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COMPENDIUM OF INDIAN STANDARDS

SAFETY IN CONSTRUCTION OPERATION AND MAINTENANCE OF RIVER VALLEY PROGECTS

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BUREAU OF INDIAN STANDARDS

Compendium of Standards for Safety in Construction, Operation, and Maintenance of River Valley Projects

Introduction

This compendium presents a structured collection of Indian Standards related to safety in the construction, operation, and maintenance of river valley projects. These projects—encompassing dams, canals, tunnels, hydropower plants, and allied infrastructure—play a vital role in irrigation, flood control, power generation, and water supply. Given their complexity and scale, adherence to established safety practices is critical.
The standards compiled herein address a broad spectrum of safety aspects including general safety management, hazard identification, protective equipment, electrical safety, fire protection, and safe handling of explosives and chemicals.

1. IS 4410 (Part 13) : 1985 - Glossary of terms relating to river valley projects: Part 13 Operation, Maintenance and Repair of River Valley Projects

This standard covers the definitions of terms relating to operation, maintenance and repair of river valley projects. Terminology is derived from standard definitions critical to ensuring clarity in safety protocols. It aims to establish common language across all stakeholders and reduces miscommunication.

2. IS 10386 (Part 1) : 2013 - Safety code for construction, operation and maintenance of river valley projects: Part 1 general aspects (First Revision)

This standard lays down the requirements regarding safety programme, its enforcement, general qualifications of employees and training for safety and contractor's/employer's overall responsibility regarding safety. Additionally, a structured Health and Safety Management System (HSMS) based on **IS/ISO 45001** ensures hazard identification, safety planning, and compliance with legal frameworks. This standard aims to protect workers and environment; ensure legal compliance; and improve productivity through fewer incidents.

3. IS 15656 : 2006 - Hazard Identification and Risk Analysis - Code of Practice

This standard describes specific techniques to prevent human and property osses in the operation and management of process plant. The overall methodology presented in this standard allows systematic identification of hazards as well as quantification of the risks associated with the operation of process plants. This standard aims to minimizes accidents and enable proactive

decision-making. Additionally, **IS 3786 : 2022** prescribes basic methods for recording and classifying industrial accidents. It also includes details of work injury and gives the methods for computation of frequency, severity and incidence rates of work injuries in industrial premises.

4. IS 3786 : 2022 : Method for computation of frequency and severity rates for industrial injuries and classification of industrial accidents

This standard prescribes basic methods for recording and classifying industrial accidents. It also includes details of work injury and gives the methods for computation of frequency, severity and incidence rates of work injuries in industrial premises. Occupational health and safety is a core responsibility of the employer and must be integrated into the management system, aligned with national regulations and international frameworks such as **IS/ISO 45001** and IS 3786.

5. IS 10386 (Part 2) : 2013 - Safety code for construction, operation and maintenance of river valley projects: Part 2 amenities, protective clothing and equipment (First Revision)

This standard lays down the requirements covering first aid and medical facilities, occupational health, environmental controls, ventilation, lighting, water supply, drainage, sanitation and personal protective clothing and equipment. This standard aims to prevent injuries and diseases; and promote worker well-being. The other standards that shall be referred to, while complying with IS 10386 (Part 2) are:

- IS 2925 (Helmets)
- IS 15298 (Footwear)
- IS 9167 (Respirators)

6. IS 10386 (Part 3) : 2014 - Safety code for construction, operation and maintenance of river valley projects: Part 3 plant and machinery (First Revision)

This standard lays down the safety requirements for plant and machinery used in river valley projects.

7. IS 10386 (Part 4) : 2013 - Safety code for construction, operation and maintenance of river valley projects: Part 4 handling, transportation and storage of explosives (First Revision)

This standard lays down requirements regarding storage of different classes of explosives, selection of site for magazine, maintenance and operation of magazine, transportation of explosives, their handling, loading, unloading and inspection as well as precautions to be taken therein.

8. IS 10386 (Part 5) : 2014 - Safety code for construction, operation and maintenance of river valley projects: Part 5 electrical aspects (First Revision)

This standard lays down the safety requirements covering indoor/outdoor electrical installations of generating stations, tunnels, electrical stores, pumping stations, including generators, breakers, isolators, transformers, current transformers, potential transformers, instrument transformers, gas insulated switch gear, cables, metal clad switch gear, lightning arrestors, motors, storage batteries, illumination systems, pumps, cranes and hoists, etc.

9. IS 10386 (Part 6) : 2020 - Safety code for construction operation and maintenance of river valley projects: Part 6 construction

This standard lays down the safety requirements regarding scaffolds, platforms, gangways and runs, ladders, ramps, openings, dangerous corners, forms for concrete, grouting and guniting, structural steel erection, welding, riveting and cutting, painting storage of materials like cement, pipes, poles, steel, sand, gravel, crushed stone, paints, etc.

10. IS 10386 (Part 7) : 2020 - Construction, Operation and Maintenance of River Valley Projects — Safety Code Part 7 Fire Safety Aspects (First Revision)

This standard lays down the fire safety requirements in river valley projects covering the following components and aspects:

a) Main components, such as dams, canals, tunnels, penstocks, control structures, valve houses, distribution stations, transformer and switch yards;
b) Buildings both permanent and temporary;
c) Forest - Where most of the river valley projects are located either in hills or foot hills; and
d) Hydropower stations and their allied equipment.

11. IS 10386 (Part 8) : 2024 - construction operation and maintenance of river valley projects - Safety code : Part 8 open excavation (first revision)

This standard lays down requirements for the safety aspects to be taken during excavation for structure like dams, barrages, power houses, canals, channels and such other structures associated with river valley projects.

12. IS 10386 (Part 9) : 1998 - Safety code for operation and maintenance of river valley projects: Part 9 canals and cross drainage works

This standard lays down guidelines for safety measures to be adopted during operation of a canal/cross drainage work.

13. IS 10386 (Part 10) : 1983 - Safety code for construction, operation and maintenance of river valley projects: Part 10 Storage, handling, detection and safety measures for gases, chemicals and flammable liquids

This standard lays down the requirements regarding storage, handling, detection and safety measures for gases, chemicals and flammable liquids used in river valley projects.

14. IS 10386 (Part 11) : 2012 - Safety Code for Construction, Operation and Maintenance of River Valley Projects: Part 11 Underground Excavation

This standard lays down requirements for the safety aspects to be taken during underground excavation for structures like underground power house, transformer cavern, tunnels, shafts such as surge shaft, pressure shaft and cable shaft, additionally driven intermediate tunnels (ADITs) and such other structures associated with river valley projects. Safety measures that should be followed during their operation and maintenance are also described.