatic tools and devices.
31. Independent tied scaffold means a scaffold, the working platform 01 which is supported from the base by two or more rows of standards and which apart from the necessary ties stands completely free the building.
32. Ledger means a member spanning horizontally and tying scaffolding longitudinally and which acts as a support for putlogs or transoms.
33. Lifting appliance means a crane, hoist, derrick, winch, gin pole, sheer legs, jack, pulley block or other equipment used for lifting materials, objects or, building worker.
34. Lifting gear means ropes, chains, hooks, slings and other accessories of a lifting appliance.
35. Lock attendant means the person on charge of a man-Lock or medical lock recompression or decompression of persons in such locks.
36. Low pressure air means air supplied to pressurize working chambers and man-Locks and medical locks.
37. Magazine means a place in which explosives are stored or kept, whether above or below ground, as approved by the Chief Controller of Explosives.
38. Man-Lock means any lock, other than a medical lock, used for the compression or decompression of persons entering or leaving a working chamber.
39. Material hoist means a power to manually operated and suspended platform or bucket operating in guide rails and used for raising or lowering material exclusively and operated & controlled from a point outside the conveyance.
40. Materials lock means a chamber through which materials and equipments pass from one air pressure environment into another.
41. Medical lock means a double compartment lock used for the therapeutic recompression and decompression of persons suffering from the ill effects of decompression.
42. National standards mean standards as approved by Bureau of Indian Standards and in the absence of such standards of Bureau of Indian Standards, the standards approved by the Central Government for a specific purpose.
43. Outrigger means a structure projecting beyond the facade of a building with the inner end being anchored and includes a cantilever or other support.
44. Plant or equipment includes any plant, equipment, gear, machinery, apparatus or appliance, or any part thereof.
45. Pressure means air pressure in bars above atmospheric pressure.
46. Pressure plant means the pressure vessel along with its piping and other fittings operated at a pressure greater than the atmospheric pressure.
47. Putlog means a horizontal member on which the board, plank or decking of a working platform are laid.



48. Reportable accident/injury means any injury causing death or disablement to an extent as prescribed by the relevant statute.
49. Responsible person means a person appointed by the employer to be responsible for the performance of specific duty or duties and who has sufficient knowledge and experience and the requisite authority for the proper performance of such duty or duties.
50. Reveal tie means the assembly of a tie tube and a fitting used for tightening a tube between two opposite surfaces.
51. Right angle coupler means a coupler, other than a swivel or putlog coupler, used for connecting tubes at right angles.
52. Rock bolt means a mechanical expansion bolt used with cementitious or resin-anchoring system, which is set in drilled hole in the arch or wall of a tunnel to improve rock competency.
53. Roofing bracket mean a bracket used in sloped roof construction and having sharp points or other means for fastening to prevent slipping.
54. Safety cartridge means a cartridge for small arms having diameter not exceeding 2.5 cms the case of which can be extracted for the small arms after firing and which is so closed as to prevent any explosion in one cartridge being communicated to other cartridges.
55. Safety fuse means a fuse for igniting charges of other explosives which burn and does not explode and which does not contain its own means of ignition.
56. Safety screen means an air and water tight diaphragm placed across the upper part of a compressed air tunnel between the face and bulkhead, in order to prevent flooding the crown of the tunnel between the safety screen and the bulkhead to provide a safe means of refuge and exit from a flooding or flooded tunnel.
57. Safe working load in relation to an article or lifting gear or lifting appliance, means the load, which is the maximum load that may be imposed on such article or appliance with safety in the normal working conditions as assessed and certified by a competent person.
58. Scaffold means any temporarily provided structure on or from which construction workers perform their and any temporarily provided structure which enables workers to obtain access to or which enable materials to be taken to any place at which such work is performed, and includes any working platform, gangway, runway, ladder or step- ladder (other than a ladder or step-ladder which does not form part of such structure) together with any guardrail, toe board or other safeguards and all fixings, but does not include lifting appliance or a lifting machine or to support other plant or equipment.
59. Segment includes a cast iron or precast concrete segmented structure formed to the curvature of the tunnel cross-section and used to support the ground surrounding the tunnel.
60. Service shaft means a shaft for the passage of workers or materials to or from a tunnel under construction.



61. Shaft means an excavation having a longitudinal axis with an angle greater than forty five degree from the horizontal for the passage of workers or materials to or from a tunnel, or leading to an existing tunnel.
62. Shield means a movable frame, which supports the working face or a tunnel and the ground immediately behind it and include equipment designed to excavate and support the excavated areas in tunnel.
63. Sole Plate means member used to distribute the load from the base plate or the standard of wooden scaffolds to the supporting surface.
64. Sound or good construction means construction conforming to the relevant national standards or in case such national standards do not exist, to other generally accepted international engineering standards or code of practices.
65. Standard means a member used as a vertical support or column in the construction of scaffolds which transmits a load to the ground or to the solid construction.
66. Standard safe operating practices means the practice followed in construction activities for the safety and health of workers and safe operation of machineries and equipment used in such activities and such practices conforms to all or any of the following, namely:-
 - i. relevant standards approved by Bureau of Indian Standards;
 - ii. national building code;
 - iii. manufacturer's instruction on safe use of equipment and machinery
 - iv. Code of practice on safety and health in construction industry published by International Labour Organization and amended from time to time.
67. Steel rib includes all steel beams and other structural members shaped to conform to the requirements of a particular tunnel cross section, used for the purpose of supporting and stabilizing the excavated areas.
68. Suspended scaffold means a scaffold suspended by means of ropes or chains and capable of being raised or lowered but does not include a boatswain's chair or similar appliance.
69. Testing establishment means a establishment with testing and examination facilities, as approved by the Central Government for carrying out testing, examination, annealing or similar other test or certification of lifting appliances or lifting gear or wire rope as required under these rules.
70. Tie means an assembly used to connect a scaffold to a rigid anchorage.
71. Toe board means a member fastened above a working platform, access landing, access way, wheel barrow run, ramp or other platform to prevent building workers and materials falling there from.
72. Transom means a member placed horizontally and used to tie transversely one ledger to another, or one standard to another in an independent tile scaffold.
73. Trestle scaffold includes a scaffold in which the supports for the platform are any of the following which are self-supporting, namely: -



- i. Split heads,
 - ii. Folding,
 - iii. Step-Ladder,
 - iv. Tripods, or
 - v. Movable contrivances similar to any of the foregoing.
74. Tubular scaffold means a scaffold constructed from tubes and couplers.
75. Tunnel means a subterranean passage made by excavated beneath the over-burden into which a construction worker enters or is required to enter to work.
76. Underground means any space within the confines of a shaft, tunnel, caisson or cofferdam.
77. Vehicle means a vehicle propelled or driven by mechanical or electrical power and includes a trailer, traction engine, tractor, and road- building machine and transport equipment.
78. Working chamber means the part of construction site where work in a compressed air environment is carried out, but does not include a man-Lock or medical lock.
79. Working platform means a platform, which is used to support building workers or materials and includes a working stage.
80. Working pressure means pressure in a working chamber to which a worker is exposed. Certification of lifting appliances or lifting gear or wire rope as required under these rules.
81. Workplace means all places where construction workers are required to be present or to go for work and which are under the control of an employer.

* * *



Annexure 2

Some Important Indian Standards on Safety

| Sr. No. | IS Code | Description |
|---------|--------------------------|---|
| 1 | IS : 3764 | Safety code for excavation work |
| 2 | IS : 4014 | Code of practice for steel tubular scaffoldings |
| 3 | IS : 4081 | Safety code for blasting & related drilling operations |
| 4 | IS : 4130 | Safety code for demolition of buildings |
| 5 | IS : 4138 | Safety code for working in compressed air |
| 6 | IS : 4756 | Safety code for tunneling work |
| 7 | IS : 4912 | Safety requirements for floor and wall openings, railing and toe boards |
| 8 | IS : 3696 | Code of safety for ladders & scaffoldings |
| 9 | IS : 5878 (Part-2/Sec-1) | Precautions for blasting in tunnels & shafts |
| 10 | IS : 5878 (Part-2/Sec-2) | Ventilation, lighting, mucking & dewatering in tunnels |
| 11 | IS : 807 | Code of practice for design, manufacturing, erection & testing of cranes and hoists |
| 12 | IS : 5121 | Safety code for piling and other deep foundations |
| 13 | IS : 5916 | Safety code for constructions involving use of hot bituminous materials |
| 14 | IS : 7205 | Safety code of erection on structural steel work |
| 15 | IS : 7293 | Safety code for working with construction machinery |
| 16 | IS : 7969 | Safety code for handling and storage of building materials |
| 17 | IS : 8989 | Safety code for erection of concrete framed structures |
| 18 | IS : 8964 | Recommendations for safety conditions for wood working machines - Part 1 to 24 |
| 19 | SP 53 | Safety code for the use, care and protection of hand operated hand tools |
| 20 | IS : 13367 | Code of practice - Safe use of cranes |
| 21 | IS : 9474 | Principles of mechanical guarding of machinery |
| 22 | IS : 8324 | Code of practice for safe use and maintenance of non calibrated round steel lifting chains & slings |
| 23 | IS : 2825 | Code for unfired pressure vessels |
| 24 | IS : 8216 | Lift wire ropes, guide for inspection |
| 25 | IS : 9944 | Recommendations on safe working loads for natural and man-made fiber rope slings. |
| 26 | IS : 10291 | Safety code for dress divers in civil engineering works |
| 27 | IS : 10386 | Safety code for construction, operation and maintenance of river |



| Sr. No. | IS Code | Description |
|---------|--------------------------|---|
| | (part-I to X) | valley projects |
| 28 | IS : 3629 | Specifications for structural timber in buildings |
| 29 | IS : 3337 | Specifications for ballies |
| 30 | IS : 13416 (part-I to V) | Recommendations for falling material, hazard prevention, fall preventions, disposal of debris, timber structures, fire protection |
| 31 | IS : 8523 | Specifications for respirators, canister type gas masks |
| 32 | IS : 1991 | Safety code for the use, care and protection of abrasive wheels |
| 33 | IS : 2148 | Flameproof enclosures of electrical apparatus |
| 34 | IS : 4051 | Code of practice for installation and maintenance of electrical equipment in mines |
| 35 | IS : 4357 | Methods for stability testing of forklift trucks |
| 36 | IS : 5571 | Guide for selection of electrical equipment for hazardous areas |
| 37 | IS : 6539 | Intrinsically safe magnet telephones for use in hazardous atmospheres |
| 38 | IS : 8091 | Code of safe practice for industrial plant layout |
| 39 | IS : 8235 | Guide for safety procedures in hand operated hand tools |
| 40 | IS : 8241 | Methods of marking for identifying electrical equipment for explosive atmospheres |
| 41 | IS : 8945 | Electrical measuring instruments for explosive gas atmospheres |
| 42 | IS : 11016 | General and safety requirements for machine tools and their operation |
| 43 | IS : 11057 | Industrial Safety Nets |
| 44 | IS : 11461 | Code of practice for compressors safety |
| 45 | IS : 2309 | Code of practice for the protection of buildings and allied structures against lightning |
| 46 | IS : 3043 | Code of practice for earthing |
| 47 | IS : 5216 | Recommendations on safety procedures and practices in electrical works |
| 48 | IS : 7689 | Guide for control of undesired static electricity |
| 49 | IS : 8923 | Warning symbol for dangerous voltages |
| 50 | IS : 11005 | Dust-tight ignition proof enclosures of electrical equipment |
| 51 | IS : 6305 | Safety code for powered industrial trucks |
| 52 | IS : 11006 | Flash back arrestor (flame arrestor) |
| 53 | IS : 10312 | Safety code for powered tow trucks |
| 54 | IS : 10311 | General requirements for powered platform trucks and their acceptance criteria |
| 55 | IS : 7361 | Stability tests for pallets stackers and high lift platform trucks (pedestrian and rider controlled) |
| 56 | IS : 1260 (part-I) | Pictorial markings for handling and labeling of dangerous goods |
| 57 | IS : 1446 | Classification of dangerous goods |
| 58 | IS : 5931 | Handling cryogenic liquids |
| 59 | IS : 4607 | Classification of hazardous chemicals and chemical products |



| Sr. No. | IS Code | Description |
|---------|------------|---|
| 60 | IS : 4015 | Guide for handling cases of pesticide poisoning |
| 61 | IS : 4155 | Glossary of terms relating to chemical and radiation hazards and hazardous chemicals |
| 62 | IS : 9964 | Recommendations for maintenance and operation of petroleum storage tanks |
| 63 | IS : 875 | Structural safety of building: Loading standards (part 1-5) |
| 64 | IS : 13415 | Code of safety for protective barriers in and around building |
| 65 | IS : 1905 | Structural safety of buildings: Masonry walls |
| 66 | IS : 1646 | Code of practice for fire safety of buildings (general): Electrical installations |
| 67 | IS : 933 | Portable chemical fire extinguishers, soda acid type |
| 68 | IS : 940 | Portable chemical fire extinguisher, water type (gas pressure) |
| 69 | IS : 2171 | Portable fire extinguishers, DCP (cartridge type) |
| 70 | IS : 2190 | Code of practice for selection, installations and maintenance of portable first-aid fire extinguisher |
| 71 | IS : 2878 | Portable fire extinguishers, carbon dioxide type |
| 72 | IS : 5490 | Refills for portable fire extinguishers and chemical fire engines |
| 73 | IS : 10204 | Portable fire extinguisher, mechanical foam type |
| 74 | IS : 11108 | Portable fire extinguishers, Halon 1211 type |
| 75 | IS : 2189 | Code of practice for selection, installation and maintenance of automatic fire detection and alarm system |
| 76 | IS : 1641 | Code of practice for fire safety of buildings: General principles and fire grading and classification |
| 77 | IS : 1644 | Code of practice for fire safety of buildings: personal hazard |
| 78 | IS : 2190 | Code of practice for selection, installation and maintenance of first aid fire appliances |
| 79 | IS : 3016 | Code of practice for fire precautions in welding and cutting operations |
| 80 | IS : 3034 | Code of practice for fire safety in industrial buildings: Electrical generating and distributing stations |
| 81 | IS : 5896 | Code of practice for selection, operation and maintenance of fire fighting appliances |
| 82 | IS : 3594 | Code of practice for fire safety of industrial building: General storage and warehousing |
| 83 | IS : 9668 | Code of practice for provision and maintenance of water supplies for fire fighting |
| 84 | IS : 818 | Code of practice for safety and health requirements in electric and gas welding and cutting operations |
| 85 | IS : 8433 | Dissolved acetylene cylinders |
| 86 | IS : 3521 | Industrial safety belts and harness |
| 87 | IS : 4501 | Aprons, rubberized, acid and alkali resistant |
| 88 | IS : 6153 | Protective leather clothing |
| 89 | IS : 8095 | Accident prevention tags |
| 90 | IS : 8519 | Guide for selection of industrial safety equipment for body |



| Sr. No. | IS Code | Description |
|---------|------------|--|
| | | protection |
| 91 | IS : 10667 | Guide for selection of industrial safety equipment for protection of foot and leg |
| 92 | IS : 8520 | Guide for selection of industrial safety equipment for eye, face and ear protection |
| 93 | IS : 3483 | Noise reduction in industrial buildings |
| 94 | IS : 7194 | Noise exposure during work for hearing conservation purposes, assessment |
| 95 | IS : 5182 | Air pollution, methods of measurement (Part 1 to 20) |
| 96 | IS : 10224 | Ergonomic principles in the design of work systems |
| 97 | IS : 9457 | Code of practice for safety colours and safety signs |
| 98 | IS : 8520 | Guide for selection of industrial safety equipment for eye, face and ear protection |
| 99 | IS : 9167 | Ear protectors |
| 100 | IS : 1179 | Equipment for eye and face protection during welding |
| 101 | IS : 5983 | Eye-protectors |
| 102 | IS : 8521 | Industrial safety faceshields: part 1 with plastic visor |
| 103 | IS : 8940 | Code of practice for maintenance and care of industrial safety equipment for eye and face protection |
| 104 | IS : 10592 | Industrial emergency showers, eye and face fountains and combination units |
| 105 | IS : 1989 | Leather safety boots and shoes; part-I for miners & part-II for heavy metal industries |
| 106 | IS : 5557 | Industrial and safety Rubber knee boots |
| 107 | IS : 3976 | Safety rubber-canvas boots for miners |
| 108 | IS : 10665 | Safety rubber ankle boots for miners |
| 109 | IS : 2573 | Leather gauntlets and mittens |
| 110 | IS : 4770 | Rubber gloves for electrical purposes |
| 111 | IS : 6994 | Industrial safety gloves: part-I leather and cotton gloves |
| 112 | IS : 8807 | Guide for selection of industrial safety equipment for protection of arms and hands |
| 113 | IS : 2925 | Industrial Safety helmets |
| 114 | IS : 4151 | Protective helmets for scooter and motorcycle riders |
| 115 | IS : 5679 | Miner's cap lamps assemblies (incorporating lead-acid batteries) |
| 116 | IS : 8522 | Respirators, chemical cartridge |
| 117 | IS : 8533 | Respirators, canister type (gas masks) |
| 118 | IS : 9473 | Filter type particulate matter respirators |
| 119 | IS : 9563 | Carbon monoxide filter self-rescuers |
| 120 | IS : 9623 | Recommendations for the selection, use and maintenance of respiratory protective devices |
| 121 | IS : 9937 | Portable methanometer (electrical type) |



| Sr. No. | IS Code | Description |
|----------------|----------------|---|
| 122 | IS : 10245 | Breathing apparatus: Part-1, closed-circuit breathing apparatus (compressed oxygen cylinder), Part-2, Open circuit breathing apparatus, Part-3, Fresh air hose and compressed air line breathing apparatus, Part-4, Escape breathing apparatus (short duration self contained type) |
| 123 | IS : 5424 | Rubber mats for electrical purposes |
| 124 | IS : 6685 | Life jackets |

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