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SAFETY CODE FOR CONSTRUCTION, OPERATION AND MAINTENANCE OF RIVER VALLEY PROJECTS

PART I GENERAL ASPECTS

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Safety in Construction, Operation and Maintenance of River Valley Projects Sectional Committee, BDC 67

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(*Continued from page* 1)

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Assistant Director (Civ Engg), IS1

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SAFETY CODE FOR CONSTRUCTION, OPERATION AND MAINTENANCE OF RIVER VALLEY PROJECTS

PART I GENERAL ASPECTS

0. FOREWORD

0.1 This Indian Standard (Part 1) was adopted by the Indian Standards Institution on 18 April 1983, after the draft finalized by the Safety in Construction, Operation and Maintenance of River Valley Projects Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 With large scale increase in construction activity of river valley projects, the number of major accidents have increased. The degree of safety achieved in project constructions has a direct bearing on the amount of effort expended to avoid accidents by those who control the conditions and practices on the project.

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1. SCOPE

1.1 This standard (Part 1) 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.

2. SAFETY PROGRAMME

2.1 Each contractor, private or government agency, shall have facilities for conducting a safety programme, commensurate with the magnitude of work under contract. Details of safety programme to be adopted by the contractor shall be given by the Contracting Officer/Engineer-in-Charge, prior to the start of construction operation. The programme shall give details of the provisions proposed by the contractor, to provide for safety of the employees and for elimination health hazards. In case the work is undertaken by a government agency itself, the chief executive or the chief authority shall appoint an organization to prepare a detailed safety programme approved by the Chief Executive,

2.2 Safety Personnel — Each contractor/government agency shall designate a competent employee, as a supervisor, responsible for carrying out the safety programme. He shall create an organization, commensurate with the project activities, consisting of other staff as required for suitable development.

2.3 **Pre-construction Safety Meetings** — Representatives of contractor shall meet the Contracting Officer/Engineer-in-Charge prior to start of construction activities for the purpose of discussing safety standards and requirements applicable to the work under contract. In case of government agency is executing the work the manager of safety organization shall discuss with construction executive the safety programme before the start of work.

2.4 **Joint Safety Policy Meetings**

2.4.1 The contractor or his representative shall participate in joint safety policy meetings held once in two months, along with the contracting agent and contactor or his representatives. These meetings shall be utilized to review the effectiveness of safety measures/efforts, provided by the contractor and to improve and coordinate safety activities, as required.

2.4.1.1 In case of departmental work, the manager of safety organization shall hold meetings on safety programme to educate the workers about the necessity and meaningfulness of safety regulations, precautions and review the effectiveness of the efforts made by his organization.

2.4.2 The use of films on safety programmes shall be encouraged for education of the staff, contractors and workmen and their display shall be held at regular intervals at the project sites.

2.5 Safety Meetings — A minimum of one, 'on the job or tool box' safety meeting shall be conducted every month by all field supervisors or foremen and it shall be attended by all the mechanics and labourers at the work site.

2.5.1 The contractor shall also regularly organise safety meetings for all job supervisors at least once a month.

3. ENFORCEMENT OF REGULATIONS

3.1 The Contracting Officer/Engineer-in-Charge shall ensure that the contractor is exercising at all times, reasonable and proper precautions for the safety of people at works and is complying with the provisions of current safety rules according to relevant Indian Standards, *Indian Electricity Rules* and construction codes of State Governments. In case of any negligence or default, he shall be penalized suitably and a clause to this effect shall always be incorporated in the contract. A register may

be maintained or OK cards may be introduced, duly signed by the Contracting Officer or his representative and the representative of contracting agency, before the start of any item of work. It may be reviewed monthly.

3.2 The safety staff shall 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 which may be kept at various places.

4. QUALIFICATIONS OF EMPLOYEES

4.1 **Requirement** — Throughout the course of contract persons employed shall be physically fit and qualified to perform their assignments/duties. Employees shall not knowingly be permitted or required to work in a manner that their ability or alertness is so impaired because of fatigue, illness or any other reason, that it may expose them and/or others to injury.

4.1.1 In case of mechanical jobs, the operators shall not be less than 18 years of age and shall have a operator's/driver's licence or permit for the equipment being operated by them, issued by the competent authority, as per the requirement of *Motor Vehicle Act.* Marine divers shall be fully qualified with respect to training, experience and physical condition to perform the required type of diving and to perform the work involved. A current physical fitness certificate from project medical officer or any other medical officer authorized by project authority shall be required for all diving personnel.

4.2 **Minors and Women Workers** — Contractor/goverment agency shall comply with all applicable State bye-laws and codes related to employment of minors and women.

4.3 **Physical Examination Required** — Hoist operators, shovel/crane operators, tractor/bull dozer operators, vehicle drivers or any other hauling-heavy equipment operators, shall be examined and a physical fitness certificate shall be obtained once in year during service from a project medical officer or any other medical officer authorized by project authority. A copy of such certificate shall be submitted to the Contracting Officer/Engineer-in-Charge by the contrator/government agency executing the work, if so required.

5. TRAINING FOR SAFETY

5.1 The contracting agency/contractor shall impart industrial safety courses to its officers, safety managers, safety supervisors, foremen, etc. In plants, training on industrial safety may be conducted for the

construction supervisors. The engineering staff may impart training course to the artisans, operators, mechanics, foremen and other allied supervisors.

5.1.1 Safety equipment shall be issued to the workers for this use.

5.2 Each employee shall be provided with the initial indoctrination, including instructions related to pertinent job, reporting of accidents and availability of first-aid and medical facilities.

5.2.1 Safety course may be organized at least once a year so that the safety organization is abreast with the latest techniques and bye-laws. The foremen, safety supervisors may impart lectures to the workmen regularly and watch the effectiveness of the programme.

5.3 Employees shall not leave naked fires unattended. Smoking shall not be permitted around fire prone areas and fire fighting equipment as per relevant Indian Standards shall be provided at crucial location.

5.4 Employees under the influence of any intoxicants shall not be permitted to remain at work.

6. CONTRACTOR/CHIEF EXECUTIVE'S SPECIAL RESPONSIBILITIES

6.1 It is the prime duty of the contractor/chief executive to ensure that the safety manager be given the status necessary to enable him to carry out his duties in collaboration with all grades of line management. He shall be specialized in accident prevention and general safety. He should try to ensure that basic safety principles are incorporated in the planning stage of operation of machines, equipment, process work, storage, distribution, etc. He should not only provide a safe working environment but also help to facilitate production.

6.1.1 Special safety techniques may be employed to remove causes of accidents. Broadly, these fall into two categories, (a) those which try to remove the physical causes by providing safe working environment, (b) those try to create a correct personal attitude.

7. REPORTS

7.1 Each employer/contractor shall maintain an accurate record and shall report to the contracting officer in the manner and on forms prescribed by the Contracting Officer, all cases of injuries/depths, occupational diseases, disabilities, etc, arising out of or in the course of employment on the work under contract. Monthly reports of all accidents shall promptly be submitted by the contractor to the Engineer-in-Charge giving such details as may be prescribed by the project authorities.

7.1.1 All accidents shall be reported immediately to the Contracting Officer/Engineer-in-Charge on a prescribed proforma laid down by the project authorities and every assistance shall be given in the investigation of accident including submission of a comprehensive narrative report. Further, other accidental occurances with serious accident potential such as equipment failures, slides, cave-ins, etc, shall likewise be reported immediately.

7.2 A well designed injury reporting system shall be introduced on each project. It will automatically bring out a lot of valuable information, useful in accident prevention work.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	S
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m²
Frequency	hertz	HZ	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m²