यूनाइटेड इंडिया इंश्योरेंस कंपनी लिमिटेड
UNITED INDIA INSURANCE CO. LTD.

मंडल कार्यालय न. 10, 77,वल्कन इन्श्योरेन्स बिल्डिंग, ग्राउन्ड फ्लोर, वीर नरीमन रोड मुंबई-400020
Divisional office no. 10, 77, Vulcan Insurance Building, Ground Floor, Veer Nariman Road, Mumbai 400020

Attached to and forming part of policy no 0210002123P116526607

TERMS & CONDITIONS

1.(Exlcuding High Risk Areas* - for War Risk).
For the marine cargo policies incepting on or after 00:01 hrs I.S.T. 15th October 2021 War and SRCC rates for shipments to High Risk Area (HRA) would be – Minimum 0.025% (gross rate) For the purpose of common understanding transits through HRA have been defined as shipments that are either commencing from and/or destined for ports as per annexure A attached (provisional list of ports). Shipments transiting the aforementioned areas will be subject to a minimum additional Gross Rate of 0.025% for the final sum insured value of shipment purely to cover War/SRCC coverage during vessel being in High Risk Area.
Base premium rate to apply in addition to War & SRCC additional premium for each shipment.

2.Storage risk only during ordinary course of transit shall be covered as per Cargo Termination of Storage in Transit Clause. No intentional storage will be covered.

3Coverage will be subject to Invoice Incoterms.

4.Returned / Rejected goods / Second hand machinery shall be covered as per ICC B / ITC B.

5.No liability is to attach in respect of declarations in excess of amount/limits insured by this policy.

6.Capital goods and Sales/Purchase returns/Container value to be declared separately and additional premium to be collected on the same.

Warranties

1. Warranted that the subject matter insured is properly lashed and secured in the carrying conveyance/container
2. Warranted shortage from seal intact containers is not covered in the policy
3. Warranted that unless containerized goods are transported in vehicle/ or trucks covered with tarpaulin and/or adequately covered with weather proof material to avoid ingress of water (during Inland leg of transit).
4. Warranted the vessel/vehicle/cargo hold/container is clean and fit for carriage of cargo
5. Warranted cargo is carried under-deck unless it is containerized

6. Warranted for imported cargo where the responsibility of insurance attaches to the insured after arrival &/ or discharge of cargo over side the vessel such additional transit shall be covered on ITC 'A' and SRCC terms (tail end transits) only if pre-despatch survey is carried out otherwise cover will be as per ITC B
7. Barge Transshipment Cover as per ICC(B) Clause as per following Warranties:-
   1) Warranted barge movement will not take place during rough weather conditions and/or during weather warning periods issued by the competent authority.
   2) Warranted barges hold valid statutory licenses and certificates including certificate of survey.
   3) If the barge is towed it is warranted that tug and towing plan to be certified by an IRDA approved surveyor at assured's cost.
8. Warranties for cargo in Bulk:
   1. Supervised loading and unloading at the insured's cost.
   2.Warranted Certificate of Cleanliness and fitness of Tank Pipelines and Shore Installation and Certificate of
   quality and sampling obtained at Ports/ Railway stations of Loading/ discharging (for bulk liquid by Sea/Rail).
   3. Warranted certificate of cleanliness and fitness of Hold of Vessel to Load cargo is obtained at load port
9. • Over Dimensional cargo is covered subject to the below given warranty:
   In case of ODC: Warranted loading unloading fastening lashing and barging (if any) crane suitability truck/trailer capability and the entire operation of logistics including deck stowing to be supervised by IRDA approved surveyor at assured's cost and the recommendations of such surveyor be complied with.
   • Route survey to be done in cases of ODC
   ODC Definition: 1) Any Cargo which including packing has dimensions in excess of 12 Meters length and/or 2.5 Meters wide and/or 2.5 Meters high [or US equivalent] and therefore does not fit inside a standard 40 foot container or equivalent road trailer. 2) Any Cargo including packing with a weight in excess of 30 Metric Tonnes.
10. If the weight of the cargo exceeds than Registration Laden weight / Licensed Carrying Capacity of the vehicle as mentioned in the Registration Certificate of the vehicle and insured is privy to it then any loss or damage arising out of such transit is not covered under the above mentioned policy.

Exclusions

1. Unexplained shortages / rejections and trade losses / quality losses.
2. Movement of Fragile items from scope of policy
3. Unexplained shortages / losses shortages from seal intact containers / sound packages are excluded from the scope of the policy.
4. Excluding mould mildew fungus vermin moth condensation insect infestation stains moisture unless caused by ICC B / ITC B perils.
5. Losses due to heating / sweating / Contamination / adulteration / deterioration of quality unless caused by ICC B / ITC B perils.

6. Rusting / Oxidation / Discolouration unless caused by external accidental physical and visible means.
7. Losses due to electrical / electronic / mechanical dearrangement unless caused by external accidental physical and visible means.
8. Losses due to breaking bending denting chipping chafing marring scratching or crushing unless caused by external accidental physical and visible means.

Clauses

- Sea Shipments

Institute Cargo Clauses (A) 1/1/09
Institute Cargo Clauses (B) 1/1/09
Institute Strikes Clauses (Cargo) 1/1/09
Institute War Clauses (Cargo) 1/1/09
Cargo ISM Endorsement

- Air Shipments

Institute Cargo Clauses (Air) (excluding sendings by Post) 1/1/09
Institute Strikes Clauses (Air Cargo) 1/1/09
Institute War Clauses (Air Cargo) (Excluding sendings by post)1/1/09

- Courier Shipments

Registered Post Parcel Clause Duly Amended For Courier Shipments
Strike Riots civil commotion Clause

- Post Parcel Shipments

Registered Post Parcel Clause
Strike Riots civil commotion Clause

- Land shipments

Inland Transit (Rail or Road) A-All risks - 2010
Inland Transit (Rail or Road) B-Basic risks - 2010
Strike Riots civil commotion Clause - 2010

- Institute Radioactive Contamination chemical biological bio-chemical & electromagnetic weapons exclusion clause - 10.11.03
- CARGO TERMINATION OF STORAGE IN TRANSIT CLAUSE(AMMENDED)
- Termination of Transit Clause (Terrorism)
- Institute Extended Radioactive Contamination Exclusion clause 01.11.2002.
- Limitation of Liability Clause –
- Duty Clause
- Important Notice Clause
- Institute Replacement Clause for Second hand machinery:
- Sanctions Limitation and Exclusion Clause:
- Institute Cyber Attack Exclusion Clause

- Institute War Cancellation Clause:
- Institute Strike Cancellation Clause :
- Communicable Disease Exclusion Clause (Cargo) :
- CORONAVIRUS EXCLUSION

Authorised Signatory

UNITED INDIA INSURANCE COMPANY LIMITED

VULCAN INSURANCE BUILDING, 77, GROUND FLOOR, VEER NARIMAN ROAD, CHURCHGATE, MUMBAI
MUMBAI - 400020 MAHARASHTRA
PHONE: (022) 22049948 FAX: EMAIL:

MARINE CARGO OPEN POLICY
Policy No. :0210002123P114098172

PERIOD OF INSURANCE
from 00:00 hrs of 01/02/2024
to midnight of 31/01/2025

Insured

M/S MANGALORE REFINERY AND PETROCHEMICALS LIMITED
KUTHETHOOR P.O. VIA KATIPALLA, MANGALORE
KANARA - SOUTH (MANGALORE)
KARNATAKA
575030

Agent Name	:
Agent Code	:
Mobile/Landline Number/Email	:

The genuineness of the policy can be verified through "Verify Your Policy" link at www.uiic.co.in.

For any Information, Service Requests, Claim Intimation and Grievances please write to 021000@uiic.co.in

This document is digitally signed
Signer: KALAIVENI SUBBIAH
Date: Mon, Jan 29, 2024 15:42:34 IST
Location: United India Insurance Company Ltd
Reason: Signing Policy for UIIC

MARINE CARGO OPEN POLICY

WHEREAS the ASSURED named in the schedule hereto, have represented to UNITED INDIA INSURANCE COMPANY LIMITED (hereinafter called the 'Company') that they are interested in or duly authorised to make the insurance mentioned and described and have paid the premium hereinafter stated.

THE COMPANY HEREBY PROMISES AND AGREES with the Assured, their Executors, Administrators and Assigns that the Company will insure against loss, damage, liability or expense subject to the clauses,endorsements,conditions and warranties contained in the schedule and/or attached hereto.

SCHEDULE

Policy No.	0210002123P114098172	Previous Policy No					
Name Of Insured/ID	M/S MANGALORE REFINERY AND PETROCHEMICALS LIMITED/ 23024237007						
Tel.(O)	22173000	Fax		Tel.(R)	22173000	Mobile	7899865009
Business/Occupation	None			Email	mrplmlr@mrplndia.com		
Period Of Insurance	From 00:00 Hours of 01/02/2024 To Midnight Of 31/01/2025						

CO-INSURANCE DETAILS:	UIIC 021000 : 100%
NET PREMIUM:	As Agreed

Total Sum Insured :	₹ 4,500,000,000.00
Basis of Valuation : +(0)	

Limit Per Sending(₹)	200,000,000.00	Limit Per Location(₹)	200000000 | Mode of Transit:-Air,Courier,Road,Rail,

Journey From	Journey To	Mode of Transit
ANYWHERE IN INDIA	ANYWHERE IN INDIA	Air
ANYWHERE IN INDIA	ANYWHERE IN INDIA	Coastal Waters by Country Craft
ANYWHERE IN INDIA	ANYWHERE IN INDIA	Road
ANYWHERE IN INDIA	ANYWHERE IN INDIA	Rail
ANYWHERE IN INDIA	ANYWHERE IN INDIA	Courier

ID	Subject Matter(Commodity Description)	Commodity Type	Invoice Amount(₹)
1	AS PER TENDER	OTHERS	4,500,000,000.00

This Insurance is to remain in force for a period of 12 months, as stated above, unless the sum insured is previously exhausted by declaration.

Terms Of Insurance Cover : As per the following Clauses.
Important Notice
Institute Radio-Active Contamination Exclusion Clause
Open Policy Clause
Chemical, Biological, Bio-chemical and Electromagnetic Weapons Exclusions Clause
Sailing Vessels Clause
Inland Transit (Rail or Road) (A)
Institute Cargo Clauses (Air Cargo)
Sanction Limitation and Exclusion Clause
Institute Cargo Clause (A)
Strike, Riots and Civil Commotion Clause
Institute Classification Clause
Open Policy Clause
Institute war cancellation clause
Specified Territory Exclusion Clause

The declaration should be furnished within 15 days from the date of shipment in case of imports or arrival of ship whichever is earlier.

Adequate Sum Insured should be available for the relevant despatch as on date of RR/LR/BL/AWB

CLAIMS INTIMATION AND SURVEY:
In the event of loss or damage which may result in a claim under the Insurance, immediate notice must be given to Policy issuing office.

CLAIMS SETTLEMENT:
The claim is payable by Policy issuing office.

Underwriter Remarks	Policy for all incoming material (other than crude oil) & all outgoing materials (including equipment's sent for repair/calibration/job work/Used & unused Catalyst etc.) including Project procurements for DOMESTIC TARIFF AREA. Policy will be subject to below terms & conditions: 1. Storage risk only during ordinary course of transit shall be covered as per Cargo Termination of Storage in Transit Clause. No intentional storage will be covered. 2. Returned / Rejected goods / Secondhand machinery shall be covered as per ICC B / ITC B. 3. Coverage will be subject to Invoice Incoterms.

Commodity Wise Cover Details:-

Commodity Description	Commodity Type	Cover Name	SI(₹)	Premium(₹)
AS PER TENDER	OTHERS	ITC A	4,500,000,000.00	270,000.00
		ICC Air		
		Sailing Vessel Cover		
		Courier Cover		

Addon Covers:-

Cover Description	SI(₹)	Premium(₹)
SRCC	4,500,000,000.00	45,000.00

Net Premium :	₹	315,000.00
IGST(18%) :	₹	56,700.00
Stamp Duty :	₹	1.00
Total :	₹	371,701.00
Receipt No. :		10102100023115877224
Receipt Date :		29/01/2024

Agency/Broker Code:
Dev.Officer Code:

Excess Details:-

ID	Commodity Description	On Each Consignment(%)	Approval Authority Reference
1	AS PER TENDER	0	

1) The consignment value for applying excess shall be the Insured value for the relevant transit per the relevant conveyance.

Customer GST/UIN No.:	29AAACM5132A1ZZ	Office GST No.:	27AAACU5552C1ZJ
SAC Code:	997135	Invoice No. & Date:	2123I114098172 & 29/01/2024
Amount Subject to Reverse Charges-NIL			

We hereby declare that though our aggregate turnover in any preceding financial year from 2017-18 onwards is more than the aggregate turnover notified under sub-rule (4) of rule 48, we are not required to prepare an invoice in terms of the provisions of the said sub-rule.
Anti Money Laundering Clause:-In the event of a claim under the policy exceeding ₹ 1 lakh or a claim for refund of premium exceeding ₹ 1 lakh, the Insured will comply with the provisions of AML policy of the company. The AML policy is available in all our operating offices as well as Company's web site.

LET US JOIN THE FIGHT AGAINST CORRUPTION. PLEASE TAKE THE PLEDGE AT https://pledge.cvc.nic.in.

Date of Proposal and Declaration: 01/02/2024
IN WITNESS WHEREOF,the undersigned being duly authorised has hereunto set his/her hand at DO 10 MUMBAI 021000 on this 25th day of January 2024 .

For and On behalf of
United India Insurance Co. Ltd.

Duly Constituted Attorney(s)

Underwritten By - RAJ34311 (DO UW CUM CASHIER) , Approved By - VIV34313(RO UNDERWRITER NEW)

Affix Policy Stamp here.

IMPORTANT NOTICE

Procedure in the event of Loss or Damage for which Underwriters may be liable.

LIABILITY OF CARRIERS, BAILEES OR OTHER THIRD PARTIES

It is the duty of the Assured and their Agents, in all cases to take such measures as may be reasonable for the purpose of averting or minimizing a loss and to ensure that all rights against Carriers Bailees or other third parties are properly preserved and exercised. In particular, the Assured or their Agents are required:-

1 To claim immediately on the Carriers , Port Authorities or other Bailees for any missing packages.
2 To apply immediately for survey by Carrier's or other Bailee's Representative, if any loss or damage be apparent and claim on the carriers or other Bailees for any actual loss or damage found at such survey.
3 In a circumstance,except under written protest, to give clean receipts where goods are in doubtful condition.
4 To give notice in writing to the Carriers or other Bailees within 3 days of delivery if the loss or damage was not apparent at the time of taking delivery.
Note : The Consignees or their Agents are recommended to make themselves familiar with the Regulation of the port Authority at the port of discharge.

SURVEY AND CLAIM SETTLEMENT

In the event of loss or damage which may involve a claim under this insurance immediate notice of such loss or damage should be given to and a survey Report obtained from Lloyd's Agents as below.
In the event of any claim arising under this insurance request for settlement should be made to
who is/are authorized by United India Insurance Co. Ltd. to adjust and settle claims on behalf of the Company.

DOCUMENTATION OF CLAIMS

To enable claims to be dealt with promptly the Assured or their Agent are advised to submit all available supporting documents without delay,including when applicable:-

1 Original policy or certificate of insurance.
2 Original or copy of shipping invoices, together with shipping specification and/or weight notes.
3 Original Bill of Lading and/or other contract of carriage.
4 Survey report or other documentary evidence to show the extent of the loss or damage.
5 Landing account and weight notes at final destination.
6 Correspondence exchanged with the Carriers and other Parties regarding their liability for the loss or damage.

1.11.2002 INSTITUTE EXTENDED RADIOACTIVE CONTAMINATION EXCLUSION CLAUSE

This clause shall be paramount and shall override anything contained in this Insurance inconsistent therewith

1. In no case shall this insurance cover loss damage liability or expense directly or indirectly caused by or contributed to by or arising from
   1.1 ionizing radiations from or contamination by radioactivity from any nuclear fuel or from any nuclear waste or from the combustion of nuclear fuel
   1.2 the radioactive, toxic, explosive or other hazardous or contaminating properties of any nuclear installation, reactor or other nuclear assembly or nuclear component thereof
   1.3 any weapon or device employing atomic or nuclear fission and/or fusion or other like reaction or radioactive force or matter.
   1.4 the radioactive, toxic, explosive or other hazardous or contaminating properties of any radioactive matter. The exclusion in this sub-clause does not extend to radioactive isotopes, other than nuclear fuel, when such isotopes are being prepared, carried, stored, or used for commercial, agricultural, medical, scientific or other similar peaceful purposes.

RADIOACTIVE CONTAMINATION EXCLUSION CLAUSE(U.S.A ENDORSEMENT)

This insurance is subject to the Institute Extended Radioactive Contamination Exclusion Clause 1st November 2002 provided That if fire is an insured peril and where the subject matter insured or in the case of a reinsurance, the subject matter by the original insurance, is within the U.S.A, its Islands, onshore territories or possessions and a fire arises directly or indirectly from one or more of the causes detailed in sub-clauses 1.1, 1.2 and 1.4 of the Institute Extended Radioactive Contamination Exclusion Clause 1.11.2002 any loss or damage arising directly from that fire shall, subject to the provisions of this insurance(reinsurance), be covered, EXCLUDING however any loss damage liability or expense caused by nuclear reaction, nuclear radiation or radioactive contamination arising directly or indirectly from that fire.

CHEMICAL, BIOLOGICAL, BIO- CHEMICAL AND ELECTROMAGNETIC WEAPONS EXCLUSIONS CLAUSE

With respect to the peril of Terrorism as defined in the Terrorism Exclusion Clause, this clause shall be paramount and shall override anything contain in this Insurance inconsistent therewith.

1. In no case shall this insurance cover loss damage liability or expense directly or indirectly caused by or contributed to by or arising from
   1.1 Any chemical, biological, bio-chemical or electromagnetic weapon or device.

Cancellation Clause: The Company may at any time cancel the Policy on grounds of misrepresentation, fraud, non-disclosure of material fact or non-cooperation by the Insured by sending fifteen days notice in writing by Registered A/D to the Insured at his last known address in which case the Company shall return to the Insured a proportion of the last premium corresponding to the unexpired period of Insurance if no claim has been paid under the policy. The Insured may at any time cancel this policy and in such event the Company shall allow refund of premium at Companys short period rates provided no claim has occurred upto the date of cancellation.

OPEN POLICY CLAUSES

1 This open Policy is effected to insure the interest specified herein despatched either by or for account of the Assured in which they have an insurable interest.
It is a condition of the Policy that the Assured are bound to declare hereunder each and every consignment without exception, underwriters being bound to accept upto but not exceeding the amount specified in Clause IV below

PERIOD OF POLICY
2 This Policy is to remain in force for a period of 12 months From 01/02/2024 to 31/01/2025 (both days inclusive) unless cancelled previously by either side as per Cancellation Clause herein or Sum Insured is exhausted by declarations whichever is earlier.

DECLARATION CLAUSE
3 The assured warrants that during the currency of this Open Policy they will declare to the company within 48 hours from the time risk attaches, all shipments to which this Open Policy attaches, failure to so declare shall at the Company's option render this Open Policy void as from the date of such failure. Acceptance of any declaration by the Company declared after the time limit stipulated in this warranty shall not be taken as a waiver and as a precedent for future declarations.
(OR)
It is hereby agreed that the Insured will record full particulars of each despatch in Declaration Statement in the chronological order assigning declaration number for each such despatch. A copy of the statement so completed, should be posted to the Company every fortnight/month, preferably during the first week of the following fortnight/month.(Strike whichever is not applicable)

LIMIT PER CONVEYANCE
4 This Policy is for total Sum Insured of ₹4,500,000,000.00 however the amount declarable on any one despatch/sending is subject to a limit of ₹200,000,000.00 per conveyance and/or ₹ 200000000 | Mode of Transit:-Air,Courier,Road,Rail, per location.

VALUATION CLAUSE
5 This shipments insured hereunder are to be valued at the invoice cost plus the expenses of and incidental to shipping (if not already included in the invoice cost) and the charges of Insurance plus 10% upon the whole unless declared otherwise to the Company before shipment and before any known or reported loss.

CANCELLATION CLAUSE
6 This Policy is subject to cancellation by either party on giving 7 days Notice in writing to this effect (except in the cases of SR & CC risks which is subject to 48 hours notice of cancellation). Notice Period shall commence from midnight of the day when it is issued. But cancellation shall not apply to any risks which have attached in accordance with the cover granted hereunder before the cancellation becomes effective.

INSPECTION OF RECORDS
7 The Company and/or its Agent will have the privilege at any time during business hours to inspect assured's records of despatches made within the terms of the Open Policy.

CLAIMS
8 In the event of any loss which may give rise to a claim under this Open Policy, immediate notice thereof in writing should be given to this office of the Company at VULCAN INSURANCE BUILDING, 77, GROUND FLOOR, VEER NARIMAN ROAD, CHURCHGATE, MUMBAI MUMBAI MAHARASHTRA 400020 and also to the Company's Divisional Office nearest to the destination or the place of loss for holding a survey, if necessary.
The liability of the Company is only to succeed and not in any way supercede any claim which the Insured may be entitled to make upon any carriers or other bailee who are primarily liable for the loss.

CONDITION PRECEDENT
9 The due observance and fulfillment of the terms and conditions of this contract in so far as these relate to anything to be done or complied with by the Assured shall be condition precedent to the liability of the Company to make payments hereunder.

OTHER CONDITIONS, IF ANY(AS ATTACHED)

Sanctions Limitation and Exclusion Clause

No Insurer shall be deemed to provide cover and no Insurer shall be liable to pay any claim or provide any benefit hereunder to the extent that the provision of such cover payment of such claim or provision of such benefit would expose that insurer to any sanction, prohibition or restriction under United Nations resolutions or the trade or economic sanctions laws or regulations of the European Union, United Kingdom or the United States of America.

Specified Territory Exclusion Clause

Notwithstanding anything to the contrary herein, all Specified Territory Exposures whether direct or indirect, are excluded, The term Specified Territory Exposure includes but is not limited to any activity, transaction, legal proceedings, operation, entity, subsidiary, headquarters , branch, products, good, property, asset , services in a Specified Territory or, as applicable, delivered to, located in, originating in, transitioning from, to or through a Specified Territory, as well as any person ordinarily resident in a Specified Territory, the government of a Specified Territory as well as any entity owned or controlled by an entity in a Specified Territory including, without limitation affiliates outside of a Specified Territory. Specified Territory means The Republic of Belarus, Ukraine, and/or The Russian Federation.

1/1/09

INSTITUTE CARGO CLAUSES (AIR)
(excluding sendings by Post)

RISKS COVERED

Risks

1 This insurance covers all risks of loss of or damage to the subject-matter insured except as excluded by the provisions of Clauses 3,

4 and 5 below.

Salvage Charges

2. This insurance covers salvage charges incurred to avoid or in connection with the avoidance of loss from any cause except those excluded in Clauses 3, 4 and 5 below.

EXCLUSIONS

3. In no case shall this insurance cover

3.1 loss damage or expense attributable to wilful misconduct of the Assured
3.2 ordinary leakage, ordinary loss in weight or volume, or ordinary wear and tear of the subject-matter insured
3.3 loss damage or expense caused by insufficiency or unsuitability of packing or preparation of the subject matter insured to withstand the ordinary incidents of the insured transit where such packing or preparation is carried out by the Assured or their employees or prior to the attachment of this insurance (for the purpose of these Clauses "packing" shall be deemed to include stowage in a container and "employees" shall not include independent contractors)
3.4 loss damage or expense caused by inherent vice or nature of the subject-matter insured
3.5 loss damage or expense arising from unfitness of aircraft conveyance or container for the safe carriage of the subject-matter insured, where loading therein or thereon is carried out prior to attachment of this insurance or by the Assured or their employees and they are privy to such unfitness at the time of loading. This exclusion shall not apply where the contract of insurance has been assigned to the party claiming hereunder who has bought or agreed to buy the subject-matter insured in good faith under a binding contract.
3.6 loss damage or expense caused by delay, even though the delay be caused by a risk insured against
3.7 loss damage or expense caused by insolvency or financial default of the owners managers charterers or operators of the aircraft where, at the time of loading of the subject-matter insured on board the aircraft, the Assured are aware, or in the ordinary course of business should be aware, that such insolvency or financial default could prevent the normal prosecution of the transit
This exclusion shall not apply where the contract of insurance has been assigned to the party claiming hereunder who has bought or agreed to buy the subject-matter insured in good faith under a binding contract
3.8 oss damage or expense directly or indirectly caused by or arising from the use of any weapon or device employing atomic or nuclear fission and/or fusion or other like reaction or radioactive force or matter.

4 In no case shall this insurance cover loss damage or expense caused by

4.1 war civil war revolution rebellion insurrection, or civil strife arising therefrom, or any hostile act by or against a belligerent power
4.2 capture seizure arrest restraint or detainment (piracy excepted), and the consequences thereof or any attempt thereat
4.3 derelict mines torpedoes bombs or other derelict weapons of war.

5 In no case shall this insurance cover loss damage or expense
5.1 caused by strikers, locked-out workmen, or persons taking part in labour disturbances, riots or civil commotions
5.2 resulting from strikes, lock-outs, labour disturbances, riots or civil commotions
5.3 caused by any act of terrorism being an act of any person acting on behalf of, or in connection with, any organisation which carries out activities directed towards the overthrowing or influencing, by force or violence, of any government whether or not legally constituted
5.4 caused by any person acting from a political, ideological or religious motive.

DURATION
Transit Clause

6 6.1 Subject to Clause 9 below, this insurance attaches from the time the subject-matter insured is first moved in the warehouse, premises or at the place of storage (at the place named in the contract of insurance) for the purpose of the immediate loading into or onto the carrying vehicle or other conveyance for the commencement of transit, continues during the ordinary course of transit and terminates either
6.1.1 on completion of unloading from the carrying vehicle or other conveyance in or at the final warehouse, premises or place of storage at the destination named in the contract of insurance,
6.1.2 on completion of unloading from the carrying vehicle or other conveyance in or at any other warehouse, premises or place of storage, whether prior to or at the destination named in the contract of insurance, which the Assured or their employees elect to use either for storage other than in the ordinary course of transit or for allocation or distribution, or
6.1.3 when the Assured or their employees elect to use any carrying vehicle or other conveyance or any container for storage other than in the ordinary course of transit or
6.1.4 on the expiry of 30 days after completion of unloading of the subject-matter insured from the aircraft at the final place of discharge, whichever shall first occur.
6.2 If, after unloading from the aircraft at the final place of discharge, but prior to termination of this insurance, the subject-matter insured is to be forwarded to a destination other than that to which it is insured, this insurance, whilst remaining subject to termination as provided in Clauses 6.1.1 to 6.1.4, shall not extend beyond the time the subject-matter insured is first moved for the purpose of the commencement of transit to such other destination.
6.3 This insurance shall remain in force (subject to termination as provided for in Clauses 6.1.1 to 6.1.4 above and to the provisions of Clause 7 below) during delay beyond the control of the Assured, any deviation, forced discharge, reshipment or transhipment and during any variation of the adventure arising from the exercise of a liberty granted to the air carriers under the contract of carriage.
Termination of Contract of Carriage

Termination of Contract of Carriage
7 If owing to circumstances beyond the control of the Assured either the contract of carriage is terminated at a place other than the destination named therein or the transit is otherwise terminated before unloading of the subject-matter insured as provided for in Clause 6 above, then this insurance shall also terminate unless prompt notice is given to the Insurers and continuation of cover is requested when this insurance shall remain in force, subject to an additional premium if required by the Insurers, either
7.1 until the subject-matter insured is sold and delivered at such place, or, unless otherwise specially agreed, until the expiry of 30 days after arrival of the subject-matter insured at such place, whichever shall first occur,
7.2 if the subject-matter insured is forwarded within the said period of 30 days (or any agreed extension thereof) to the destination named in the contract of insurance or to any other destination, until terminated in

accordance with the provisions of Clause 6 above.

Change of Transit

8. 8.1 Where, after attachment of this Insurance, the destination is changed by the Assured, this must be notified promptly to Insurers for rates and terms to be agreed. Should a loss occur prior to such agreement being obtained cover may be provided but only if cover would have been available at a reasonable commercial market rate on reasonable market terms.

8.2 Where the subject-matter insured commences the transit contemplated by this Insurance (in accordance with Clause 6.1), but, without the knowledge of the Assured or their employees the aircraft leaves for another destination, this Insurance will nevertheless be deemed to have attached at commencement of such transit.

CLAIMS

Insurable Interest

9 9.1 In order to recover under this Insurance the Assured must have an insurable interest in the subject matter insured at the time of the loss.

9.2 Subject to Clause 9.1 above, the Assured shall be entitled to recover for insured loss occurring during the period covered by this Insurance, notwithstanding that the loss occurred before the contract of insurance was concluded, unless the Assured were aware of the loss and the Insurers were not.

Forwarding Charges

10 Where, as a result of the operation of a risk covered by this Insurance, the insured transit is terminated at a place other than that to which the subject-matter insured is covered under this Insurance, the Insurers will reimburse the Assured for any extra charges properly and reasonably incurred in unloading storing and forwarding the subject-matter insured to the destination to which it is insured.
This Clause 10, which does not apply to salvage charges, shall be subject to the exclusions contained in Clauses 3, 4 and 5 above, and shall not include charges arising from the fault negligence insolvency or financial default of the Assured or their employees.

Constructive Total Loss

11 No claim for Constructive Total Loss shall be recoverable hereunder unless the subject-matter insured is reasonably abandoned either on account of its actual total loss appearing to be unavoidable or because the cost of recovering, reconditioning and forwarding the subject-matter insured to the destination to which it is insured would exceed its value on arrival.

Increased Value

12 12.1 If any Increased Value Insurance is effected by the Assured on the subject-matter insured under this Insurance the agreed value of the subject-matter insured shall be deemed to be increased to the total amount insured under this Insurance and all Increased Value insurances covering the loss, and liability under this Insurance shall be in such proportion as the sum insured under this Insurance bears to such total amount insured. In the event of claim the Assured shall provide the Insurers with evidence of the amounts insured under all other insurances.

12.2 Where this Insurance is on Increased Value the following clause shall apply: The agreed value of the subject-matter insured shall be deemed to be equal to the total amount insured under the primary insurance and all Increased Value insurances covering the loss and effected on the subject-matter insured by the Assured, and liability under this Insurance shall be in such proportion as the sum insured under this Insurance bears to such total amount insured. In the event of claim the Assured shall provide the Insurers with evidence of the amounts insured under all other insurances.

BENEFIT OF INSURANCE

13 This Insurance

13.1 covers the Assured which includes the person claiming indemnity either as the person by or on whose behalf the contract of insurance was effected or as an assignee,

13.2 shall not extend to or otherwise benefit the carrier or other bailee.

MINIMISING LOSSES

Duty of Assured

14 It is the duty of the Assured and their employees and agents in respect of loss recoverable hereunder

14.1 to take such measures as may be reasonable for the purpose of averting or minimising such loss, and

14.2 to ensure that all rights against carriers, bailees or other third parties are properly preserved and exercised and the Insurers will, in addition to any loss recoverable hereunder, reimburse the Assured for any charges properly and reasonably incurred in pursuance of these duties.

Waiver

15 Measures taken by the Assured or the Insurers with the object of saving, protecting or recovering the subject-matter insured shall not be considered as a waiver or acceptance of abandonment or otherwise prejudice the rights of either party.

AVOIDANCE OF DELAY

16 It is a condition of this Insurance that the Assured shall act with reasonable despatch in all circumstances within their control.

LAW AND PRACTICE

17 This Insurance is subject to English law and practice.

NOTE:- *Where a continuation of cover is requested under Clause 7, or a change of destination is notified under Clause 8, there is an obligation to give prompt notice to the Insurers and the right to such cover is dependent upon compliance with this obligation.*

CL387
01/01/2009

1/1/09

INSTITUTE CARGO CLAUSES (A)

RISKS COVERED

Risks

1. This insurance covers all risks of loss of or damage to the subject-matter insured except as excluded by the provisions of Clauses 4, 5, 6 and 7 below.

General Average

2. This insurance covers general average and salvage charges, adjusted or determined according to the contract of carriage and/or the governing law and practice, incurred to avoid or in connection with the avoidance of loss from any cause except those excluded in Clauses 4, 5, 6 and 7 below.

"Both to Blame Collision Clause"

3. This insurance indemnifies the Assured, in respect of any risk insured herein, against liability incurred under any Both to Blame Collision Clause in the contract of carriage. In the event of any claim by carriers under the said Clause, the Assured agree to notify the Insurers who shall have the right, at their own cost and expense, to defend the Assured against such claim.

EXCLUSIONS

4. In no case shall this insurance cover
4.1 loss damage or expense attributable to wilful misconduct of the Assured
4.2 ordinary leakage, ordinary loss in weight or volume, or ordinary wear and tear of the subject-matter insured
4.3 loss damage or expense caused by insufficiency or unsuitability of packing or preparation of the subject matter insured to withstand the ordinary incidents of the insured transit where such packing or preparation is carried out by the Assured or their employees or prior to the attachment of this insurance (for the purpose of these Clauses "packing" shall be deemed to include stowage in a container and "employees" shall not include independent contractors)
4.4 loss damage or expense caused by inherent vice or nature of the subject-matter insured
4.5 loss damage or expense caused by delay, even though the delay be caused by a risk insured against (except expenses payable under Clause 2 above)
4.6 loss damage or expense caused by insolvency or financial default of the owners managers charterers or operators of the vessel where, at the time of loading of the subject-matter insured on board the vessel, the Assured are aware, or in the ordinary course of business should be aware, that such insolvency or financial default could prevent the normal prosecution of the voyage
This exclusion shall not apply where the contract of insurance has been assigned to the party claiming hereunder who has bought or agreed to buy the subject-matter insured in good faith under a binding contract
4.7 loss damage or expense arising from the use of any weapon of war employing atomic or nuclear fission and/or fusion or other like reaction or radioactive force or matter.

5. 5.1 In no case shall this insurance cover loss damage or expense arising from

5.1.1 unseaworthiness of vessel or craft or unfitness of vessel or craft for the safe carriage of the subject-matter insured, where the Assured are privy to such unseaworthiness or unfitness, at the time the subject-matter insured is loaded therein

5.1.2 unfitness of container or conveyance for the safe carriage of the subject-matter insured, where loading therein or thereon is carried out
prior to attachment of this insurance or
by the Assured or their employees and they are privy to such unfitness at the time of loading.

5.2 Exclusion 5.1.1 above shall not apply where the contract of insurance has been assigned to the party claiming hereunder who has bought or agreed to buy the subject-matter insured in good faith under a binding contract.

5.3 The Insurers waive any breach of the implied warranties of seaworthiness of the ship and fitness of the ship to carry the subject-matter insured to destination.

6 In no case shall this insurance cover loss damage or expense caused by
6.1 war civil war revolution rebellion insurrection, or civil strife arising therefrom, or any hostile act by or against a belligerent power
6.2 capture seizure arrest restraint or detainment (piracy excepted), and the consequences thereof or any attempt thereat
6.3 derelict mines torpedoes bombs or other derelict weapons of war.

7 In no case shall this insurance cover loss damage or expense
7.1 caused by strikers, locked-out workmen, or persons taking part in labour disturbances, riots or civil commotions
7.2 resulting from strikes, lock-outs, labour disturbances, riots or civil commotions
7.3 caused by any act of terrorism being an act of any person acting on behalf of, or in connection with, any organisation which carries out activities directed towards the overthrowing or influencing, by force or violence, of any government whether or not legally constituted
7.4 caused by any person acting from a political, ideological or religious motive.

DURATION

Transit Clause

8. Subject to Clause 11 below, this insurance attaches from the time the subject-matter insured is first moved in the warehouse or at
8.1 the place of storage (at the place named in the contract of insurance) for the purpose of the immediate loading into or onto the carrying vehicle or other conveyance for the commencement of transit,
continues during the ordinary course of transit
and terminates either

8.1.1 on completion of unloading from the carrying vehicle or other conveyance in or at the final warehouse or place of storage at the destination named in the contract of insurance,

8.1.2 on completion of unloading from the carrying vehicle or other conveyance in or at any other warehouse or place of storage, whether prior to or at the destination named in the contract of insurance, which the Assured or their employees elect to use either for storage other than in the ordinary course of transit or for allocation or distribution, or

8.1.3 when the Assured or their employees elect to use any carrying vehicle or other conveyance or any container for storage other than in the ordinary course of transit or

8.1.4 on the expiry of 60 days after completion of discharge overside of the subject-matter insured from the oversea vessel at the final port of discharge,
whichever shall first occur.

8.2 If, after discharge overside from the oversea vessel at the final port of discharge, but prior to termination of this insurance, the subject-matter insured is to be forwarded to a destination other than that to which it is insured, this insurance, whilst remaining subject to termination as provided in Clauses 8.1.1 to 8.1.4, shall not extend beyond the time the subject-matter insured is first moved for the purpose of the commencement of transit to such other destination.

8.3 This insurance shall remain in force (subject to termination as provided for in Clauses 8.1.1 to 8.1.4 above and to the provisions of Clause 9 below) during delay beyond the control of the Assured, any deviation, forced discharge, reshipment or transhipment and during any variation of the adventure arising from the exercise of a liberty granted to carriers under the contract of carriage.

Termination of Contract of Carriage

9. If owing to circumstances beyond the control of the Assured either the contract of carriage is terminated at a port or place other than the destination named therein or the transit is otherwise terminated before unloading of the subject-matter insured as provided for in Clause 8 above, then this insurance shall also terminate unless prompt notice is given to the Insurers and continuation of cover is requested when this insurance shall remain in force, subject to an additional premium if required by the Insurers, either

9.1 until the subject-matter insured is sold and delivered at such port or place, or, unless otherwise specially agreed, until the expiry of 60 days after arrival of the subject-matter insured at such port or place, whichever shall first occur,
or

9.2 if the subject-matter insured is forwarded within the said period of 60 days (or any agreed extension thereof) to the destination named in the contract of insurance or to any other destination, until terminated in accordance with the provisions of Clause 8 above.

Change of Voyage

10. Where, after attachment of this insurance, the destination is changed by the Assured, this must be notified promptly to Insurers for
10.1 rates and terms to be agreed. Should a loss occur prior to such agreement being obtained cover may be provided but only if cover would have been available at a reasonable commercial market rate on reasonable market terms.

10.2 Where the subject-matter insured commences the transit contemplated by this insurance (in accordance with Clause 8.1), but, without the knowledge of the Assured or their employees the ship sails for another destination, this insurance will nevertheless be deemed to have attached at commencement of such transit.

CLAIMS

Insurable Interest

11. 11.1 In order to recover under this insurance the Assured must have an insurable interest in the subject matter insured at the time of the loss.

11.2 Subject to Clause 11.1 above, the Assured shall be entitled to recover for insured loss occurring during the period covered by this insurance, notwithstanding that the loss occurred before the contract of insurance was concluded, unless the Assured were aware of the loss and the Insurers were not.

Forwarding Charges

12. Where, as a result of the operation of a risk covered by this insurance, the insured transit is terminated at a port or place other than that to which the subject-matter insured is covered under this insurance, the Insurers will reimburse the Assured for any extra charges properly and reasonably incurred in unloading storing and forwarding the subject-matter insured to the destination to which it is insured.
This Clause 12, which does not apply to general average or salvage charges, shall be subject to the exclusions contained in Clauses 4, 5, 6 and 7 above, and shall not include charges arising from the fault negligence insolvency or financial default of the Assured or their employees.

Constructive Total Loss

13. No claim for Constructive Total Loss shall be recoverable hereunder unless the subject-matter insured is reasonably abandoned either on account of its actual total loss appearing to be unavoidable or because the cost of recovering, reconditioning and forwarding the subject-matter insured to the destination to which it is insured would exceed its value on arrival.

Increased Value

14. If any Increased Value insurance is effected by the Assured on the subject-matter insured under this insurance the agreed value of
14.1 the subject-matter insured shall be deemed to be increased to the total amount insured under this insurance and all Increased Value insurances covering the loss, and liability under this insurance shall be in such proportion as the sum insured under this insurance bears to such total amount insured.
In the event of claim the Assured shall provide the Insurers with evidence of the amounts insured under all other insurances.

14.2 Where this insurance is on Increased Value the following clause shall apply:
The agreed value of the subject-matter insured shall be deemed to be equal to the total amount insured under the primary insurance and all Increased Value insurances covering the loss and effected on the subject-matter insured by the Assured, and liability under this insurance shall be in such proportion as the sum insured under this insurance bears to such total amount insured.
In the event of claim the Assured shall provide the Insurers with evidence of the amounts insured under all other insurances.

BENEFIT OF INSURANCE

15. This insurance
15.1 covers the Assured which includes the person claiming indemnity either as the person by or on whose behalf the contract of insurance was effected or as an assignee,

15.2 shall not extend to or otherwise benefit the carrier or other bailee.

MINIMISING LOSSES

Duty of Assured

16. It is the duty of the Assured and their employees and agents in respect of loss recoverable hereunder
16.1 to take such measures as may be reasonable for the purpose of averting or minimising such loss, and
16.2 to ensure that all rights against carriers, bailees or other third parties are properly preserved and exercised and the Underwriters will, in addition to any loss recoverable hereunder, reimburse the Assured for any charges properly and reasonably incurred in pursuance of these duties.

Waiver

17. Measures taken by the Assured or the Insurers with the object of saving, protecting or recovering the subject matter insured shall not be considered as a waiver or acceptance of abandonment or otherwise prejudice the rights of either party.

AVOIDANCE OF DELAY

18. It is a condition of this insurance that the Assured shall act with reasonable despatch in all circumstances within their control.

LAW AND PRACTICE

19. This insurance is subject to English law and practice.

NOTE:- *Where a continuation of cover is requested under Clause 9, or a change of destination is notified under Clause 10, there is an obligation to give prompt notice to the Insurers and the right to such cover is dependent upon compliance with this obligation.*

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01/01/2009
2010

INLAND TRANSIT (RAIL/ROAD/AIR) CLAUSE - A (ALL RISKS)

RISKS COVERED

1 This insurance covers all risks of loss or damage to the subject-matter insured except as excluded by the provisions of Clauses Nos. 2,3,4 & 5 below.

EXCLUSIONS

2 In no case shall this insurance cover

2.1 loss damage or expense attributable to wilful misconduct of the Assured.
2.2 ordinary leakage ,ordinary loss in weight or volume or ordinary wear and tear of the subject-matter insured.
2.3 loss damage or expense caused by insufficiency or unsuitability of packing or preparation of the subject-matter insured to withstand the ordinary incidents of the insured transit where such packing or preparation is carried out by the Assured or their employees or prior to the attachment of this insurance (for the purpose of these clauses "packing" shall be deemed to include stowage in a container and "employees" shall not include independent contractors)
2.4 loss damage or expense proximately caused by delay even though the delay be caused by a risk insured against
2.5 loss damage or expense caused by inherent vice or nature of the subject-matter insured
2.6 loss damage or expence directly and indirectly caused by or arising from the use any weapon or device employing atomic or nuclear fission and/or fusion or other reaction or radioactive force or matter

3. In no case shall this insurance cover loss damage or expense arising from
3.1 Unfitness of container or land and/or rail conveyance and/or air conveyance for the safe carriage of the subject matter insured, where loading therein or thereon is carried out
Prior to attachment of this insurance or
By the Assured or their employees and they are privy to such unfitness at that time of loading

4. In no case shall this insurance cover loss damage or expense caused by
4.1 war civil war revolution rebellion insurrection, or civil strife arising there from or any hostile act by or against a belligerent power.
4.2 capture seizure arrest restraint or detainment and the consequences there of any attempt there at
4.3 derelict mines' bombs or other derelict weapons of war.

5. In no case shall this insurance cover loss damage or expense
5.1 caused by strikers. locked out workmen or persons taking part in labour disturbances, riots or civil commotions.
5.2 resulting from strikers, lock outs, labour disturbance riots or civil commotions.
5.3 caused by any act/s of terrorism being act/s of any person/s acting on behalf of, or in connection with, any organization/s which carries/carry out activities directed towards the overthrowing or influencing, by force or violence, of any goverment whether or not legally constitutedÂ
5.4 caused by any person/s acting from a political, ideological or religious motive.
5.5 caused by the intervention of government authorities (for e.g. Armed & Paramilitary forces, Police forces, Fire brigade, etc.) in connection with curbing and stopping what are excluded vide Clauses 5.1 to 5.4

DURATION

6. 6.1 Subject to clause 7 below, this insurance attaches from the time the subject matter insured is first moved in the warehouse or at the place of storage (at the place named in the contract of insurance) for the purpose of the immediate loading into or onto the carrying vehicle or other conveyance "or from the time the courier collects the subject matter insured and Courier Receipt (s) thereof duly issued' for the commencement of transit and continues during the ordinary course of transit including customary transhipment, if any, and terminates either
6.1.1 on completion of unloading from the carrying vehicle or other conveyance in or at the final warehouse or place of storage at the destination named in the contract of insurance, or
6.1.2 on completion of unloading from the carrying vehicle or other conveyance in or at any other warehouse or place of storage,

whether prior to or at the destination named in the contract of insurance , which the Assured or their employees elect to use either for storage other than in the ordinary course of transit or for allocation or distribution, or

6.1.3 when the Assured or their employees elect to use any carrying vehicle or other conveyance or any container for storage other than in the ordinary course of transit or

6.1.4 in respect of transits by Rail only or Rail and Road, until expiry of 7 days after arrival of the railway wagon at the final destination railway station, or

6.1.5 in respect of transit by Road only until expiry of 7 days after arrival of the vehicle at the destination town named in the policy

6.1.6 in respect of transit by Air only until expiry of 7 days after unloading the subject- matter insured from the aircraft at the final place of discharge.

6.1.7 until delivery to the consignee at destination by the courier or on expiry of 7 days after the date of arrival of the subject matter at the destination town named in the policy.

whichever shall first occur

N.B 1. The period of 7 days referred to above shall be reckoned from the midnight of the day of arrival of railway wagon at the destination railway station or vehicle at the destination town named in the policy

2. Transit by Rail only shall include incidental transit by Road performed by Railway Authorities to or from Railway out Agency.

3. Transit by Air shall include incidental transit by Road performed by Railway Authorities to or from Railway out Agency.

6.2 This insurance shall remain in force (subject to termination as provided for in clauses 6.1.1. to 6.1.4 above) during delay beyond the control of the Assured, any deviation and forced delivery and during any variation of the transit arising out of/from the exercise of a liberty granted to carriers under the contract of affreightment.

CLAIMS

7. 7.1 In order to recover under this insurance the Assured must have an insurable interest in the subject matter insured at the time of loss.

7.2 Subject to 7.1 above the Assured shall be entitled to recover for insured loss occurring during the period covered by this insurance, notwithstanding that the loss occurred before the contract of insurance was concluded unless the Assured were aware of the loss and the underwriters were not.

BENEFIT OF INSURANCE

8. This insurance

8.1 covers the Assured which includes the person claiming indemnity either as the person by or on whose behalf the contract of insurance was effected or as an assignee

8.2 shall not extend to or otherwise benefit the carrier or other bailees.

MINIMIZING LOSSES

9. It is the duty of Assured and their servants and agents in respect of loss recoverable hereunder.

9.1 to take such measures as may be reasonable for the purpose or averting or minimizing such loss and.

9.2 To ensure that all rights against carriers , bailees or other third parties are properly preserved and exercised by immediately lodging a monetary claim against railway/road carriers/bailees within six months from the date of railway/lorry receipt or as prescribed by the relavant statute

and the underwriters will , in addition to any loss recoverable hereunder, reimburse the Assured for any charges properly and reasonably incurred in pursuance of these duties.

10 .Measures taken by the Assured or the insurers with the object of saving, protecting or recovering the subject-matter insured shall not be considered as a waiver or acceptance of abandonment or otherwise prejudice the rights of either party.

AVOIDANCE OF DELAY

11. It is a condition of this insurance that the assured shall act with reasonable dispatch in all circumstances within their control.

LAW AND PRACTICE

12. This insurance is subject to Indian law & practice.

2010

"STRIKES RIOT AND CIVIL COMMOTIONS CLAUSE"

(Inland Transit(including Air and Courier)not in conjunction with Ocean Going Voyage)

RISKS COVERED

1. Subject otherwise to the terms, conditions and warranties of the policy on goods against transit risks, this Insurance covers, except as provided in Clause 2 below, loss of or damage to the subject-matter insured caused by:

1.1 strikes, Locked-out workmen, or persons taking part in labour disturbances riots or civil commotions,

1.2 any act/s of terrorism being an act/s of any person/s acting on behalf of, or in connection with, any organization/s which carries/carry out activities directed towards the overthrowing or influencing, by force or violence, of any goverment whether or not legally constituted

1.3 caused by any person/s acting from a political, ideological or religious motive.

1.4 caused by the intervention of government authorities (for e.g. Armed & Paramilitary forces, Police forces, Fire brigade, etc.) in connection with curbing and stopping what are covered by Clauses 1.1 to 1.3 above;

EXCLUSIONS

2. In no case shall this insurance cover :

2.1.loss damage or expense proximately caused by delay, inherent vice or nature of the subject-matter insured

2.2 loss damage or expense proximately caused by the absence, shortage or withholding of labour of any description whatsoever during any strike, lock-out, labour disturbances riot or civil commotion
2.3 any claim for expenses arising from delay or other consequential or indirect loss or damage of any kind
2.4 loss or damage or expense caused by hostilities, warlike operations, civil war, revolution, rebellion, insurrection or civil strife arising therefrom, or any hostile act by or against a belligerent power.

LAW AND PRACTICE

3. This insurence is subject to Indian law & practice.

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13.4.92 **INSTITUTE CLASSIFICATION CLAUSE**

The marine transit rates agreed for this insurance apply only to cargoes and/or interests carried by mechanically self-propelled vessels of steel construction, classed as below by one of the following classification societies:

Lloyd's Register	100A1 or B.S.
American Bureau of Shipping	✠A1
Bureau Veritas	1 3/3 E ✠
China Classification Society	★CSA
Germanischer Lloyd	✠100 A5
Korean Register of Shipping	✠ KRS 1
Maritime Register of Shipping	KM ★
Nippon Kaiji Kyokai	NS ✠
Norske Veritas	✠ 1A1
Registro Italiano	★ 100-A-1.1.

Provided such Vessels are:
a) (i) not bulk and/or combination carriers over 10 years of age;
(ii)not mineral oil tankers exceeding 50,000 GRT which are over 10 years of age.
b) (i) not over 15 years of age; OR
(ii) over 15 years of age but not over 25 years of age and have established and maintained a regular pattern of trading on an advertised schedule to load and unload at specified ports.

CHARTERED VESSELS AND ALSO VESSELS UNDER 1000 G.R.T. WHICH ARE MECHANICALLY SELF-PROPELLED AND OF STEEL CONSTRUCTION MUST BE CLASSED AS ABOVE AND NOT OVER THE AGE LIMITATIONS SPECIFIED ABOVE.

THE REQUIREMENTS OF THE INSTITUTE CLASSIFICATION CLAUSE DO NOT APPLY TO ANY CRAFT, RAFT OR LIGHTER, USED TO LOAD OR UNLOAD THE VESSEL, WHILST THEY ARE WITHIN THE PORT AREA.

CARGOES AND/OR INTERESTS CARRIED BY MECHANICALLY SELF-PROPELLED VESSELS NOT FALLING WITHIN THE SCOPE OF THE ABOVE ARE HELD COVERED SUBJECT TO A PREMIUM AND ON CONDITIONS TO BE AGREED.

SAILING VESSELS CLAUSE

RISKS COVERED

1 This insurance covers as in A or B or C below except as provided in clauses 2,3,4, and 5

A Total and/or Constructive Total loss of the subject matter insured due to total loss and/or constructive total loss of the vessel only.

OR

B Loss of or damage to the subject matter insured reasonably attributable to

1
1.1 Vessel being burnt
1.2 Vessel being sunk

2 Loss of the subject matter insured caused by jettison if necessitated by stress of weather only.

C Loss of or damage to the subject matter insured reasonably attributable to

1
1.1 Vessel being burnt
1.2 Vessel being stranded or sunk

2 loss of the subject matter insured caused by jettison due to stress of weather, stranding , sinking or burning or collisions at sea.

Note : Delete the risks not applicable.

EXCLUSIONS

2

In no case shall this insurance cover.

2.1 General average contribution

2.2

Loss damage or expense willfully caused by o due to unlawful conduct or negligence or misbehaviour on the part of the tindal or the crews or the owner of the craft or shippers or consignees.

2.3

Loss damage or expense arising out of detention, seizure or any act or acts of any Government in consequence of the vessel being engaged in illicit or contraband trade.

2.4

Ordinary leakage, ordinary loss in weight or volume or ordinary wear and tear of the subject matter insured.

2.5

Loss damage or expense caused by insufficiency or unsuitability of packing or preparation of the subject matter insured (for the purpose of this Clause 2.5 "packing" shall be deemed to include stowage in a container or liftvan but only when such stowage is carried out prior to attachment of this insurance or by the Assured or their servants).

2.6

Loss damage or expense caused by inherent vice or nature of the subject matter insured.

2.7

Loss damage or expense proximately caused by delay, even though the delay be caused by a risk insured against.

2.8

Loss damage or expense arising from insolvency or financial default of the owners managers charterers or operators of the vessel.

2.9

Loss damage or expense arising from the use of any weapon of war employing atomic or nuclear fission and/or fusion or other like reaction or radioactive force or matter.

3 3.1

In no case shall this insurance cover loss damage or expense arising from unseaworthiness or unfitness of vessel container or liftvan for the safe carriage of the subject matter insured, where the Assured or their servants are privy to such unseaworthiness or unfitness, at the time the subject matter insured is loaded therein.

3.2

The underwriters waive any breach of the implied warranties of seaworthiness of the ship and fitness of the ship to carry the subject matter insured to destination, unless the Assured or their servants are privy to such unseaworthiness or unfitness.

4

In no case shall this insurance cover loss damage or expense

4.1

War civil war revolution rebellion insurrection, or civil strife arising therefrom, or any hostile act by or against a belligerent power.

4.2

Capture seizure arrest restraint or detainment and the consequences thereof any attempt thereat.

4.3

Derelict mines torpedoes bombs or other derelict weapons of war.

5

In no case shall this insurance cover loss damage or expense.

5.1

Caused by strikers, locked out workmen, or persons taking part in labour disturbances, riots or civil commotions.

5.2

Resulting from strikes, lock-outs, labour disturbances, riots or civil commotions.

5.3

Caused by any terrorist or any person acting from a political motive.

TIME BAR

6

In no case shall this insurance cover loss damage or expense after the expiration of 12 months from the date of occurrence of the loss or damage unless the claim is the subject matter of a pending suit/action.

DURATION

7

This insurance attaches from the time the cargo insured is loaded on the vessel at the port named in the policy and continues during the ordinary course of voyage and ceases on landing of the cargo or eight days after arrival of the vessel at the final port of discharge named in the policy, whichever is earlier.

8

In the event of the vessel carrying the cargo insured being forced to take shelter in any port other that the port of destination mentioned in the policy due to accident or mishap of stress of weather and discharges the cargo at such port or the cargo is transhipped into another vessel, the insurance hereunder shall cease from the time the cargo is discharged overside the vessel. In the event of the cargo remaining in the vessel and the voyage not being abandoned, the cover shall continue for a period of 30 days from the time the vessel takes shelter.

CLAIMS

9 9.1

In order to recover under this insurance the Assured must have an insurable interest in the subject matter insured at the time of the loss.

9.2
subject to 9.1 above, the Assured shall be entitled to recover for insured loss occurring during the period covered by this insurance, notwithstanding that the loss occurred before the contract of insurance was concluded, unless the Assured were aware of the loss and the Underwriters were not.

BENEFIT OF INSURANCE

10
This insurance shall not inure to the benefit of the carrier or other bailee.

MINIMISING LOSSES

11
It is the duty of the Assured and their servants and agents in respect of loss recoverable hereunder.

11.1
to take such measures as may be reasonable for the purpose of averting or minimizing such loss, and

11.2
to ensure that all rights against carriers, bailees or other third parties are properly preserved and exercised.
And the underwriters will , in addition to any loss recoverable hereunder, reimburse the assured for any charges properly and reasonably incurred in pursuance of these duties.

12
Measures taken by the Assured or the Underwriters with the object of saving, protecting or recovering the subject matter insured shall not be considered as a waiver or acceptance of abandonment or otherwise prejudice the rights of either party.

AVOIDANCE OF DELAY

13
It is a condition of this insurance that the Assured shall act with reasonable despatch in all circumstances within their control.

1.11.82 INSTITUTE WAR CANCELLATION CLAUSE (CARGO)

The cover against war risks (as defined in the relevant Institute War /clauses) may be cancelled by either the Underwriters or the Assured except in respect of any insurance which shall have attached in accordance with the condition of the Institute War Clauses before the cancellation becomes effective. Such cancellation shall however only become effective on the expiry of 7 days from midnight of the day on which notice of the cancellation is issued by or to the underwriters.

UNITED INDIA INSURANCE CO. LTD.
DIVISIONAL OFFICE 10
Vulcan Insurance Building, Ground Floor, Veer Nariman Road
Mumbai 400020

ATTACHED TO AND FORMING PART OF POLICY NO.- 0210002123P114098172

CARGO WARRANTIES:

It is warranted that

1. Warranted cargo conveyance to be fit and suitable for the intended cargo and the intended journey
2. Liability to be restricted to the Permissible Registered laden weight of the carrying vehicle. However, in case of loss / damage due to Overloading, policy will not respond
3. Warranted that goods are transported in closed wagons and/or trucks to be covered with tarpaulin or any other waterproof material to avoid ingress of water.
4. Warranted for imported cargo where the responsibility of insurance attaches to the insured after arrival &/ or discharge of cargo over side the vessel, such additional transit shall be covered on ITC 'A' and SRCC terms (tail end transits) only if pre-dispatch survey is carried out, otherwise cover will be as per ITC B
5. Warranted all chemical cargo transported, to comply with rules, recommendations and guidelines of latest International Maritime Dangerous Goods Code and also as per any local regulations pertaining to transportation of hazardous goods by road.
6. Warranted in case of rough weather warning all due diligence measures taken.

Exclusions:

1 Unexplained shortages / rejections and trade losses / quality losses.
2 Unexplained shortages / losses, shortages from seal intact containers / sound packages are excluded from the scope of the policy.
3 Excluding mould mildew fungus vermin moth condensation insect infestation stains moisture unless caused by ICC B / ITC B perils.
4 Losses due to heating / sweating / Contamination / adulteration / deterioration of quality unless caused by ICC B / ITC B perils.
5 Rusting/ Oxidation / Discolouration unless caused by external accidental,

physical and visible means.
6 Losses due to electrical / electronic / mechanical dearrangement unless caused by external accidental physical and visible means.
7 Losses due to breaking bending denting chipping chafing marring scratching or crushing unless caused by external accidental physical and visible means.

Subject to conditions:

1 Institute Radioactive Contamination Exclusion Clauses (Sea)10-11-03
2 Institute Chemical, Biological, Biochemical Electromagnetic Weapons and Cyber-attack Exclusion Clause
3 Cargo Termination of storage in Transit Clause
4 Termination of Transit Clause (Terrorism)
5 Inland Transit (Rail or Road) A-All risks - 2010
6 Inland Transit (Rail or Road) B-Basic risks - 2010
7 Strike Riots civil commotion Clause - 2010
8 Institute War Cancellation Clause
9 Institute Strike Cancellation Clause
10 Communicable Disease Exclusion Clause J 2020-007A
11 **Sanction Limitation & Exclusion clause**
12 **Specified territory exclusion Clause**

Over Dimensional cargo is covered subject to the below given warranty:

1 In case of ODC: Warranted loading unloading fastening lashing and barging (if any) crane suitability truck/trailer capability and the entire operation of logistics including deck stowing to be supervised by IRDA approved surveyor at assured's cost and the recommendations of such surveyor be complied with.
2 Route survey to be done in cases of ODC
ODC Definition: 1) Any Cargo which including packing has dimensions in excess of 12 Meters length and/or 2.5 Meters wide and/or 2.5 Meters high [or US equivalent] and therefore does not fit inside a standard 40-foot container or equivalent road trailer. 2) Any Cargo including packing with a weight in excess of 30 Metric Tonnes.

Authorised Signatory

UNITED INDIA INSURANCE COMPANY LIMITED

RECEIPT

Issuing Office code/Address :	021000 / DO 10 MUMBAI VULCAN INSURANCE BUILDING, 77, GROUND FLOOR, VEER NARIMAN ROAD, CHURCHGATE, MUMBAI400020	Receipt Number :	10102100023115877224
		Collection Date :	29/01/2024

Received with thanks from M/S MANGALORE REFINERY AND PETROCHEMICALS LIMITED (Customer ID : 23024237007, Customer GST/UIN No :29AAACM5132A1ZZ) a sum of Rs. 371701.00(Three lakhs seventy-one thousand seven hundred one rupees only) as per detail given hereunder:

SL No	Policy Number	Policy Type	Endt/Ren/Clm/Decln No	Particulars	Total Amount
1	0210002123P114098172	MarineOpenPolicy	0	Final Premium	3,15,000.00
2	0210002123P114098172	MarineOpenPolicy	0	IGST	56,700.00
				Total (Rounded Off) :	**3,71,700.00**
				Stamp Duty :	**1.00**
				Bank Charges :	**0.00**
				Total Amount :	**3,71,701.00**

CD Details

SL No	CD Account Number	CD Account Holder ID	CD Account Holder Name	Tagged Amount
1	C100025594	23024237007	M/S MANGALORE REFINERY AND PETROCHEMICALS LIMITED	3,71,701.00

Particulars :

GSTIN (UIIC) : 27AAACU5552C1ZJ

for UNITED INDIA INSURANCE COMPANY LIMITED

AUTHORISED SIGNATORY

Cashier Initial

Note:

1. Receipt valid subject to realisation of cheque
2. Please quote policy no., collection no., and date in all correspondences.

ANNEXURE –XIII

TO

SPECIAL PURCHASE CONDITIONS

VULNERABILITY ATLAS OF INDIA

Vulnerability Atlas of India.

Vulnerability Atlas of India (VAI) is a comprehensive document which provides existing hazard scenario for the entire country and presents the digitized State/UT-wise hazard, maps with respect to earthquakes, winds and floods for district-wise identification of vulnerable areas. It also includes additional digitized maps for thunderstorms, cyclones and landslides. The main purpose of this Atlas is its use for disaster preparedness and mitigation at policy planning and project formulation stage.

This Atlas is one of its kind single point source for the various stakeholders including policy makers, administrators, municipal commissioners, urban managers, engineers, architects, planners, public etc. to ascertain proneness of any city/location/site to multi-hazard which includes earthquakes, winds, floods, thunderstorms, cyclones and landslides. While project formulation, approvals and implementation of various urban housing, buildings and infrastructures schemes, this Atlas provides necessary information for risk analysis and hazard assessment.

The Vulnerability Atlas of India has been prepared by Building Materials and Technology Promotion Council under Ministry of Housing and Urban Affairs, Government of India and available at their website www.bmtpc.org.

It is mandatory for the bidders to refer Vulnerability Atlas of India for multi-hazard risk assessment and include the relevant hazard proneness specific to project location while planning and designing the project in terms of:

i) Seismic zone (II of V) for earthquakes
ii) Wind velocity (Basic Wind Velocity: 55, 50, 47, 44, 39 & 33 m/s)
iii) Area liable to floods and Probable max. surge height
iv) Thunderstorms history
v) Number of cyclonic storms / severe cyclonic storms and max sustained wind specific to coastal region
vi) Landslides incidences with Annual rainfall normal
vii) District wise Probable Max. Precipitation.

ENGINEERS INDIA LIMITED

GENERAL PURCHASE CONDITIONS
(INDIGENOUS)

Regd. Office : Engineers India Bhawan, 1, Bhikaiji Cama Place, New Delhi - 110066

INDEX

1.0 DEFINITIONS

1.1 The following expressions used in these General Purchase Conditions (GPC) and the Purchase shall have the meaning indicated against each of these:

The **PURCHASER / OWNER** means Engineers India Limited, a company incorporated in India having its registered office at Engineers India Bhawan, 1, BhikaijiCama Place, RK Puram, New Delhi-110066 and shall include its successors and assignees.

"GOODS/MATERIALS": Goods and/or materials shall mean any of the Articles, Materials, Machinery, Equipment, Supplies, Drawings, Data and other property and all services including but not limited to design, delivery, installation, inspection, testing and commissioning specified to complete the order.

"SELLER": Seller shall mean the Person, Firm or Corporation to whom the Fax of Acceptance / Purchase Order is issued.

"Purchase Order": **Purchase Order**shall mean the Order placed on the Seller for supply of material/services and shall include the general conditions, bidding conditions, specific conditions, material requisition/Purchase requisition, drawings, Price schedule and subsequent amendments mutually agreed upon. It may also be referred as **order** or **contract.**

Contractual Delivery Date": Contractual Delivery Date is the date on which goods shall be delivered F.O.T dispatching point/destination in accordance with the terms of the Purchase Order. The contractual delivery date/period is inclusive of all the lead time for engineering, procurement of raw materials, manufacturing, inspection, testing packing and any other activities whatsoever required to be accomplished for effecting the delivery at the agreed delivery point.

"Procurement co-coordinators / Managers": Purchaser's authorized representative appointed as procurement coordinators / manager.

"INSPECTORS": Inspectors deputed / authorized by Purchaser including Third Party Inspection Agency.

CLIENT: Client means Project Owner.

2.0 REFERENCE FOR DOCUMENTATION

2.1 Purchase Order / Purchase Requisition number must appear on order confirmation, correspondence, drawings, and invoices, shipping notes, packing and / or any documents or paper connected with the Order.

3.0 CONFIRMATION OF ORDER

3.1 The Seller shall acknowledge the receipt of the Fax of Acceptance (FOA) / Purchase Order (PO) within seven days following the date of the FOA / Purchase Order and shall thereby confirm his acceptance of the FOA / Purchase Order without any exceptions. This acknowledgment will bear on both FOA / Purchase Order and General Purchase Conditions.

4.0 SALES CONDITIONS

4.1 With Seller's acceptance of provision of the Purchase Order, he waives and considers as

cancelled any of his general sales conditions.

5.0 COMPLETE AGREEMENT

5.1 The terms and conditions of the Purchase Order shall constitute the entire Agreement between the parties hereto. Changes will be binding only if the amendments are made in writing and signed by an authorized representative of the Purchaser.

6.0 INSPECTION-CHECKING-TESTING

6.1 The equipment, materials and workmanship covered by the Purchase Order are subject to inspection and testing at any time prior to shipment and/or despatch and to final inspection within a reasonable time after arrival at the place of delivery. Inspectors shall have the right to carry out the inspection and testing which will include the raw materials at manufacturer's shop, at fabricator's shop and at the time of actual despatch before and after completion of packing.

6.2 All tests, mechanical and others as specified in the Purchase Requisition and particularly those required by codes will be performed at Seller's expenses and in accordance with Inspector's instructions. The Seller will also bear the expenses concerning preparation and rendering of tests required by Boiler Inspectorate or such other statutory testing agencies or by Lloyds Register of Shipping and Industrial Services as may be required.

6.3 The salaries and fees of Inspectors and their travelling, lodging and boarding expenses will not be borne by the Seller unless inspection becomes anfractuous due to any omission or commission on the part of the Seller. Before shipping or despatch, the equipment and/or materials will have to be checked and stamped by Inspectors who are authorized also to forbid the use and despatch of any equipment and/or materials which during tests and inspection fail to comply with the specification, codes and testing requirements.

6.4 The Seller shall:

a) Inform Procurement Coordinator/Managers at least eight days in advance of the exact place, date and time of rendering the equipment or materials for required inspection.

b) Provide free access as required to Inspectors during normal and / or extended working hours to Seller's or his/its sub-Supplier's works and place at their disposal all useful means of performing, checking, marking, testing, inspection and final stamping.

6.5 Even if the Inspections and tests are fully carried out, Seller would not be absolved to any degree from his responsibilities to ensure that all equipment and material supplied comply strictly with requirements as per agreement both during manufacturing, at the time of delivery, inspection, on arrival at site and after its erection or start-up and guarantee period as stipulated in Clause 22 (GUARANTEE).

6.6 The Seller's responsibility will not be lessened to any degree due to any comments made by Procurement Coordinators/Managers and Inspectors on the Seller's drawings or specifications or by inspectors witnessing any chemical or physical tests. In any case, the equipment must be in strict accordance with the Purchase Order and/or its attachments failing which the Purchaser shall have the right to reject the goods and hold the Seller liable for non-performance of contract.

7.0 OFFICIAL INSTITUTIONAL TESTING

7.1 In addition to testing and inspection by Inspectors mentioned above, Lloyds register Industrial services or similar institutional agencies like Boiler-Inspectorate may be

assigned for official testing of all coded equipment. The Seller shall ensure that all Procedures for preparation and Performance of test prescribed by such institution shall be complied scrupulously.

7.2 The Seller is required to send to such institutions as may be designed by the Purchaser at least three sets of fabricated / manufactured drawings for each equipment and calculations. All manufacturer's mill test certificates and analytical reports from material laboratories in respect of all raw material and components employed shall have to be presented to such Institution's Inspectors in the number of copies required. Seller shall be responsible for any delay in submission of necessary certificates. The Seller shall maintain close liaison with procurement co-ordinators and Institution's Inspectors to maintain Schedule and delay, if any, in this process will not be taken into consideration as a cause of Force Majeure.

8.0 TRANSIT RISK INSURANCE

8.1 The Purchaser against its/ Client's Open General Policy (The name of the Insurance Co. will be conveyed subsequently) shall cover transit Risk Insurance. The Seller shall advise the dispatch particulars to the Insurance Company under advice to the Procurement Coordinators / Managers before shipment.

9.0 DELIVERY DATES

9.1 Time of delivery as mentioned in the Purchase Order shall be the essence of the agreement and no variation shall be permitted except with prior authorization in writing from the Purchaser. Goods should be delivered securely packed and in good order and condition at the place and within the time specified in the Purchase Order for their delivery. The Purchaser reserves the right to defer the period of delivery in writing.

10.0 DELAYED DELIVERY

10.1 The time and date of delivery of materials/ equipment as stipulated in the Purchase Order shall be deemed to be the essence of the agreement. For any delay in delivery of equipment / materials or part thereof beyond the delivery date stipulated, the Purchaser may:

a) **FOR BUILK ITEMS**: Accept delayed delivery at prices reduced by a sum equivalent to one half of one percent (1/2%) of the total value of delayed item/quantity for every week of delay or part thereof, limited to a maximum of five percent (5%) of the total order value.

b) **FOR ITEMS OTHER THAN BULK ITEMS(WITH OR WITHOUT SITE WORK)**: Accept delayed delivery at prices reduced by a sum equivalent to one half of one percent (1/2%) of the total order value for every week of delay or part thereof, limited to a maximum of five percent (5%) of the total order value.

10.2 The invoice shall be raised after equivalent reduction in the Invoice value before presenting to Purchaser/ Bank for payment. The acceptance of delayed delivery is without prejudice to Purchaser's right of cancelling the purchase order wholly or in part for any delay exceeding the period of maximum price reduction and the Seller shall be liable for all consequences thereof.

11.0 DELAYS DUE TO FORCE MAJEURE

11.1 In the event of causes of Force Majeure occurring within the agreed delivery terms, the

delivery dates can be extended by the Purchaser on receipt of application from the Seller without imposition of price reduction. Only the following shall be considered as force majeure:

a) Act of terrorism;

b) Riot, war, invasion, act of foreign enemies, hostilities (whether war be declared or not), civil war, rebellion, revolution, insurrection of military or usurped power;

c) Ionizing, radiation or contamination, radio activity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel, radioactive toxic explosive or other hazardous properties of any explosive assembly or nuclear component;

d) Epidemics, earthquakes, flood, fire, hurricanes, typhoons or other physical natural disaster, but excluding weather conditions regardless of severity; and

e) Freight embargoes, strikes at national or state-wide level or industrial disputes at a national or state-wide level in any country where Works are performed, and which affect an essential portion of the Works but excluding any industrial dispute which is specific to the performance of the Purchase Order.

11.2 For the avoidance of doubt, inclement weather, third party breach, delay in supply of materials (other than due to a nationwide transporters' strike) or commercial hardship shall not constitute a Force Majeure event.

11.3 The Seller must advise the Purchaser by a registered letter duly certified by a statutory authorities, the beginning and the end of the delay immediately, but in no case later than 10 days of the beginning and end of each cause of Force Majeure condition as defined above.

11.4 The extension of time shall be the sole remedy of the Seller for any delay under this clause and the Seller shall not be entitled in addition to or in lieu of such extension to claim any damages or compensation on any account whatsoever whether under the law governing contracts or any other law in force, and the Seller hereby waives and disclaims any and all contrary rights.

11.5 In case force majeure conditions persists for period exceeding 02 (Two) Months, the Purchaser reserves the right to cancel the Purchase order or part of it.

12.0 REJECTION, REMOVAL OF REJECTED GOODS AND REPLACEMENT

12.1 In case the testing and inspection at any stage by Inspectors reveal that the equipment, material and workmanship do not comply with the specification and requirements, the Seller at his/its own expense and risk shall remove the same within the time allowed by the Purchaser. The Purchaser shall be at liberty to dispose of such rejected goods in such a manner, as he may think appropriate. In the event the Seller fails to remove the rejected goods within the period as aforesaid, all expenses incurred by the Purchaser for such disposal shall be to the account of the Seller. The freight paid by the Purchaser, if any, on the inward journey of the rejected materials shall be reimbursed by the Seller to the Purchaser before the rejected materials are removed by the Seller.

12.2 The Seller shall have to proceed with the replacement of that equipment or part of the equipment at Purchaser's stores / site, if so required by the Purchaser, without claiming any extra payment. The time taken for replacement in such event will not be added to the contractual delivery period.

12.3 Any rejection, removal of rejected goods/material and replacement shall be applicable

only up to guarantee period or extended guarantee period as applicable.

13.0 TRANSFER OF PROPERTY FROM THE SELLER TO THE PURCHASER

13.1 The transfer of property shall be deemed to have taken place as follows subject to the provisions herein contained:

a) F.O.T. despatch point: On handing over the equipment to the carrier against receipt and such receipt having been passed over to the Purchaser.
b) F.O.T. Project Site: on receipt of material at Project site.
c) Equipment sent freight/ carriage paid to the Refinery site: On receipt of goods at site.
d) Equipment erected by the Seller: on acceptance at job site.
e) Equipment commissioned by the Seller: On taking over by the Purchaser for regular operation after test run at maximum capacity for specified period satisfactorily performed.

However, where the sale to or purchase by the Seller is deemed to take place in the course of inter-state trade or commerce or by endorsement/transfer of Railway receipt or Truck/Lorry or any receipt during transit, the sale to the OWNER of the same material shall similarly be deemed to take place by endorsement/transfer during transit in the course of inter-state trade or commerce in respect of which the OWNER will furnish the Seller/Supplier, wherever applicable, Form “C” to qualify to concessional rate of tax.

14.0 PRICE

14.1 Unless otherwise agreed to in the terms of the Purchase Order, the price shall be:

a) Firm and not subject to escalation for any reasons whatsoever till the execution of entire order even though it might be necessary for the order execution to take longer than the delivery period specified in the order.
b) Inclusive of adequate road worthy packing and forwarding charges upto effecting delivery at F.O.T. despatch point in all cases whenever F.O.T destination delivery terms are agreed to but exclusive of transit insurance.

14.2 Exclusive of Central/State Sales Tax, Excise Duty and or such imposts which are leviable by law on sales of finished goods to Purchaser and/or Octroi duty, if any, leviable at destination/ project site. The nature and extent of such levies shall be shown separately.

15.0 TERMS OF PAYMENT

15.1 Payment terms shall be as specified in the Enquiry / Purchase Order.

16.0 RECOVERY OF SUMS DUE

16.1 Whenever any claim against the Seller for payment of sum of money arises out of or under the contract, the Purchaser shall be entitled to recover such sums from any sum then due or which at any time thereafter may become due from the Seller under this or any other contract with the Purchaser including right to en-cash the PBG. In the event of encashment of PBG, the same shall be re-stored to its original amount by the Seller and should this sum be not sufficient to cover the recoverable amount, the Seller shall pay to the Purchaser on demand the balance remaining due.

17.0 CHANGES

17.1 The Purchaser has the option at any time to make changes in quantities ordered or in specifications and drawings. If such changes cause an increase or decrease in the price or in the time required for supply, a claim under this provision must be raised by Seller with documentary evidence/back-up documents/calculations within 7 days from the date the intimation for change is received from Purchaser. Seller shall execute the change only after receipt of change order.

18.0 CANCELLATION

18.1 CANCELLATION FOR DEFAULT

18.1.1 The Purchaser reserves the right to cancel the Purchase Order or any part thereof and shall be entitled to rescind the Purchase Order wholly or in part by a written notice of 10 days to the Seller if:

a) The Seller fails to comply with the terms of the Purchase Order.

b) The Seller fails to adhere to delivery schedule of manufacturing and fails to deliver the goods on time and/or replace the rejected goods promptly.

c) The Seller becomes bankrupt or goes into liquidation.

d) The Seller makes a general assignment for the benefit of creditors.

e) A receiver is appointed for any of the property owned by the Seller.

18.1.2 Upon receipt of the said cancellation notice, the Seller shall discontinue all work on the Purchase Order and matters connected with it.

18.1.3 The Purchaser in that event will be entitled to procure the material in the open market and recover excess payment over the Seller's agreed price, if any, from the Seller reserving to itself the right to forfeit the /Contract Performance Bank Guarantee (CPBG), if any.

18.2 CANCELLATION FOR CONVENIENCE

18.2.1 The PURCHASER may, by written notice of 10 days sent to the SELLER, Cancel the CONTRACT, in whole or part, at any time for his convenience. The notice of cancellation shall specify that cancellation is for the PURCHASER's convenience, the extent to which performance of work under the CONTRACT is cancelled and the date upon which such cancellation becomes effective.

18.2.2 The GOODS that are complete and ready for shipment within 30 days after the SELLER's receipt of notice of cancellation shall be purchased by the PURCHASER at the CONTRACT terms and prices. For the remaining GOODS, the PURCHASER may opt:

a) to have any portion completed and delivered at the CONTRACT terms and prices, and /or

b) to cancel the remainder and pay to the SELLER an agreed amount for partially completed GOODS and for materials and parts previously procured by the SELLER.

19.0 PATENTS AND ROYALTIES

19.1 On acceptance of this order, the Seller will be deemed to have entirely indemnified the Purchaser and Procurement Coordinators/Managers from any legal action or claims

regarding compensation for breach of patent rights which the Seller deems necessary to apply for manufacturing the ordered equipment and/or materials or which can in any way be connected in the manufacture.

20.0 CONTROL REGUALTIONS

20.1 The supply, despatch and delivery of goods shall be arranged by the Seller in strict conformity with the statutory regulations including provision of Industries (Development and Regulation) Act, 1951 and any amendment thereof as applicable from time to time. The Purchaser disowns any responsibility for any irregularity or contravention of any of the statutory regulations in manufacture or supply of his stores covered by this order.

21.0 CONTRACT *CUM PERFORMANCE BANK GUARANTEE (CPBG)*

21.1 Within 30 days from the date of issue of Purchase order, the Seller shall furnish Contracts cum performance guarantee in the form of Bank Guarantee as per the purchaser's proforma for an amount equivalent to 10% of the order value. This shall be 5% in case of bulk items (as listed in Annexure 1 to GPC).

21.2 The proceeds of the CPBG shall be appropriated by the Purchaser as compensation for any loss resulting from the Seller's failure to complete his obligations under the Contract without prejudice to any of the rights or remedies the PURCHASER may be entitled to as per terms and conditions of CONTRACT.

21.3 This CPBG shall also govern the successful performance of Goods and Services during the entire period of Contractual Warrantee/Guarantee.

21.4 The CPBG shall be denominated in the currency of the CONTRACT.

21.5 The Contracts cum Performance Guarantee shall be valid for the duration of 2 months beyond the expiry of Warrantee/Guarantee period. The Bank Guarantee will be discharged by PURCHASER not later than 2 months from the date of expiration of the Seller's entire obligations, including any warrantee obligations, under the CONTRACT.

21.6 In case of Reinforcement Bar, Structural steel, CPBG will be required for 5% of order value having validity up to Contractual delivery period + 2 months claim period.

21.7 In case of limited enquiries, CPBG shall not be required for orders up to Rs. Twenty Five (25) Lakhs in case of Pipes, Fittings, Flanges, Gaskets and Fasteners and for orders up to Rs. Ten (10) Lakhs for all other items. However, in case of NIT, CPBG shall be required for all orders irrespective of order value.

21.8 Bank Guarantee(s) shall be issued through Indian Nationalized Bank/ Indian Scheduled bank (other than Co-operative Banks) / Indian branches of foreign banks registered with Reserve Bank of India as a scheduled foreign bank.

21.9 It will be the responsibility of the Seller to keep the Bank Guarantee fully subscribed. Any shortfall in the value of the Bank Guarantee as a result of encashment by the Purchaser either in full or in part in terms of Seller's Performance shall be replenished by the Seller within two weeks thereof.

22.0 GUARANTEE

22.1 The Seller shall guarantee that any and all materials used in execution of the Purchase Order shall be in strict compliance with characteristics, requirements and specifications and that the same shall be free from any defects. Checking of the Seller's drawings by the Purchaser/Purchaser's representatives and their approval and permission to ship or

despatch the equipment and materials granted by Inspectors shall not relieve the Seller from any part of his/its responsibilities of proper fulfilment of the requirements.

22.2 The Seller will guarantee that all materials and equipments shall be repaired or replaced as the case may be, at his own expense, in case the same have been found to be defective in respect of material, workmanship or smooth and rated operation within a period 15 months after the equipment/ material have been put in service or 30 months from the date of shipment, whichever is earlier. Repaired or replaced equipment/ materials shall be similarly guaranteed by the SELLER for a period of fifteen (15) months from the date of replacement/ repair subject to a maximum of 30 months from the date,the main equipment/ material have been put in service. All expenses for such replacement/ repair of equipment/ material shall be to the account of the Seller including freight, if any.

22.3 Acceptance by the Purchaser or its Inspectors of any equipment and materials or its replacement will not relieve the Seller of its responsibility of supplying the equipment/materials strictly according to the specification and according to the guarantees agreed by the Seller.

23.0 NON-WAIVER

23.1 Failure of the Purchaser / Procurement Coordinators/ Managers to insist upon any of the terms or conditions incorporated in the Purchase Order or failure or delay to exercise any rights or remedies herein or by law or failure to properly notify Seller in the event of breach, or the acceptance of or payment of any goods hereunder or approval of design shall not release the Seller and shall not be deemed a waiver of any right of the Purchaser / Procurement Coordinators/Managers to insist upon the strict performance thereof or any of his or their rights or remedies as to any such goods regardless of when goods are shipped received or accepted nor shall any purported oral modification or revisions of the order by Purchaser/ Procurement Coordinators/Managers act as waiver of the terms hereof.

24.0 NON ASSIGNMENT

24.1 The Seller without obtaining prior written consent of the Purchaser shall not assign the Purchase Order to any other agency.

25.0 SELLER'S DRAWING AND DATA REQUIREMENT

25.1 The Seller shall submit drawings, data and documentation in accordance with but not limited to what is specified in the requisition and/or in the Seller drawings and data form attached to the Purchase Requisition and as called for in Clause 26 *(*PROGRESS SCHEDULE & EXPEDITING). Types, quantities and time limits of submitting this must be respected in its entirety failing which the Purchase Order shall not be deemed to have been executed for all purposes including settlement of payment since the said submission is an integral part of Purchase Order execution.

26.0 TECHNICAL INFORMATION

26.1 Drawings, specifications and details shall be the property of the Purchaser and shall be returned by the Seller on demand. The Seller shall not make use of drawings and specifications for any purpose at any time save and except for the purpose of the Purchaser.

26.2 The Seller shall not disclose the technical information furnished to or gained by the Seller

under or by virtue of or as a result of the implementation of the Purchase Order to any person, firm or body or Corporate authority and shall make all endeavors to ensure that the technical information is kept CONFIDENTIAL. The technical information imparted and supplied to the Seller by the Purchaser shall at all times remain the absolute property of the Purchaser.

27.0 PROGRESS SCHEDULE & EXPEDITING

27.1 Template for progress reporting is available on EIL eDMS portal. SELLER within 2 weeks of award shall submit to PURCHASER, his Delivery schedule regarding the documentation, manufacture, testing, supply, erection and commissioning of the GOODS.

27.2 For items other than bulk, the Delivery schedule will be in the form of a network or a bar chart clearly indicating all main or key events regarding documentation, supply of raw materials, manufacturing, testing, delivery, erection and commissioning.

27.3 SELLER shall update the template online on monthly basis to keep PURCHASER updated on the progress of the execution of Order and achievement of targets set out in time bar chart.

27.4 The Procurement Co-coordinator/ Managers shall have the right to inspect SELLER's premises with a view to evaluating the actual progress of work on the basis of SELLER's Delivery schedule.

27.5 The Procurement Co-coordinator/ Managers shall have free access to Seller's shop and/or sub-Supplier's shop at any time and they shall be provided all the necessary assistance and information to help them perform their job.

27.6 Irrespective of such inspection, in case of any delay, Purchaser cannot be held responsible. However, if delay is expected, at the earliest possible date, SELLER shall advise Purchaser, of anticipated delay in the progress.

27.7 Notwithstanding the above, in case progress on the execution of order at various stages is not as per phased Delivery schedule and is not satisfactory in the opinion of the PURCHASER which shall be conclusive or SELLER shall neglect to execute the order with due diligence and expedition or shall contravene the provisions of the order, PURCHASER shall be entitled to take action in accordance with the provisions of the Order.

28.0 SELLER'S LIABILITIES

28.1 The Seller's workmen or employees shall under no circumstances be deemed to be in Purchaser's employment and the Seller shall hold himself responsible for any claims which they or their heirs, dependents or personal representatives may have or make for damages or compensation for anything done or committed to be done in the course of carrying out of the work covered by this Purchase Order, whether arising on Purchaser's premises or elsewhere and agrees to Indemnify the Purchaser against any such claim or claims if made against the Purchaser and all cost (as between attorney and client) of proceedings, suits or action which the Purchaser may incur or sustain in respect of the same. The Seller shall also procure and keep in force at his own cost comprehensive automobile Liability insurance for adequate coverage in respect of all his vehicle/s visiting or plying in project premises. The Seller shall also be responsible for compliance of existing laws in respect of their workmen and employees.

29.0 PURCHASER'S MATERIAL

29.1 Purchaser's materials shall be delivered to the Seller after the Seller submits the Bank Guarantee for Indemnifying the full value thereof strictly in the manner and as per Performa of Bank Guarantee approved by the Purchaser.

29.2 Wherever possible, the material shall be consigned to goods depot to be specifically confirmed by Seller. The Seller at his responsibility and cost shall arrange Loading/Unloading and any handling from the destination.

29.3 The Seller shall give a firm and binding list of Purchasers issue of materials which shall be duly reviewed & approved by EIL and the desired schedule of its delivery to shop floor strictly in accordance with the sequence of fabrication vis-a-vis the contractual delivery period.

29.4 Unused materials or scrap from material supplied by the Purchaser to the Seller shall be returned by the Seller to the Purchaser or if the Purchaser so directs the Seller may dispose of the same by sale or otherwise on such terms and conditions as the Purchaser may stipulate and the Seller shall pay to the Purchaser the sale proceeds of the material so disposed off by sale deducting there from expenses incurred by the Seller on such sale, the quantum of such deduction to be mutually agreed upon in advance between the Purchaser and the Seller.

30.0 HEADINGS

30.1 The headings of the conditions hereof shall not affect construction thereof.

31.0 ARBITRATION

31.1 Any dispute or difference between the parties hereof arising out of any notified claim of the SELLER included in his final bill and /or arising out of any amount claimed by the OWNER (whether or not the amount claimed by the OWNER or any part thereof shall have been deducted from the Final bill of the supplier or any amount paid by the OWNER to the SELLER in respect of the work) shall be referred to arbitration in accordance with the UNCITRAL Rules as adopted in India by the Arbitration & Conciliation Act, 1996.

31.2 The venue of the arbitration shall be New Delhi.

31.3 Notwithstanding the existence of any dispute or arbitration in terms hereof or otherwise, the Seller shall continue and be bound to continue and perform the works to completion in all respects according to the

31.4 Contract (unless the Contract or works be determined by the Owner or by the Seller under the provisions of the Contract), and the Seller shall remain liable and bound in all respects under the Contract.

32.0 JURISDICTION

32.1 The Seller hereby agrees that the Court situated at New Delhi alone shall have the jurisdiction to hear and determine all action and proceedings arising out of this contract.

33.0 LIMITATION TO LIABILITY

33.1 Notwithstanding anything contrary contained herein, the aggregate total liability of Seller, excluding his liability towards infringement of patent, trade mark or industrial design rights, breach of Confidentiality, Anti-Bribery, Corruption and Conflicts of Interest, under the contract or otherwise shall be limited to 100% of value of Purchase order. However,

neither party shall be liable to the other party for any indirect and consequential damages, loss of profits or loss of production.

34.0 SETTLEMENT OF DISPUTE BETWEEN GOVERNMENT DEPARTMENT/ PUBLIC SECTOR UNDERTAKING

34.1 In the event of any dispute or difference relating to the interpretation and application of the provisions of the contracts, such dispute or difference shall be referred by either party for Arbitration to the sole Arbitrator in the Department of Public Enterprises to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the Arbitrator shall be binding upon the parties to the dispute, provided, however, any party aggrieved by such award may make a further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law & Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary/Additional Secretary, when so authorized by the Law Secretary, whose decision shall bind the Parties finally and conclusively. The Parties to the dispute will share equally the cost of arbitration as intimated by the Arbitrator.

ANNEXURE- I TO GPC
(LIST OF BULK ITEMS)

LIST OF BULK ITEMS

A. PIPING

1. Pipes
2. Fittings
3. Flanges (all kinds / types)
4. Gaskets
5. Bolts/Nuts
6. Strainers
7. Spring Hangers
8. Sample Cooler
9. Gate, Globe, Check Valves (Std Valves)
10. Steam Traps
11. SS/CR Manifold
12. Piston Valve (Steam Tracing)
13. Ball/Plug/Needle/Butterfly valves (Except high performance butterfly valve)
14. Static mixers
15. High Performance Butterfly Valves
16. Motor Operated Valves; Gate, Ball, Butterfly, Plug Vales
17. Hose Pipe
18. O-Lets
19. Dual Plate Check Valves
20. Cryo-LTCS: Gate, Globe, Check, Ball Valves
21. Diaphragm Valves
22. Sight Glass

B. PIPELINE ENGINEERING

1. Assorted Pipes
2. Flanges
3. Fittings
4. Hose & Hose Coupling

C. ELECTRICAL

1. LT Cable
2. FLP Lighting Fixtures and Control Gears
3. Communication Cables
4. Junction Box

D. INSTRUMENTATION

1. Pressure Gauges
2. Draft Pressure Gauges

3. Differential Pressure Gauges
4. Orifices Plates and Flanges
5. RTD, Temperature Gauges & Thermo-wells (Bimatellic, Filled System)
6. Temperature Elements & Thermo-wells
7. Copper Tubes (Bare, Coated)
8. SS Tubes
9. Instrument Tubing
10. Instrument Valves and Manifolds
11. Junction Boxes and Cable Glands
12. Signal Cable
13. Thermocouple Extension Cables
14. Tank Level Inst. (Float Operated)
15. Gauge Glass Cocks
16. Tube Fittings (SS & Brass)
17. Magnetic Level Gauges
18. Optical Fiber Cables and associated items
19. Pressure Relief Valves (Thermal Relief)
20. Variable Area Flowmeter (Indicator)
21. Rupture disc
22. Solenoid Valves
23. Displacer Level Instrument

स्वदेशी सामग्रियों के लिए पैकिंग, मार्किंग, शिपिंग और दस्तावेज विनिर्देश

PACKING, MARKING, SHIPPING AND DOCUMENTATION

SPECIFICATIONS FOR INDIGENOUS MATERIALS

Rev. No	Date	Purpose	Prepared by	Reviewed by	Approved by
1	10-09-2018	ISSUED FOR COMPLIANCE	DDC	DRC	ED (SCM)
0	05-12-2012	ISSUED FOR COMPLIANCE	DDC	DRC	GM (I)

Abbreviations:

CM	-	Centimeters
EIL	-	Engineers India Limited
E-way bill	-	Electronic Way Bill
Kg	-	Kilograms
FTL	-	Full Truck / Trailer Load
KGS	-	Kilograms
L.R.	-	Lorry Receipt / Goods Receipt
mm	-	Millimetre
MT	-	Metric Ton
NO. / NOS.	-	Number / Numbers
P.O.	-	Purchase Order
RCM	-	Resident Construction Manager

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1. GENERAL

1.1 Purpose

This specification details the minimum requirements for the preservation, packing, marking, shipping and documentation of Products, materials and equipment as specified in the respective Purchase Orders or Contracts. This specification forms an integral part of the Purchase Order or Contract issued. However, whenever specific instructions are detailed in the Purchase Order and are in conflict with this specification, particular instructions mentioned in the individual Purchase Order or Contract shall prevail over this general specification.

1.2 Requirements and Conditions

The following requirements are intended as minimum requirements, and compliance to these requirements in no way absolves or relieves Supplier of any responsibility or obligation outlined in the Purchase Order. Equivalent or better packing methods may be deployed wherever supplier's own packing standards are more stringent to the requirements mentioned herein. Supplier shall submit the packing procedure or its equivalent for purchaser's approval during detailed engineering.

In all circumstances, the packing will be designed and constructed in order to support materials during transportation as well as to prevent the materials from damage due to impact, extreme climatic conditions, sun and rain. It must be ensured that the materials and equipments are delivered to the job site by sea, road or air, in good condition.

The Supplier shall, at its own cost, ensure items to be transported are carefully packed and protected in accordance with best practice, having due regard to the climatic conditions encountered during the passage, method of carriage and handling / loading / unloading processes. In addition to any of the measures detailed within this Specification, the Supplier shall apply any other measures that, in its experience, are required to safeguard the particular item. The Supplier shall obtain the approval of EIL / Owner for any variation to the packing, marking and shipping requirements outlined in this Specification.

1.3 Responsibility and liability

Supplier shall be held responsible for any damages and / or losses of all and any kind that may occur by not respecting these specifications. Owner / EIL reserves the right to reject any packing when the packing does not conform to these specifications / instructions and / or when the packing does not ensure perfect protection of the goods and materials. Supplier is responsible for the weights and dimensions declared and the marking of the packages. Supplier will be held responsible in the event goods and materials becoming useless, broken or damaged as a result of poor packing and / or stowing or due to corrosion because of insufficient or inadequate protection. All direct and indirect costs resulting thereof will be back charged to Supplier.

2. CLEANING AND PRESERVATION

2.1 Cleaning

All equipment, materials and parts shall be thoroughly cleaned inside and outside and shall be free from grease, oil, weld spatter, rust and all other foreign matter prior to preservation.

2.2 Preservation

Articles may be exposed to severe environmental or climatic conditions, moisture and dust. All materials and equipment shall be packaged suitable to prevent damage and deterioration during transportation and storage. Where damage occurs due to inadequate packaging of items, the liability for costs associated with rectification of the damage will be to the Supplier's account. All metals subject to corrosion shall be treated with a corrosion preservative suitable for the purpose intended. Products susceptible to corrosion must be packaged in a dry non-corrosive environment for the duration of shipment and storage, for a minimum of 1 year. All bright and machined parts shall be coated with a recognized rust preventative suited to the particular application concerned. All internal parts of machinery shall be treated with lubricant containing rust and oxidation inhibitors to protect equipment from any possible damage. Such lubricants shall be compatible with those which will subsequently be used in service and shall be identified by appropriate tagging. Electrical equipment and instrumentation shall be packed with a suitable desiccant. Delicate equipment such as instruments, electrical switchboards and panels etc. shall be packed for protection to eliminate the effects of vibration.

Wherever necessary, desiccant packs shall be kept to avoid excessive moisture in the packing.

3. PACKING

3.1 General

The instructions herein shall be considered as general directives and minimal requirements, which are applicable to the packing of all equipment and materials. The Supplier is responsible for the correct and adequate packing of the equipment and materials so that these equipment and materials will arrive at destination undamaged and the packing itself in such a condition that, if not otherwise required, it will be suitable for a minimum of 1 year storage.

3.2 Packaging Materials

All packaging together with packaging and protective materials shall be new, maintain its integrity and perform its intended function while being transported, handled and stored.

The quality of packing shall provide maximum protection against damage, breakage and pilferage during transport, storage and multiple handling, including handling by hoisting, lifting devices and / or forklift trucks. Material used for packaging, packing, wrapping, sealers, moisture resistant barriers and corrosion preservatives shall be of recognized brands and grades and shall conform to the best world standards.

Packaged Products showing any damage, defect or shortage resulting from improper packaging, packaging materials or packing procedure or having concealed damage or being short at the time of unpacking shall be subject to rejection and be replaced at the Supplier's cost

3.3 Packing requirements

3.3.1 Wooden Boxes and Crates

Interior support board shall be of strength to withstand multiple handling. Tops of crates shall be one piece wherever possible to avoid seepage through cracks; otherwise a top coating is required. Waterproof lining shall be used for sides, ends and top of crates, proper venting of cargo boxes containing machinery is required, as well as sufficient use

of desiccants. Crates shall be diagonally braced on all faces and suitable for hooks, slings and forklifts. Heavy items shall be secured with wood braces. Fragile items shall be cushioned. Material packed in large boxes shall be layered between plywood sheets to maintain load integrity during transit. Banding shall be used on all boxes to prevent distortion / deformation of the box.

3.3.2 Pallets

When equipment and/or materials are packed on pallets (wood or synthetic), these should be solid double deck pallets that provide adequate load support during transportation and storage (under not always ideal conditions). The pallets should have a dynamic load capacity, enough to carry the mass loaded on the pallet. Where feasible, the top surface of the pallet must be flat. The pallet design must enable safe handling by forklift, cranes etc. and storage on rough surface. Pallets shall be covered with wrapping. All corners, horizontal and vertical shall be protected with cardboard protection strips. The pallet must be tide on all sides with steel or synthetic straps.

3.4 Packaging

All equipment and materials shall be properly fixed (by bolts, clamps, supporting beams, etc.) in such a way that internal movements and / or loosening is impossible. Under the top cover (roof) depending on the case and crate length, a. sufficient number of strong beams shall be placed and properly fixed in order to allow stacking of the cases and crates avoiding any compression. Equipment parts and materials which may be subject to damage by vibration and /or shock must be protected using shock-absorbing material. All equipment and materials which may be damaged by moisture shall be packed in airtight bags in which sufficient desiccant material (e.g. silica gel) is placed. All openings on the equipment must be closed with wooden / metal or plastic covers to prevent damage to the openings and interiors. Fragile and loose parts easily damageable pertaining to the equipment must be securely and properly packed in a separate case.

3.5 Waterproofing

Cases including the cover shall be internally lined with a strong type of waterproof paper or plastic foil. Equipment and materials shall always be packed in a foil (polyethylene or aluminum) for extra (double) protection against rainfall. Those foils shall be applied in such a way that they are self draining.

3.6 Hazardous cargo

The hazardous materials shall be packed in accordance with and in cognizance to the applicable rules, regulations and tariff of all Governmental Authorities and other Governing bodies. Hazardous materials shall always be packed and documented separately from any other material. It shall be the responsibility of the seller of hazardous materials to designate the materials as hazardous and to identify each material by its proper commodity name and its hazardous materials class code. Safety and emergency procedures shall be displayed outside the package. Any certificates required for transportation or for authorities to be supplied before shipment of the goods

4. GUIDELINES FOR PACKING GOODS

In subsequent paragraphs details of different types of packing for different types of goods are defined. Supplier shall make packing details / procedure based on the guidelines and submit for approval.

Chemicals in powder form, catalysts, refractories & like materials etc. shall be packed in drums only.

4.1 Pipe

All pipes 2" included and below shall be packed in crates. All pipes to be capped and ends sealed with waterproof tape. Pipes over 2" up to 6", shall be bundled and banded in bundles of uniform length. Bundling is carried out with U-IRON or traversal planks, joined with threaded connecting rods with locknuts.. Bundle weight shall not exceed 2,000 kg. All pipes are to be capped and ends sealed with waterproof tape (tape is not necessary if end caps are of the pre-shrunk or self-sealing type).Pipes larger than 6" shall be shipped as single lengths with the ends capped. End caps are to be of the recessed type to enable the use of soft faced hooks, but still completely sealing the end and also protecting the weld. All stainless steel / non-ferrous piping must be packed separately in wooden crates. Any banding of bundles is to be with the same material. The bundling and packing of pipe and instrument tubing shall enable the safe discharge of pipe on site using clamps and forklifts. All pipes shall be supported along their lengths to prevent bending / flexing during transport. During loading / unloading slings shall be applied to the center of the load as well as each end to prevent bowing.

Pipe and rigid conduit smaller than DN50 diameter shall be bundled in units not to exceed 1000 kg. Threaded and coupled pipe shall be equipped with plastic thread protectors. All material shall be segregated and shipped by generic material type to prevent cross contamination. Where wire rope or chains are used, adequate padding shall be used at points of contact with pipe. Care must be taken to prevent any chafing of pipes against each other or against the metal structures of the vehicle during transportation. Where necessary, such metal structures must be padded with planks or plastic tubes. Skids and dunnage must be used between the bundles in transit as well as in the storage of coated pipes.

4.2 Pipe Fittings, Flanges, Valves and Gaskets

All pipe fittings, flanges and valves up to 6", are to be packed in cases / crates. For items over 6", these may be fixed securely to a pallet base and enclosed in a crate, for protection. All flange faces / bevel ends shall be suitable protected with plastic caps / end protectors. Where valves have actuators attached, rigidity must be ensured for the valve and actuator. The vulnerable parts of the actuator are to be completely protected within a wooden crate. Empty spaces shall be filled with expanded PU foam to restrict movement in the crate. All stainless steel fittings, flanges and valves of all sizes, must be packed separately in wooden crates. Any strapping is to be with the same material. Gaskets are considered fragile and shall be treated as such. Individual gasket sizes shall be boxed and labeled separately.

All threaded fittings and pipes should be greased and provided with plastic caps.

4.3 Steel Structure and Plates

Structural steel sections and plates shall be strapped in bundles of convenient size and weight for handling. Rolled and shaped plates shall be provided with suitable bracing to eliminate distortion during transit, and shall be bundled in uniform lengths. Each bundle shall be marked with a metal tag, hard stamped, secured under steel wrapping. A 2000 kg limitation shall be imposed for lifts in this category unless exempted.

4.4 Itemized Equipment

Units or parts belonging to main equipment but separately packed shall be clearly marked for easy identification with the main equipment to which they relate.

All flanges, machined working surfaces and threaded parts of all equipment shall be suitably protected. All flanged connections of vessels shall be protected by metal plates correctly casketed by wooden plugs or plastic caps suitably secured in position.

Vessels shall, where possible, be packed on skid constructions and secured with adjustable steel straps. Manholes and other major openings shall be protected with cover flanges or metallic plates firmly secured. Smaller openings shall be closed with plastic plugs / caps.

All vessel internals and items not installed by Supplier at works including accessories such as small parts, bolts, nuts, gaskets, etc. shall be packed in wooden cases separately for each vessel or apparatus and marked with the same item number as the vessel / apparatus in order to protect all parts from loss or damage in transit. Internals, bolts and gaskets for service / testing operations shall be supplied with the vessels / items by Supplier and all internals shall be boxed separately and marked according to marking procedure; each item shall be supplied correctly and identified for field installation by others.

All vessels / heat exchangers or items of such construction shall be dried, thoroughly cleaned inside and be free of all dirt and loose foreign materials. The equipment shall be filled with Nitrogen. Make up arrangement for loss of Nitrogen along with a pressure gauge shall be installed.

All commissioning spare parts shall be packed separately and marked with the relevant main item number.

Pumps, compressors, rotating equipment, turbines and motors will require specific packing and preservation as per the relevant Technical Specification. For skidded equipment openings, flange faces, threaded connections, wires, valve stems, and other component parts that may be subjected to mechanical damage or corrosion shall be adequately protected. This protection shall be applied to all components, both those removed and boxed and those remaining in place on the skid assembly. Each skid shall have one box strapped to it containing a complete set of drawings together with a manual covering installation and operating instructions and other pertinent instructions required for reassembly of components that were disassembled for shipment.

4.5 Control Panels and Electrical Devices

Equipment such as control panels, instruments and electrical devices shall be packed in an interior moisture / vapor-proof barrier with silica gel or comparable desiccant. Desiccants shall be bagged to avoid dispersing in containers. The quantity of desiccant shall be calculated in accordance with the manufacturer's recommendations. Equipment must be secured to the case with bolts, blocks or straps. Adequate precautions (for example, shaft locks to prevent longitudinal / rotational movement of rotor shafts in motors) shall be included in the packaging of all equipment which has plain, ball or roller bearings so as to minimize the risk of bearing damage.

4.6 Instruments

Instruments shall be thoroughly clean, dry and free from rust and individually wrapped using polythene sheets / U foam / Thermocol sheets depending upon the items and then packed in wooden boxes. The left out spaces and top of the boxes should be filled with rubberized coir to get proper cushioning effect. Special attention shall be paid for arresting movements of their operating mechanism during transportation. Silica gel or

other approved desiccant shall be strapped inside but shall not come into contact with the paintwork.

4.7 Cables

All electric cables to be packed in new cable drums made of steel and painted with epoxy resin paint. Cable ends to be carefully protected before packing. Polythene sheet should be wrapped over the cables and sealed properly. Cable drum can be put in wooden crates for ease in handling and transportation.

4.8 Saddles, Supports, Spiders and Lifting Equipment

All items which cannot be transported without independent supports must be supplied with Shipping saddles suitable for land and / or ocean transit. Such transport saddles are to be included within the scope of supply. Supplier is to advise of any requirement for lifting beams or other specialized lifting equipment and will include provision for use of such equipment for loading purposes. The Supplier is responsible for ensuring that all modules and oversize items are adequately braced and where required, plastic wrapped suitable for transport. Modules and oversize items shall be packaged to prevent damage during transport.

4.9 Assortment Of Package / Spare Parts for Erection and Commissioning

Equipment and / or parts of different item numbers shall not be packed together in the same package. Small goods such as accessories, spare parts for erection and commissioning and special tools shall be packed separately in respective inner boxes with tags or labels attached there being clearly indicating their contents. In case such accessories, spare parts and special tools are packed in separate boxes / crates, item no. of main equipment shall be clearly mentioned in Main Shipping Mark for easy identification.

5. MARKING

5.1 General

The purpose of the marking is to identify the packages and detail the weight and dimensions to assure efficient and correct handling during transport and upon arrival at destination.

5.2 Marking Instructions & dispatch details

Packages and crates will be marked with indelible black paint. Marking must be perfectly legible. All packages shall be clearly and properly marked in English language if not otherwise specified.

The shipping marks, which will be shall be stenciled on two sides and one end in clear characters at least 5 centimeters high (where crate size permits, otherwise use optimum size for each package dimension).

The texts shall be printed by means of stamps, stencil-plates or electronically. The use of stickers is not allowed, unless securely covered by plastic. Bundles shall be marked by embossing on two metal tags bearing the shipping marks and placed on each side of the package and securely attaching them to the goods. Paint shall be used on metal surfaces.

Labels or tags to be clearly visible and shall be of a quality to remain visible and attached during transit, handling and storage for a minimum period of 12 Months.

Crates containing fragile articles must be packed with special precaution against risk of breakage and must be stenciled on all sides "FRAGILE - HANDLE WITH CARE". Where crates are not to be overturned, Supplier must show on the crates, clear and readily visible identification, to ensure they are kept in the correct position.

Packages / equipment of 2,000 kg or more must be marked with slinging points on all sides, in addition to the centre of gravity marks.

Number packages consecutively i.e. 1 of 10, 2 of 10, etc. Do not duplicate package numbers. SUPPLIER is responsible for any loss or damage caused by incorrect marking.

All cases/crates shall also be marked with the appropriate international standard graphic symbols for handling.

As a minimum, all cases/crates are to be marked clearly on all four sides with:

"HANDLE WITH CARE" "RIGHT SIDE UP" "KEEP DRY"

In the case of packages with a single gross weight totaling 2,000 kg and / or a height of more than 1m, the centre of gravity shall be clearly marked with the symbol on two adjoining sides. For all items of equipment with an eccentric centre of gravity this symbol shall be marked at the bottom, side and top of the package.

The slinging and lashing points shall be marked with a chain symbol.

When packing in cases / crates, these packages shall also have metal corners at the slinging points.

External front and rear sides of the boxes shall be planed for writing instructions. To facilitate identification, the required colour coding as per the specifications shall be carried out on each package and on corners of pipes & plates.

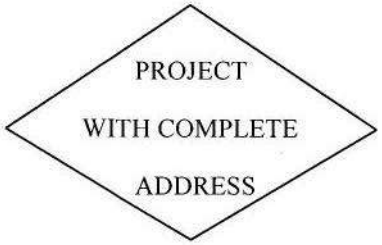
In case of bundles or other packages wherever marking cannot be stenciled, the same shall be embossed on metal or similar tag and wired securely at minimum two convenient points and both ends shall be protected / covered with gunny bags upto 18" (Eighteen Inches). In case of loose pipes, sticker of above markings should be pasted on inner wall corner of each pipe on both sides

Dispatch details such as consignor / consignee address, contract and case details, stacking instructions shall be written on one side of the boxes. One copy of packing slip wrapped in polyethylene bag covered with aluminum packing slip holder to be nailed on the external surface of the box. A packing list and preservation instructions shall be enclosed in a clear weatherproof plastic re-sealable envelope stapled to the box such that the receiver may determine contents without opening the container. An additional packing list is to be enclosed in a clear waterproof plastic re-sealable envelope stapled inside the container. Stapling of the envelopes shall not prevent removal of the documents.

5.3 Shipping Marks

Each package shall be marked on three sides with proper paints / indelible waterproof ink as follows:

(OWNER)



(DESTINATION)

PURCHASE ORDER NO. ----------

NET WEIGHT ---------- KGS. GROSS WEIGHT ---------- KGS.

DIMENSIONS ---------- X ---------- X ---------- CMS

PACKAGE NOS. (SL. NO. OF PACKAGE) OF (TOTAL NO. OF PACKAGES)

TAG / ITEM NO. ----------

SUPLLIER'S NAME----------

The details of the Owner / Project are defined specifically in the Purchase Order / Contract.

5.4 Storage Code

The type of storage required is required to be specified, it will be shown on each packaging in RED colour

X	Crates or packages to be stored outdoor without covers
XX	Crates or packages to be stored under tarpaulin
XXX	Crates or packages to be stored in covered or enclosed premises
XXXX	Crates or packages which must be stored in air-conditioned premises

6. SHIPMENT

Dispatch of material shall be made in accordance with the relevant terms of Purchase Order. Name of the owner, Project, location and other relevant information shall be as per the relevant annexure(s) to the Purchase Order / Contract.

Any change in mode of transport shall be resorted to only after prior approval in writing. Supplier shall ensure dispatch of equipment / materials immediately after they are

inspected and released. All consignments should be booked in the name of 'owner' and not under 'self' basis.

6.1 Dispatch By Road:

a) The Materials shall be dispatched on Door-Delivery basis (smalls or FTL) through a registered transporter.

However, in case, the transporter is nominated by EIL / Owner, the goods shall be dispatched through the same only.

b) The supplier shall ensure with Transport Company the delivery of materials within a reasonable transit period. A complete set of dispatch documents (Delivery Challan / Invoice / Packing List / Test Certificate / L.R. / E-way Bill number etc.) shall be sent to Head (Shipping) at EIL New Delhi and the Resident Construction Manager (RCM) at site.

6.2 Shipment By Air:

Whenever supplier is instructed by EIL/ Owner to airfreight any material, the supplier shall take prompt action for the same. Immediately after air-shipment is effected, the vendor shall intimate by e-mail, the details of Airway Bill number and date, the flight No., Number of packages etc. to Head-Shipping, EIL New Delhi and Resident Construction Manager at EIL (Site).

6.3 Destination:

The consignments should be dispatched to the Consignee / Address as detailed in the Purchase Order.

6.4 Advance Information:

Immediately after a shipment is made supplier shall intimate Underwriter, Head (Shipping) and RCM vide mail regarding particulars of materials, value, Purchase Order No., date of dispatch, L.R. number, E-way Bill No., truck no., name of Transport Company.

6.5 Transmission of Dispatch Documents :

Supplier shall, within 48 hrs. of the dispatch of the materials depending upon the payment terms of the Purchase Order, either negotiate through Owner's / EIL's Bankers or forward directly, by Courier the complete set of dispatch Documents (as detailed in Purchase Order) to Owner / EIL. The supplier shall be responsible for any delay in clearance of the consignment at destination and consequent wharfage / demurrage, if any, due to delay in transmittal of the required documents.

7. TRANSIT RISK INSURANCE

All equipments / materials will be insured for transit risk by (Owners) unless otherwise specified. The insurance cover will be provided from warehouse-to-warehouse.

OISD - GDN - 192
July, 2000

FOR RESTRICTED CIRCULATION

SAFETY PRACTICES DURING CONSTRUCTION

OISD-GDN-192

Oil Industry Safety Directorate

Government of India
Ministry of Petroleum & Natural Gas
8th Floor, OIDB Bhavan, Plot No. 2, Sector – 73, Noida – 201301 (U.P.)

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OISD - GDN - 192
July, 2000

FOR RESTRICTED CIRCULATION

SAFETY PRACTICES DURING CONSTRUCTION

Prepared by

COMMITTEE ON
SAFETY PRACTICES DURING CONSTRUCTION

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Preamble

Indian petroleum industry is the energy lifeline of the nation and its continuous performance is essential for sovereignty and prosperity of the country. As the industry essentially deals with inherently inflammable substances throughout its value chain – upstream, midstream and downstream – Safety is of paramount importance to this industry as only safe performance at all times can ensure optimum ROI of these national assets and resources including sustainability.

While statutory organizations were in place all along to oversee safety aspects of Indian petroleum industry, Oil Industry Safety Directorate (OISD) was set up in 1986 Ministry of Petroleum and Natural Gas, Government of India as a knowledge centre for formulation of constantly updated world-scale standards for design, layout and operation of various equipment, facility and activities involved in this industry. Moreover, OISD was also given responsibility of monitoring implementation status of these standards through safety audits.

In more than 25 years of its existence, OISD has developed a rigorous, multi-layer, iterative and participative process of development of standards – starting with research by in-house experts and iterating through seeking & validating inputs from all stake-holders – operators, designers, national level knowledge authorities and public at large – with a feedback loop of constant updation based on ground level experience obtained through audits, incident analysis and environment scanning.

The participative process followed in standard formulation has resulted in excellent level of compliance by the industry culminating in a safer environment in the industry. OISD – except in the Upstream Petroleum Sector – is still a regulatory (and not a statutory) body but that has not affected implementation of the OISD standards. It also goes to prove the old adage that self-regulation is the best regulation. The quality and relevance of OISD standards had been further endorsed by their adoption in various statutory rules of the land.

Petroleum industry in India is significantly globalized at present in terms of technology content requiring its operation to keep pace with the relevant world scale standards & practices. This matches the OISD philosophy of continuous improvement keeping pace with the global developments in its target environment. To this end, OISD keeps track of changes through participation as member in large number of International and national level Knowledge Organizations – both in the field of standard development and implementation & monitoring in addition to updation of internal knowledge base through continuous research and application surveillance, thereby ensuring that this OISD Standard, along with all other extant ones, remains relevant, updated and effective on a real time basis in the applicable areas.

Together we strive to achieve NIL incidents in the entire Hydrocarbon Value Chain. This, besides other issues, calls for total engagement from all levels of the stake holder organizations, which we, at OISD, fervently look forward to.

Jai Hind!!!

Executive Director
Oil Industry Safety Directorate

FOREWORD

The Oil Industry in India is nearly 100 years old. Due to various collaboration agreements a variety of international codes, standards and practices are in vogue. Standardisation in design philosophies, operating and maintenance practices at a national level was hardly in existence. This lack of uniformity coupled with feedback from some serious accidents that occurred in the recent past in India and abroad, emphasised the need for the industry to review the existing state of art in designing, operating and maintaining oil and gas installations.

With this in view, the Ministry of Petroleum and Natural Gas in 1986 constituted a Safety Council assisted by the Oil Industry Safety Directorate (OISD) staffed from within the industry in formulating and implementing a series of self-regulatory measures aimed at removing obsolescence, standardising and upgrading the existing standards to ensure safer operations. Accordingly OISD constituted a number of functional committees comprising of experts nominated from the industry to draw up standards and guidelines on various subjects.

The present document on "Safety Practices during Construction" was prepared by the Functional Committee on "Safety Practices during Construction". This document is based on the accumulated knowledge and experience of industry members and the various national and international codes and practices.

It is hoped that provisions of this document if implemented objectively, may go a long way to improve the safety to reduce accidents in Oil and Gas Industry. Users are cautioned that no document can be substitute for the judgment of responsible and experienced engineer.

Suggestions are invited from the users after it is put into practice to improve the document further. Suggestions for amendments, if any, to this standard should be addressed to:

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This document in no way supersedes the statutory regulations of Chief Controller of Explosives (CCE), Factory Inspectorate or any other statutory body, which must be followed as applicable.

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These documents are intended to supplement rather than replace the prevailing statutory requirements.

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SAFETY PRACTICES DURING CONSTRUCTION

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SAFETY PRACTICES DURING CONSTRUCTION

1.0 INTRODUCTION

Safety in Construction Management deserves utmost attention especially in the hydrocarbon industry, such as Exploration, Refineries, Pipelines and Marketing installations, Gas Processing units etc. Construction is widely recognised as one of the accident prone activities. Most of the accidents are caused by inadequate planning, failure during the construction process and/or because of design deficiencies. Besides property loss, accidents also result in injuries and fatalities to the personnel; same needs to be prevented.

The reasons for accidents during construction activities are related to unique nature of the industry, human behaviour, difficult work-site conditions, extended odd duty hours, lack of training & awareness and inadequate safety management. Unsafe working methods, equipment failure and improper housekeeping also tend to increase the accident rate in construction.

Ensuring good quality of materials, equipment and competent supervision along with compliance of standard engineering practices shall go a long way to in built safety into the system.

The objective of this standard is to provide practical guidance on technical and educational framework for safety and health in construction with a view to:

(a) prevent accidents and harmful effects on the health of workers arising from employment in construction;
(b) ensure appropriate safety during implementation of construction;
(c) provide safety practice guidelines for appropriate measures of planning, control and enforcement.

2.0 SCOPE

This document specifies broad guidelines on safe practices to be adhered to during construction activities in oil industry. However, before commencing any job, specific hazards and its effects should be assessed and necessary corrective/preventive actions should be taken by all concerned. The document is intended only to supplement and not to replace or supersede the prevailing statutory requirements, which shall also be followed as applicable. For Personal Protective Equipment, OISD-STD-155 (Part I&II) shall be referred to. The scope of this document does not include the design aspects and quality checks during construction.

3.0 DEFINITIONS

Definitions of various terminology are given below:

- *Adequate, appropriate or suitable* are used to describe qualitatively or quantitatively the means or method used to protect the worker.
- *Brace:* A structural member that holds one point in a fixed position with respect to another point; bracing is a system of structural members designed to prevent distortion of a structure.
- *By hand:* The work is done without the help of a mechanised tool.
- *Competent Authority:* A stautory agency having the power to issue regulations, orders or other instructions having the force of law.
- *Competent person:* A person possessing adequate qualifications, such as suitable training and sufficient knowledge, experience and skill for the safe performance of the specific work. The competent authorities may define appropriate criteria for the designation of such persons and may determine the duties to be assigned to them.

- *Execution agency:*

  Any physical or legal person, having contractual obligation with the owner, and who employs one or more workers on a construction site

- *Owner:*

  Any physical or legal person for whom construction job is carried out.

  It shall also include owner's designated representative/consultant/nominee/agent, authorised from time to time to act for and on its behalf, for supervising/ coordinating the activities of the execution agency.

- *Hazard:* Danger or potential danger.

- *Guard-rail:* An adequately secured rail erected along an exposed edge to prevent persons from falling.

- *Hoist:* A machine, which lifts materials or persons by means of a platform, which runs on guides.

- *Lifting gear:* Any gear or tackle by means of which a load can be attached to a lifting appliance but which does not form an integral part of the appliance or load.

- *Lifting appliance:* Any stationary or mobile appliance used for raising or lowering persons or loads.

- *Means of access or egress:* Passageways, corridors, stairs, platforms, ladders and any other means for entering or leaving the workplace or for escaping in case of danger.

- *Scaffold:* Any fixed, suspended or mobile temporary structure supporting workers and material or to gain access to any such structure and which is not a lifting appliance as defined above.

- *Toe-board:* A barrier placed along the edge of a scaffold platform, runway, etc., and secured there to guard against the slipping of persons or the falling of material.

- *Worker:* Any person engaged in construction activity.

- *Workplace:* All places where workers need to be or to go by reason of their work.

4.0 GENERAL DUTIES

4.1 GENERAL DUTIES OF EXECUTION AGENCIES

4.1.1 Execution agency should:

i) provide means and organisation to comply with the safety and health measures required at the workplace.

ii) provide and maintain workplaces, plant, equipment, tools and machinery and organise construction work so that, there is no risk of accident or injury to health of workers. In particular, construction work should be planned, prepared and undertaken so that:

(a) dangers, liable to arise at the workplace, are prevented;
(b) excessively or unnecessarily strenuous work positions and movements are avoided;
(c) organisation of work takes into account the safety and health of workers;
(d) materials and products used are suitable from a safety and health point of view;
(e) working methods are adopted to safeguard workers against the harmful effects of chemical, physical and biological agents.

iii) establish committees with representatives of workers and management or make other arrangement for the participation of workers in ensuring safe working conditions.

iv) arrange for periodic safety inspections by competent persons of all buildings, plant, equipment, tools, machinery, workplaces and review of systems of work, regulations, standards or codes of practice. The competent person should examine and ascertain the safety of construction machinery and equipment.

v) provide such supervision to ensure that workers perform their work with due regard to safety and health of theirs as well as that of others.

vi) Employ only those workers who are qualified, trained and suited by their age, physique, state of health and skill.

vii) satisfy themselves that all workers are informed and instructed in the hazards connected with their work and environment and trained in the precautions necessary to avoid accidents and injury to health.

viii) Ensure that buildings, plant, equipment, tools, machinery or workplaces in which a dangerous defect has been found should not be used until the defect has been rectified.

ix) Organise for and remain always prepared to take immediate steps to stop the operation and evacuate workers as appropriate, where there is an imminent danger to the safety of workers.

x) establish a checking system by which it can be ascertained that all the members of a shift, including operators of mobile equipment, have returned to the camp or base at the close of work on dispersed sites and where small groups of workers operate in isolation.

xi) provide appropriate first aid, training and welfare facilities to workers as per various statutes like the Factories Act, 1948 etc. and, whenever collective measures are not feasible or are insufficient, provide and maintain personal protective equipment and clothing in line with the requirement as per OISD-STD-155 (Vol. I& II) on Personnel Protective Equipment. They should also provide access to workers to occupational health services.

xii) Educate workers about their right and the duty at any workplace to participate in ensuring safe working conditions to the extent of their control over the equipment and methods of work and to express views on working procedures adopted as may affect safety and health.

xiii) Ensure that except in an emergency, workers, unless duly authorised, should not interfere with, remove, alter or displace any safety device or other appliance furnished for their protection or the protection of others, or interfere with any method or process adopted with a view to avoiding accidents and injury to health.

xiv) Ensure that workers do not operate or interfere with plant and equipment that they have not been duly authorised to operate, maintain or use.

xv) Ensure that workers do not sleep, rest or cook etc in dangerous places such as scaffolds, railway tracks, garages, confined spaces or in the vicinity of fires, dangerous or toxic substances, running machines or vehicles and heavy equipment etc.

xvii) Obtain the necessary clearance/permits as required and specified by owner

xviii) As per the Govt. circular as amended from time to time all contractors who employ more than 50 workers or where the contract value exceeds Rs. 50 crores, the following facilities are to be provided by contractor at site :

- Arrangement for drinking water
- Toilet facilities
- A creche where 10 or more women workers are having children below the age of 6 years
- Transport arrangement for attending to emergencies

xix) should deploy a safety officer at site

4.2 GENERAL DUTIES OF OWNERS

4.2.1 Owners should:

i) co-ordinate or nominate a competent person to co-ordinate all activities relating to safety and health on their construction projects;
ii) inform all contractors on the project of special risks to health and safety;
iii) Ensure that executing agency is aware of the owner's requirements and the executing agency's responsibilities with respect to safetry practices before starting the job.

5.0 SAFETY PRACTICES AT WORK PLACES

5.1. GENERAL PROVISIONS

5.1.1 All openings and other areas likely to pose danger to workers should be clearly indicated.

5.1.2 Workers & Supervisors should use the safety helmet and other requisite Personal Protective Equipment according to job & site requirement. They should be trained to use personal protective equipment.

5.1.3 Never use solvents, alkalis and other oils to clean the skin.

5.1.4 Lift the load with back straight and knees bent as far as possible. Seek the help in case of heavy load.

5.1.5 Ensure the usage of correct and tested tools and tackles. Don't allow the make shift tools and tackles.

5.1.6 No loose clothing should be allowed while working near rotating equipment or working at heights.

5.2 MEANS OF ACCESS AND EGRESS

Adequate and safe means of access (atleast two, differently located) to and egress from all workplaces should be provided. Same should be displayed and maintained.

5.3 HOUSEKEEPING

5.3.1 Ensure:

i) proper storage of materials and equipment;
ii) removal of scrap, inflammable material, waste and debris at appropriate intervals.

5.3.2 Removal of loose materials, which are not required for use, to be ensured. Accumulation of these at the site can obstruct means of access to and egress from workplaces and passageways.

5.3.3 Workplaces and passageways, that are slippery owing to oil, grease or other causes, should be cleaned up or strewn with sand, sawdust, ash etc.

5.4 PRECAUTIONS AGAINST THE FALL OF MATERIALS & PERSONS AND COLLAPSE OF STRUCTURES

5.4.1 Precautions should be taken such as the provision of fencing, look-out men or barriers to protect any person against injury by the fall of materials, or tools or equipment being raised or lowered.

5.4.2 Where necessary to prevent danger, guys, stays or supports should be used or other effective precautions should be taken to prevent the collapse of structures or parts of structures that are being erected, maintained, repaired, dismantled or demolished.

5.4.3 All openings through which workers are liable to fall should be kept effectively covered or fenced and displayed prominently.

5.4.4 As far as practicable, guardrails and toe-boards should be provided to protect workers from falling from elevated workplaces.

5.5 PREVENTION OF UNAUTHORISED ENTRY

5.5.1 Construction sites located in built-up areas and alongside vehicular and pedestrian traffic routes should be fenced to prevent the entry of unauthorised persons.

5.5.2 Visitors should not be allowed access to construction sites unless accompanied by or authorised by a competent person and provided with the appropriate protective equipment.

5.6 FIRE PREVENTION AND FIRE FIGHTING

5.6.1 All necessary measures should be taken by the executing agency and owner to:

i) avoid the risk of fire;
ii) control quickly and efficiently any outbreak of fire;
iii) bring out a quick and safe evacuation of persons.
iv) Inform unit/fire station control room, where construction work is carried out within existing operating area.

5.6.2 Combustible materials such us packing materials, sawdust, greasy/oily waste and scrap wood or plastics should not be allowed to accumulate in workplaces but should be kept in closed metal containers in a safe place.

5.6.3 Places where workers are employed should, if necessary to prevent the danger of fire, be provided with:

i) suitable and sufficient fire-extinguishing equipment, which should be easily visible and accessible;
ii) an adequate water supply at sufficient pressure meeting the requirements of various OISD standards.

5.6.4 To guard against danger at places having combustible material, workers should be trained in the action to be taken in the event of fire, including the use of means of escape.

5.6.5 At sites having combustible material, suitable visual signs should be provided to indicate clearly the direction of escape in case of fire.

5.6.6 Means of escape should be kept clear at all times. Escape routes should be frequently inspected particularly in high structures and where access is restricted.

5.7 LIGHTING

5.7.1 Where natural lighting is not adequate, working light fittings or portable hand-lamps should be provided at workplace on the construction site where a worker will do a job.

5.7.2 Emergency lighting should be provided for personnel safety during night time to facilitate standby lighting source, if normal system fails.

5.7.2 Artificial lighting should not produce glare or disturbing shadows.

5.7.3 Lamps should be protected by guards against accidental breakage.

5.7.4 The cables of portable electrical lighting equipment should be of adequate size & characteristics for the power requirements and of adequate mechanical strength to withstand severe conditions in construction operations.

5.8 PLANT, MACHINERY, EQUIPMENT AND HAND TOOLS

5.8.1 General Provisions

i) Plant, machinery and equipment including hand tools, both manual and power driven, should:

a) be of proper design and construction, taking into account health, Safety and ergonomic principles.
b) be maintained in good working order;
c) be used only for work for which they have been designed.
d) be operated only by workers who have been authorised and given appropriate training.
e) be provided with protective guards, shields or other devices as required.

ii) Adequate instructions for safe use should be provided.

iii) Safe operating procedures should be established and used for all plant, machinery and equipment.

iv) Operators of plant, machinery and equipment should not be distracted while work is in progress.

v) Plant, machinery and equipment should be switched off when not in use and isolated before any adjustment, clearing or maintenance is done.

vi) Where trailing cables or hose pipes are used they should be kept as short as practicable and not allowed to create a hazard.

vii) All moving parts of machinery and equipment should be enclosed or adequately guarded.

viii) Every power-driven machine and equipment should be provided with adequate means, immediately accessible and readily identifiable to the operator, of stopping it quickly and preventing it from being started again inadvertently.

ix) Operators of plant, machinery, equipment and tools should be provided with PPEs, including where necessary, suitable ear protection.

5.8.2 Hand tools

i) Hand tools should be repaired by competent persons.

ii) Heads of hammers and other shock tools should be dressed or ground to a suitable radius on the edge as soon as they begin to mushroom or crack.

iii) When not in use and while being carried or transported sharp tools should be kept in sheaths, shields, chests or other suitable containers.

iv) Only insulated or nonconducting tools should be used on or near live electrical installations.

v) Only non-sparking tools should be used near or in the presence of flammable or explosive dusts or vapours.

5.8.3 Pneumatic Tools

i) Operating triggers on portable pneumatic tools should be:
a) so placed as to minimise the risk of accidental starting of the machine.
b) so arranged as to close the air inlet valve automatically when the pressure of the operator's hand is removed.

ii) Hose and hose connections for compressed air supply to portable pneumatic tools should be:

a) designed and tested for the pressure and service for which they are intended;
b) fastened securely on the pipe outlet and equipped with the safety chain, as appropriate.

iii) Pneumatic shock tools should be equipped with safety clips or retainers to prevent dies and tools from being accidentally expelled from the barrel.

iv) Pneumatic tools should be disconnected from power and the pressure in hose lines released before any adjustment or repair is made.

5.8.4 Electrical Tools

i) Low voltage portable electrical tools should generally be used.

ii) All electrical tools should be earthed, unless they are "all insulated" or "double insulated" tools which do not require earthing.

iii) All electrical tools should get inspected and maintained on a regular basis by a competent electrician and complete records kept.

5.8.5 Engines

i) Engines should:

a) be installed so that they can be started safely and the maximum safe speed cannot be exceeded.
b) have controls for limiting speed.
c) have devices to stop them from a safe place in an emergency.

ii) IC engines should not be run in confined spaces unless adequate exhaust ventilation is provided.

iii) When IC engines are being fuelled:

a) the engine should be shut off.
b) care should be taken to avoid spilling fuel;
c) no person should smoke or have an naked light in the vicinity.
d) a fire extinguisher should be kept readily available.

iv) Secondary fuel reservoir should be placed outside the engine room.

6.0 CONSTRUCTION ACTIVITIES

The various common activities in construction are as under:

- Excavation
- Scaffolding, Platforms & Ladders
- Structural Work, Laying of Reinforcement & Concreting
- Road Work (Laying of roads)
- Cutting /Welding
- Working in Confined Space
- Proof/Pressure Testing
- Working at Heights
- Handling & Lifting Equipments
- Vehicle Movement
- Electrical
- Offshore
- Demolition
- Radiography
- Sand/shot blasting/ spray painting
- Work above water

The safe practices to be followed during the implementation of above construction activities are given below:

6.1 EXCAVATION

6.1.1 All excavation work should be planned and the method of excavation and the type of support work required should be decided considering the following:

i) the stability of the ground;
ii) the excavation will not affect adjoining buildings, structures or roadways;
iii) to prevent hazard, the gas, water, electrical and other public utilities should be shut off or disconnected, if necessary;
iv) presence of underground pipes, cable conductors, etc.,
v) the position of culvert/bridges, temporary roads and spoil heaps should be determined;

6.1.2 Before digging begins on site, all excavation work should be planned and the method of excavation and the type of support work required decided.

6.1.3 All excavation work should be supervised.

6.1.4 Sites of excavations should be thoroughly inspected:

i) daily, prior to each shift and after interruption in work of more than one day;
ii) after every blasting operation;
iii) after an unexpected fall of ground;
iv) after substantial damage to supports;
v) after a heavy rain, frost or snow;
vi) when boulder formations are encountered.

6.1.5 Safe angle of repose while excavating trenches exceeding 1.5m depth upto 3.0m should be maintained. Based on site conditions, provide proper slope, usually 45^0,and suitable bench of 0.5m width at every 1.5m depth of excavation in all soils except hard rock or provide proper shoring and strutting to prevent cave-in or slides.

6.1.6 As far as possible, excavated earth should not be placed within one meter of the edge of the trench or depth of trench whichever is greater.

6.1.7 Don't allow vehicles to operate too close to excavated area. Maintain atleast 2m distance from edge of excavation. No load, plant or equipment should be placed or moved near the edge of any excavation where it is likely to cause its collapse and thereby endanger any person unless precautions such as the provision of shoring or piling are taken to prevent the sides from collapsing.

6.1.8 Adequately anchored stop blocks and barriers should be provided to prevent vehicles being driven into the excavation. Heavy vehicles should not be allowed near the excavation unless the support work has been specially designed to permit it.

6.1.9 If an excavation is likely to affect the security of a structure on which persons are working, precautions should be taken to protect the structure from collapse.

6.1.10 Barricade at 1m height (with red & white band/self glowing caution board) should be provided for excavations beyond 1.5m depth. Provide two entries/exits for such excavation.

6.1.11 Necessary precautions should be taken for underground utility lines like cables, sewers etc. and necessary approvals/clearances from the concerned authorities shall be obtained before commencement of the excavation job.

6.1.12 Water shall be pumped/bailed out, if any accumulates in the trench. Necessary precautions should be taken to prevent entry of surface water in trenches.

6.1.13 During rains, the soil becomes loose. Take additional precaution against collapse of side wall.

6.1.14 In hazardous areas, air should be tested to ascertain its quality. No one should be allowed entry till it is suitable for breathing.

6.1.15 In case of mechanised excavation, precaution shall be taken to not to allow anybody to come within one meter of extreme reach of the mechanical shovel. The mechanised excavator shall be operated by a well-trained experienced operator. When not in operation, the machine shall be kept on firm leveled ground with mechanical shovel resting on ground. Wheel or belt shall be suitably jammed to prevent any accidental movement of the machine. Suitable precautions as per manufacturer guidelines should be taken for dozers, graders and other heavy machines.

6.1.16 In case of blasting, follow strictly IS:4081-1986 & Indian Explosive Act and rules for storage, handling and carrying of explosive materials and execution of blasting operation.

6.2 SCAFFOLDING, PLATFORMS & LADDERS

6.2.1 Metal as material of construction

i) A scaffold should be provided and maintained or other equally safe and suitable provision should be made where work cannot safely be done on or from the ground or from part of a building or other permanent structure.

ii) Scaffolds should be provided with safe means of access, such as stairs, ladders or ramps. Ladders should be secured against inadvertent movement.

iii) Every scaffold should be constructed, erected and maintained so as to prevent collapse or accidental displacement when in use.

iv) Every scaffold and part thereof should be constructed :

(a) in such a way so as not to cause hazards for workers during erection and dismantling;
(b) in such a way so as guard rails and other protective devices, platforms, ladders, stairs or ramps can be easily put together;
(c) with sound material and of requisite size and strength for the purpose for which it is to be used and maintained in a proper condition.

v) Boards and planks used for scaffolds should be protected against splitting.

vi) Materials used in the construction of scaffolds should be stored under good conditions and apart from any material unsuitable for scaffolds.

vii) Couplers should not cause deformation in tubes. Couplers should be made of drop forged steel or equivalent material.

viii) Tubes should be free from cracks, splits and excessive corrosion and be straight to the eye, and tube ends cut cleanly square with the tube axis.

ix) Scaffolds should be designed for their maximum load as per relevant code.

x) Scaffolds should be adequately braced.

xi) Scaffolds which are not designed to be independent should be rigidly connected to the building at designated vertical and horizontal places.

xii) A scaffold should never extend above the highest anchorage to an extent which might endanger its stability and strength.

xiii) Loose bricks, drainpipes, chimney-pots or other unsuitable material should not be used for the construction or support of any part of a scaffold.

xiv) Scaffolds should be inspected and certified:

(a) before being taken into use;
(b) at periodic intervals thereafter as prescribed for different types of scaffolds;
(c) after any alteration, interruption in use, exposure to weather or seismic conditions or any other occurrence likely to have affected their strength or stability.

xv) Inspection should more particularly ascertain that:

(a) the scaffold is of suitable type and adequate for the job;

(b) materials used in its construction are sound and of sufficient strength;
(c) it is of sound construction and stable;
(d) that the required safeguards are in position.

xvi) A scaffold should not be erected, substantially altered or dismantled except by or under the supervision.

xvii) Every scaffold should be maintained in good and proper condition, and every part should be kept fixed or secured so that no part can be displaced in consequence of normal use.

xviii) If out-rigger scaffolding is to be used, it should be specifically designed and inspected before putting in use.

6.2.2 Lifting appliances on scaffolds

i) When a lifting appliance is to be used on a scaffold:

(a) the parts of the scaffold should be carefully inspected to determine the additional strengthening and other safety measures required;
(b) any movement of the scaffold members should be prevented;
(c) if practicable, the uprights should be rigidly connected to a solid part of the building at the place where the lifting appliance is erected.

6.2.3 Prefabricated scaffolds

i) In the case of prefabricated scaffold systems, the instructions provided by the manufacturers or suppliers should be strictly adhered to. Prefabricated scaffolds should have adequate arrangements for fixing bracing.

ii) Frames of different types should not be intermingled in a single scaffold.

iii) Scaffolding shall be erected on firm and level ground.

iv) All members of metal scaffolding shall be checked periodically to screen out defective / rusted members. All joints should be properly lubricated for easy tightening.

v) Entry to scaffolding should be restricted.

vi) Erection, alteration and removal shall be done under supervision of experienced personnel.

vii) Use of barrels, boxes, loose bricks etc., for supporting platform shall not be permitted.

viii) Each supporting member of platform shall be securely fastened and braced

ix) Where planks are butt-joined, two parallel putlogs shall be used, not more than 100mm apart, to give support to each plank.

x) Platform plank shall not project beyond its end support to a distance exceeding 4 times the thickness of plank, unless it is effectively secured to prevent tipping. Cantilever planks should be avoided.

xi) The platform edges shall be provided with 150mm high toe board to eliminate hazards of tools or other objects falling from platform.

xii) Erect ladders in the “four up-one out position”

xiii) Lash ladder securely with the structure.

xiv) Using non-slip devices, such as, rubber shoes or pointed steel ferules at the ladder foot, rubber wheels at ladder top, fixing wooden battens, cleats etc.

xv) When ladder is used for climbing over a platform, the ladder must be of sufficient length, to extend at least one meter above the platform, when erected against the platform in “four up-one out position.”

xvi) Portable ladders shall be used for heights not more than 4mt. Above 4mt flights, fixed ladders shall be provided with at least 600 mm landings at every 6mt or less.

xvii) The width of ladder shall not be less than 300mm and rungs shall be spaced not more than 300mm.

xviii) Every platform and means of access shall be kept free from obstruction.

xix) If grease, mud, gravel, mortar etc., fall on platform or scaffolds, these shall be removed immediately to avoid slippage.

xx) Workers shall not be allowed to work on scaffolds during storms or high wind. After heavy rain or storms, scaffolds shall be inspected before reuse.

xxi) Don't overload the scaffolding. Remove excess material and scrap immediately.

xxii) Dismantling of scaffolds shall be done in a pre-planned sequential manner.

6.2.4 Suspended scaffolds/boatwain's chair

i) In addition to the requirements for scaffolds in general as regards soundness, stability and protection against the risk of falls, suspended scaffolds should meet the following specific requirements.

(a) platforms should be designed and built with dimensions that are compatible with the stability of the structure as a whole, especially the length;
(b) the number or anchorage should be compatible with the dimensions of the platform;
(c) the safety of workers should be safeguarded by an extra rope having a point of attachment independent of the anchorage arrangements of the scaffold;
(d) the anchorage and other elements of support of the scaffold should be designed and built in such a way as to ensure sufficient strength;
(e) the ropes, winches, pulleys or pulley blocks should be designed, assembled, used and maintained according to the requirements established for lifting gear adapted to the lifting of persons according to national laws and regulations;
(f) Before use, the whole structure should be checked by a competent person.

6.2.5 Bamboo Scaffolding

i) In general, it should be avoided as far as possible. It should not be used in the unit/off-site areas and where hot work is to be done.

ii) For construction and maintenance of residential and office buildings, situated outside explosive licensed area, bamboo scaffold, if used, should conform to provisions given in IS-3696 (Part 1)-1987.

6.3 STRUCTURAL WORK, LAYING OF REINFORCEMENT & CONCRETING

6.3.1 General provisions

i) The erection or dismantling of buildings, structures, civil engineering works, formwork, falsework and shoring should be carried out by trained workers only under the supervision of a competent person.

ii) Precautions should be taken to guard against danger to workers arising from any temporary state of weakness or instability of a structure.

iii) Formwork, falsework and shoring should be so designed, constructed and maintained that it will safely support all loads that may be imposed on it.

iv) Formwork should be so designed and erected that working platforms, means of access, bracing and means of handling and stabilising are easily fixed to the formwork structure.

6.3.2. Erection and dismantling of steel and prefabricated structures

i) The safety of workers employed on the erection and dismantling of steel and prefabricated structures should be ensured by appropriate means, such as provision and use of:

(a) ladders, gangways or fixed platforms;
(b) platforms, buckets, boatswain's chairs or other appropriate means suspended from lifting appliances;
(c) safety harnesses and lifelines, catch nets or catch platforms;
(d) Power-operated mobile working platforms.

ii) Steel and prefabricated structures should be so designed and made that they can be safely transported and erected.

iii) In addition to the need for the stability of the part when erected, the design should explicitly take following into account:

(a) the conditions and methods of attachment in the operations of transport, storing and temporary support during erection or dismantling as applicable;
(b) Methods for the provision of safeguards such as railings and working platforms, and, when necessary, for mounting them easily on the structural steel or prefabricated parts.

iv) The hooks and other devices built in or provided on the structural steel or prefabricated parts that are required for lifting and transporting them should be so shaped, dimensioned and positioned as:

(a) to withstand with a sufficient margin the stresses to which they are subjected;
(b) Not to set up stresses in the part that could cause failures, or stresses in the structure itself not provided for in the plans, and be designed to permit easy release from the lifting appliance. Lifting points for floor and staircase units should be located (recessed if necessary) so that they do not protrude above the surface;
(c) To avoid imbalance or distortion of the lifted load.

v) Storeplaces should be so constructed that:

(a) there is no risk of structural steel or prefabricated parts falling or overturning;
(b) storage conditions generally ensure stability and avoid damage having regard to the method of storage and atmospheric conditions;
(c) racks are set on firm ground and designed so that units cannot move accidentally.

vi) While they are being stored, transported, raised or set down, structural steel or prefabricated parts should not be subjected to stresses prejudicial to their stability.

vii) Every lifting appliance should:

(a) be suitable for the operations and not be capable of accidental disconnection;
(b) be approved or tested as per statutory requirement.

viii) Lifting hooks should be of the self-closing type or of a safety type and should have the maximum permissible load marked on them.

ix) Tongs, clamps and other appliances for lifting structural steel and prefabricated parts should:

(a) be of such shape and dimensions as to ensure a secure grip without damaging the part;
(b) be marked with the maximum permissible load in the most unfavourable lifting conditions.

x) Structural steel or prefabricated parts should be lifted by methods or appliances that prevent them from spinning accidentally.

xi) When necessary to prevent danger, before they are raised from the ground, structural steel or prefabricated parts should be provided with safety devices such as railings and working platforms to prevent falls of persons.

xii) While structural steel or prefabricated parts are being erected, the workers should be provided with appliances for guiding them as they are being lifted and set down, so as to avoid crushing of hands and to facilitate the operations. Use of such appliances should be ensured.

xiii) A raised structural steel or prefabricated part should be so secured and wall units so propped that their stability cannot be imperiled, even by external agencies such as wind and passing loads before its release from the lifting appliance.

xiv) At work places, instruction should be given to the workers on the methods, arrangements and means required for the storage, transport, lifting and erection of structural steel or prefabricated parts, and, before erection starts, a meeting of all those responsible should be held to discuss and confirm the requirements for safe erection.

xv) During transportation within the construction area, attachments such as slings and stirrups mounted on structural steel or prefabricated parts should be securely fastened to the parts.

xvi) Structural steel or prefabricated parts should be so transported that the conditions do not affect the stability of the parts or the means of transport result in jolting, vibration or stresses due to blows, or loads of material or persons.

xvii) When the method of erection does not permit the provision of other means of protection against fall of persons, the workplaces should be protected by guardrails, and if appropriate by toe-boards.

xviii) When adverse weather conditions such as snow, ice and wind or reduced visibility entail risks of accidents, the work should be carried on with particular care, or, if necessary, interrupted.

xix) Structures should not be worked on during violent storms or high winds, or when they are covered with ice or snow, or are slippery from other causes.

xx) If necessary, to prevent danger, structural steel parts should be equipped with attachments for suspended scaffolds, lifelines or safety harnesses and other means of protection.

xxi) The risks of falling, to which workers moving on high or sloping girders are exposed, should be limited by all means of adequate collective protection or, where this is impossible, by the use of a safety harness that is well secured to a strong support.

xxii) Structural steel parts that are to be erected at a great height should as far as practicable be assembled on the ground.

xxiii) When structural steel or prefabricated parts are being erected, a sufficiently extended area underneath the workplace should be barricaded or guarded

xxiv) Steel trusses that are being erected should be adequately shored, braced or guyed until they are permanently secured in position.

xxv) Load-bearing structural member should not be dangerously weakened by cutting, holing or other means.

xxvi) Structural members should not be forced into place by the hoisting machine while any worker is in such a position that he could be injured by the operation.

xxvii) Open-web steel joists that are hoisted singly should be directly placed in position and secured against dislodgment.

6.3.3 Reinforcement

i) Ensure that workers use Personnel Protective equipment like safety helmet, safety shoes, gloves etc.

ii) Don't place the hand below the rods for checking clear distance. Use measuring devices.

iii) Don't wear loose clothes while checking the rods.

iv) Don't stand unnecessarily on cantilever rods.

v) To carry out welding/cutting of rods, safety procedures/precautions as mentioned in Item No. 6.5 to be followed.

vi) For supplying of rods at heights, proper staging and/or bundling to be provided.

vii) Ensure barricading and staging for supplying and fixing of rods at height.

viii) For short distance carrying of materials on shoulders, suitable pads to be provided.

ix) While transporting material by trucks/trailers, the rods shall not protrude in front of or by the sides of driver's cabin. In case such protrusion cannot be avoided behind the deck, then it should not extend 1/3rd of deck length or 1.5M which ever is less and tied with red flags/lights.

6.3.4 Concreting

i) Ensure stability of shuttering work before allowing concreting.

ii) Barricade the concreting area while pouring at height/depths.

iii) Keep vibrator hoses, pumping concrete accessories in healthy conditions and mechanically locked.

iv) Pipelines in concrete pumping system shall not be attached to temporary structures such as scaffolds and formwork support as the forces and movements may effect their integrity.

v) Check safety cages & guards around moving motors/parts etc. provided in concreting mixers.

vi) Use Personal Protective Equipment like gloves, safety shoes etc. while dealing with concrete and wear respirators for dealing with cement.

vii) Earthing of electrical mixers, vibrators, etc. should be done and verified.

viii) Cleaning of rotating drums of concrete mixers shall be done from outside. Lockout devices shall be provided where workers need to enter.

ix) Where concrete mixers are driven by internal combustion engine, exhaust points shall be located away from the worker's workstation so as to eliminate their exposure to obnoxious fumes.

x) Don't allow unauthorised person to stand under the concreting area.

xi) Ensure adequate lighting arrangements for carrying out concrete work during night.

xii) Don't allow the same workers to pour concrete round the clock. Insist on shift pattern.

xiii) During pouring, shuttering and its supports should be continuously watched for defects.

6.4 ROAD WORK

6.4.1 Site shall be barricaded and provided with warning signs, including night warning lamps at appropriate locations for traffic diversion.

6.4.2 Filled and empty bitumen drums shall be stacked separately at designated places.

6.4.3 Mixing aggregate with bitumen shall preferably be done with the help of bitumen batch mixing plant, unless operationally non-feasible.

6.4.4 Road rollers, Bitumen sprayers, Pavement finishers shall be driven by experienced drivers with valid driving license.

6.4.5 Workers handling hot bitumen sprayers or spreading bitumen aggregate mix or mixing bitumen with aggregate, shall be provided with PVC hand gloves and rubber shoes with legging up to knee joints.

6.4.6 At the end of day's work, surplus hot bitumen in tar boiler shall be properly covered by a metal sheet, to prevent anything falling in it,

6.4.7 If bitumen accidentally falls on ground, it shall be immediately covered by sprinkling sand, to prevent anybody stepping on it. Then it shall be removed with the help of spade.

6.4.8 For cement concrete roads, besides site barricading and installation of warning signs for traffic diversion, safe practices mentioned in the chapter on "Concreting", shall also be applicable.

6.5 CUTTING/WELDING

6.5.1 Common hazards involved in welding/cutting are sparks, molten metal, flying particles, harmful light rays, electric shocks etc. Following precautions should be taken: -

i) A dry chemical type fire extinguisher shall be made available in the work area.

ii) Adequate ventilation shall be ensured by opening manholes and fixing a shield or forced circulation of air etc, while doing a job in confined space.

iii) Ensure that only approved and well-maintained apparatus, such as torches, manifolds, regulators or pressure reducing valves, and acetylene generators, be used.

iv) All covers and panels shall be kept in place, when operating an electric Arc welding machine.

v) The work piece should be connected directly to Power supply, and not indirectly through pipelines/structures/equipments etc.

vi) The welding receptacles shall be rated for 63 A suitable for 415V, 3-Phase system with a scraping earth. Receptacles shall have necessary mechanical interlocks and earthing facilities.

vii) All cables, including welding and ground cables, shall be checked for any worn out or cracked insulation before starting the job. Ground cable should be separate without any loose joints.

viii) Cable coiling shall be maintained at minimum level, if not avoidable.

ix) An energised electrode shall not be left unattended.

x) The power source shall be turned off at the end of job.

xi) All gas cylinders shall be properly secured in upright position.

xii) Acetylene cylinder shall be turned and kept in such a way that the valve outlet points away from oxygen cylinder.

xiii) Acetylene cylinder key for opening valve shall be kept on valve stem, while cylinder is in use, so that the acetylene cylinder could be quickly turned off in case of emergency. Use flash back arrestors to prevent back-fire in acetylene/oxygen cylinder.

xiv) When not in use, valves of all cylinders shall be kept closed.

xv) All types of cylinders, whether full or empty, shall be stored at cool, dry place under shed.

xvi) Forced opening of any cylinder valve should not be attempted.

xvii) Lighted gas torch shall never be left unattended.

xviii) Store acetylene and oxygen cylinders separately.

xix) Store full and empty cylinders separately.

xx) Avoid cylinders coming into contact with heat.

xxi) Cylinders that are heavy or difficult to carry by hand may be rolled on their bottom edge but never dragged.

xxii) If cylinders have to be moved, be sure that the cylinder valves are shut off.

xxiii) Before changing torches, shut off the gas at the pressure reducing regulators and not by crimping the hose.

xxiv) Do not use matches to light torches, use a friction lighter.

xxv) Move out any leaking cylinder immediately.

xxvi) Use trolleys for oxygen & acetylene cylinder and chain them.

xxvii) Always use Red hose for acetylene and other fuel gases and Black for oxygen, and ensure that both are in equal length.

xxviii) Ensure that hoses are free from burns, cuts and cracks and properly clamped.

xxix) Avoid dragging hoses over sharp edges and objects

xxx) Do not wrap hoses around cylinders when in use or stored.

xxxi) Protect hoses from flying sparks, hot slag, and other hot objects.

xxxii) Lubricants shall not be used on Ox-fuel gas equipment.

xxxiii) During cutting/welding, use proper type goggles/face shields.

6.6 WORKING IN CONFINED SPACES

6.6.1 Following safety practices for working in confined space like towers, columns, tanks and other vessels should be followed in addition to the safety guidelines for specific jobs like scaffolding, cutting/welding etc.

i) Shut down, isolate, depressurise and purge the vessel as per laid down procedures.

ii) Entry inside the vessel and to carry out any job should be done after issuance of valid permit only in line with the requirement of OISD-STD-105.

iii) Ensure proper and accessible means of exit before entry inside a confined space.

iv) The number of persons allowed inside the vessel should be limited to avoid overcrowding.

v) When the work is going on in the confined space, there should always be one man standby at the nearby manway.

vi) Before entering inside the vessels underground or located at lower elevation, probability of dense vapours accumulating nearby should also be considered in addition to inside the vessel.

vii) Ensure requisite O_2 level before entry in the confined space and monitor level periodically or other wise use respiratory devices.

viii) Check for no Hydrocarbon or toxic substances before entry and monitor level periodically or use requisite Personal Protective Equipment.

ix) Ensure adequate ventilation or use respiratory devices.

x) Depending upon need, necessary respirator system, gas masks and suit shall be worn by everyone entering confined space. In case of sewer, OWS or in the confined area where there is a possibility of toxic or inert gas, gas masks shall be used by everyone while entering.

xi) Barricade the confined spaces during hoisting, radiography, blasting, pressure testing etc.

xii) Use 24V flameproof lamp fittings only for illumination.

xiii) Use tools with air motors or electric tools with maximum voltage of 24V.

xiv) House keeping shall be well maintained.

xv) Safety helmet, safety shoes and safety belt shall be worn by everyone entering the confined space.

xvi) Don't wear loose clothing while working in a confined space.

xvii) In case of the vessels which are likely to contain pyropheric substances (like Iron Sulphide), special care need to be taken before opening the vessel. Attempt should be

made to remove the pyropheric substances. Otherwise, these should be always kept wet by suitable means.

xviii) The cutting torches should also be kept outside the vessel immediately after the cutting.

xix) The gas cylinders used for cutting/welding shall be kept outside.

xx) All cables, hoses, welding equipment etc., shall be removed from confined space at end of each work day, even if the work is to be resumed in the same space the next day.

xxi) To the extent possible sludge shall be cleared and removed from outside before entering.

xxii) No naked light or flame or hot work such as welding, cutting and soldering should be permitted inside a confined space or area unless it has been made completely free of the flammable atmosphere, tested and found safe by a competent person. Only non-sparking tools and flameproof hand lamps protected with guard and safety torches should be used inside such confined space or area for initial inspection, cleaning or other work required to be done for making the area safe.

xxiii) Communication should be always maintained between the worker and the attendant.

6.7 PROOF/PRESSURE TESTING

6.7.1 Review test procedure before allowing testing with water or air or any other fluid.

6.7.2 Provide relief valves of adequate size while testing with air or other gases.

6.7.3 Ensure compliance of necessary precautions, step wise loading, tightening of fasteners, grouting etc. before and during testing.

6.7.4 Inform all concerned in advance of the testing.

6.7.5 Keep the vents open before opening any valve for filling/draining of liquid used for hydrotesting. The filling/draining should not exceed the designed rate for pressure testing.

6.7.6 Provide separate gauges of suitable range for pressurising pump and the equipment to be tested.

6.7.7 Provide gauges at designated locations for monitoring of pressures.

6.7.8 Check the calibration of all pressurising equipment and accessories and maintain records.

6.7.9 Take readings at pre-defined intervals.

6.8 WORKING AT HEIGHTS

6.8.1 General Provision

i) While working at a height of more than 3 meters, ISI approved safety belt shall be used.

ii) While working at a height of more than 3 meters, permit should be issued by competent person before commencement of the job.

iii) Worker should be well trained on usage of safety belt including its proper usage at the time of ascending/descending.

iv) All tools should be carried in tool kits to avoid their falling.

v) If the job is on fragile/sloping roof, roof walk ladders shall be used.

vi) Provide lifeline wherever required.

vii) Additional safety measures like providing Fall Arrestor type Safety belt, safety net should be provided depending upon site conditions, job requirements.

viii) Keep working area neat and clean. Remove scrap material immediately.

ix) Don't throw or drop material/equipment from height.

x) Avoid jumping from one member to another. Use proper passageway.

xi) Keep both hands free while climbing. Don't try to bypass the steps of the ladder.

xii) Try to maintain calm at height. Avoid over exertion.

xiii) Avoid movements on beam.

xiv) Elevated workplaces including roofs should be provided with safe means of access and egress such as stairs, ramps or ladders.

6.8.2 Roof Work

i) All roof-work operations should be pre-planned and properly supervised.

ii) Roof work should only be undertaken by workers who are physically and psychologically fit and have the necessary knowledge and experience for such work.

iii) Work on roofs shouldn't be carried on in weather conditions that threaten the safety of workers.

iv) Crawling boards, walkways and roof ladders should be securely fastened to a firm structure.

v) Roofing brackets should fit the slope of the roof and be securely supported.

vi) Where it is necessary for a person to kneel or crouch near the edge of the roof, necessary precautions should be taken.

vii) On a large roof where work have to be carried out at or near the edge, a simple barrier consisting of crossed scaffold tubes supporting a tubing guardrail may be provided.

viii) All covers for openings in roofs should be of substantial construction and be secured in position.

ix) Roofs with a pitch of more than 10 should be treated as sloping.

x) When work is being carried out on sloping roofs, sufficient and suitable crawling boards or roof ladders should be provided and firmly secured in position.

xi) During extensive work on the roof, strong barriers or guardrails and toe-boards should be provided to stop a person from falling off the roof.

xii) Where workers are required to work on or near roofs or other places covered with fragile material, through which they are liable to fall, they should be provided with suitable roof ladders or crawling boards strong enough and when spanning across the supports for the roof covering to support those workers.

xiii) A minimum of two boards should be provided so that it is not necessary for a person to stand on a fragile roof to move a board or a ladder, or for any other reason.

6.8.3 Work on tall chimneys

i) For the erection and repair of tall chimneys, scaffolding should be provided. A safety net should be maintained at a suitable distance below the scaffold.

ii) The scaffold floor should always be at least 65 cm below the top of the chimney.

iii) Under the working floor of the scaffolding the next lower floor should be left in position as a catch platform.

iv) The distance between the inside edge of the scaffold and the wall of the chimney should not exceed 20 cm at any point.

v) Catch platforms should be erected over:

(a) the entrance to the chimney;
(b) Passageways and working places where workers could be endangered by falling objects.

vi) For climbing tall chimneys, access should be provided by:

(a) stairs or ladders;
(b) a column of iron rungs securely embedded in the chimney wall;
(c) Other appropriate means.

vii) When workers use the outside rungs to climb the chimney, a securely fastened steel core rope looped at the free end and hanging down at least 3 m should be provided at the top to help the workers to climb on to the chimney.

viii) While work is being done on independent chimneys the area surrounding the chimney should be enclosed by fencing at a safe distance.

ix) Workers employed on the construction, alteration, maintenance or repair of tall chimneys should not:

a) work on the outside without a safety harness attached by a lifeline to a rung, ring or other secure anchorage;
b) put tools between the safety harness and the body or in pockets not intended for the purpose;
c) haul heavy materials or equipment up and down by hand to or from the workplace on the chimney;
d) fasten pulleys or scaffolding to reinforcing rings without first verifying their stability;
e) work alone;
f) climb a chimney that is not provided with securely anchored ladders or rungs;
g) Work on chimneys in use unless the necessary precautions to avoid danger from smoke and gases have been taken.

x) Work on independent chimneys should not be carried on in high winds, icy conditions, fog or during electrical storms.

6.9 HANDLING AND LIFTING EQUIPMENT:

6.9.1 General Provisions

Following are the general guidelines to be followed with regard to all types of handling and lifting equipment in addition to the guidelines for specific type of equipments dealt later on.

i) There should be a well-planned safety programme to ensure that all the lifting appliances and lifting gear are selected, installed, examined, tested, maintained, operated and dismantled with a view to preventing the occurrence of any accident;

ii) All lifting appliances shall be examined by competent persons at frequencies as specified in "The Factories act".

iii) Check thoroughly quality, size and condition of all lifting tools like chain pulley blocks, slings, U-clamps, D-shackles etc. before putting them in use.

iv) Safe lifting capacity of all lifting & handling equipment, tools and shackles should be got verified and certificates obtained from competent authorities before its use. The safe working load shall be marked on them.

v) Check periodically the oil, brakes, gears, horns and tyre pressure of all moving equipments like cranes, forklifts, trailers etc as per manufacturer's recommendations.

vi) Check the weights to be lifted and accordingly decide about the crane capacity, boom length and angle of erection.

vii) Allow lifting slings as short as possible and check packing at the friction points.

viii) While lifting/placing of the load, no unauthorised person shall remain within the radius of the boom and underneath the load.

ix) While loading, unloading and stacking of pipes, proper wedges shall be placed to prevent rolling down of the pipes.

x) Control longer jobs being lifted up from both ends.

xi) Only trained operators and riggers should carry out the job. While the crane is moving or lifting the load, the trained rigger should be there for keeping a vigil against hitting any other object.

xii) During high wind conditions and nights, lifting of heavy equipments should be avoided. If unavoidable to do erection in night, operator and rigger should be fully trained for night signaling. Also proper illumination should be there.

xiii) Allow crane to move on hard, firm and leveled ground.

xiv) When crane is in idle condition for long periods or unattended, crane boom should either be lowered or locked as per manufacturer's guidelines.

xv) Hook and load being lifted shall remain in full visibility of crane operators, while lifting, to the extent possible.

xvi) Don't allow booms or other parts of crane to come within 3 meters reach of overhead electrical cables.

xvii) No structural alterations or repairs should be made to any part of a lifting appliance, which may affect the safety of the appliance without the permission and supervision of the competent person.

6.9.2 Hoists

i) Hoist shafts should be enclosed with rigid panels or other adequate fencing at:

(a) ground level on all sides;
(b) all other levels at all points at which access is provided;
(c) all points at which persons are liable to be struck by any moving part.

ii) The enclosure of hoist shafts, except at approaches should extend where practicable at least 2mt above the floor, platform or other place to which access is provided except where a lesser height is sufficient to prevent any person falling down the hoistway and there is no risk of any person coming into contact with any moving part of the hoist, but in no case should the enclosure be less than 1mt in height.

iii) The guides of hoist platforms should offer sufficient resistance to bending and, in the case of jamming by a safety catch, to buckling.

iv) Where necessary to prevent danger, adequate covering should be provided above the top of hoist shafts to prevent material falling down them.

v) Outdoor hoist towers should be erected on firm foundations, and securely braced, guyed and anchored.

vi) A ladderway should extend from the bottom to the top of outdoor hoist towers, if no other ladderway exists within easy reach.

vii) Hoisting engines should be of ample capacity to control the heaviest load that they will have to move.

viii) Hoists should be provided with devices that stop the hoisting engine as soon as the platform reaches its highest stopping place.

ix) Winches should be so constructed that the brake is applied when the control handle is not held in the operating position.

x) It should not be possible to set in motion from the platform a hoist, which is not designed for the conveyance of persons.

xi) Winches should not be fitted with pawl and ratchet gears on which the pawl must be disengaged before the platform is lowered.

xii) Hoist platforms should be capable of supporting the maximum load that they will have to carry with a safety factor.

xiii) Hoist platforms should be equipped with safety gear that will hold the platform with the maximum load if the hoisting rope breaks.

xiv) If workers have to enter the cage or go on the platform at landings there should be a locking arrangement preventing the cage or platform from moving while any worker is in or on it.

xv) On sides not used for loading and unloading, hoist platforms should be provided with toe-boards and enclosures of wire mesh or other suitable material to prevent the fall of parts of loads.

xvi) Where necessary to prevent danger from falling objects, hoist platforms should be provided with adequate covering.

xvii) Counterweights consisting of an assemblage of several parts should be made of specially constructed parts rigidly connected together.

xviii) Counterweights should run in guides.

xix) Platforms should be provided at all landings used by workers.

xx) Following notices should be posted up conspicuously and in very legible characters:

(a) on all hoists:

- on the platform: the carrying capacity in kilograms or other appropriate standard unit of weight;
- on the hoisting engine: the lifting capacity in kilograms or other appropriate standard unit of weight;

(b) on hoists authorised or certified for the conveyance of persons:

- on the platform or cage: the maximum number of persons to be carried at one time;

(c) **on** hoists for goods only:

- on every approach to the hoist and on the platform: prohibition of use by persons.

xxi) Hoists intended for the carriage of persons should be provided with a cage so constructed as to prevent any person from falling out or being trapped between the cage and any fixed part of the structure when the cage gate is shut, or from being struck by the counterbalance weight or by articles or materials tailing down the hoistway.

xxii) On each side in which access is provided, the cage should have a gate fitted with devices which ensure that the gate cannot be opened except when the cage is at a landing and that the gate must be closed before the cage can move away from the landing.

xxiii) Every gate in the enclosure of the hoist shaft which gives access from a landing place to the cage should be fitted with devices to ensure that the gate cannot be opened except when the cage is at that landing place, and that the cage cannot be moved away from that landing place until the gate is closed.

6.9.3 Derricks

Stiff-leg derricks

i) Derricks should be erected on a firm base capable of taking the combined weight of the crane structure and maximum rated load.

ii) Devices should be used to prevent masts from lifting out of their seating.

iii) Electrically operated derricks should be effectively earthed from the sole plate or framework.

iv) Counterweights should be so arranged that they do not subject the backstays, sleepers or pivots to excessive strain.

v) When derricks are mounted on wheels:

a) a rigid member should be used to maintain the correct distance between the wheels;
b) they should be equipped with struts to prevent them from dropping if a wheel breaks or the derrick is derailed.

vi) The length of a derrick jib should not be altered without consulting the manufacturer.

vii) The jib of a scotch derrick crane should not be erected within the backstays of the crane.

Guy derricks

i) The restraint of the guy ropes should be ensured by fitting stirrups or anchor plates in concrete foundations.

ii) The mast of guy derricks should be supported by six top guys spaced approximately equally.

iii) The spread of the guys of a guy derrick crane from the mast should not be more than 45^0 from the horizontal.

iv) Guy ropes of derricks should be equipped with a stretching screw or turnbuckle or other device to regulate the tension.

v) Gudgeon pins, sheave pins and fool bearings should be lubricated frequently.

vi) When a derrick is not in use, the boom should be anchored to prevent it from swinging.

6.9.4 Gin poles

i) Gin poles should:

(a) be straight;
(b) consist of steel or other suitable metal;
(c) be adequately guyed and anchored;
(d) be vertical or raked slightly towards the load;
(e) be of adequate strength for the loads that they will be required to lift/move.

ii) Gin poles should not be spliced and if a gin pole is composed of different elements, they should be assembled in conformity with their intrinsic material strength.

iii) Gin poles should be fastened at their feet to prevent displacement in operation.

iv) Gin poles, which are moved from place to place and re-erected, should not be taken into use again before the pole, lifting ropes, guys, blocks and other parts have been inspected, and the whole appliance has been tested under load.

v) When platforms or skips are hoisted by gin poles, precautions should be taken to prevent them from spinning and to provide for proper landing.

6.9.5 Tower cranes

i) Where tower cranes have cabs at high level, persons, capable and trained to work at heights, should only be employed as crane operators.

ii) The characteristics of the various machines available should be considered against the operating requirements and the surroundings in which the crane will operate before a particular type of crane is selected.

iii) Care should be taken in the assessment of wind loads both during operations and out of service. Account should also be taken of the effects of high structures on wind forces in the vicinity of the crane.

iv) The ground on which the tower crane stands should have the requisite bearing capacity. Account should be taken of seasonal variations in ground conditions.

v) Bases for tower cranes and tracks for rail-mounted tower cranes should be firm and level. Tower cranes should only operate on gradients within limits specified by the manufacturer. Tower cranes should only be erected at a safe distance from excavations and ditches.

vi) Tower cranes should be sited where there is clear space available for erection, operation and dismantling. As far as possible, cranes should be sited so that loads do not have to be handled over occupied premises, over public thoroughfares, other construction works and railways or near power cables.

vii) Where two or more tower cranes are sited in positions where their jibs could touch any part of the other crane, there should be direct means of communication between them and a distinct warning system operated from the cab so that one driver may alert the other of impending danger.

viii) The manufacturers' instructions on the methods and sequence of erection and dismantling should be followed. The crane should be tested before being taken into use.

ix) The climbing operation of climbing tower cranes should be carried out in accordance with manufacturers' instructions. The free-standing height of the tower crane should not extend beyond what is safe and permissible in the manufacturers' instructions.

x) When the tower crane is left unattended, loads should be removed from the hook, the hook raised, the power switched off and the boom brought to the horizontal. For longer periods or at times when adverse weather conditions are expected, out of service procedures should be followed. The main jib should be slewed to the side of the tower away from the wind, put into free slew and the crane immobilised.

xi) A windspeed measuring device should be provided at an elevated position on the tower crane with the indicator fitted in the drivers' cab.

xii) Devices should be provided to prevent loads being moved to a point where the corresponding safe working load of the crane would be exceeded. Name boards or other items liable to catch the wind should not be mounted on a tower crane other than in accordance with the manufacturers' instructions.

xiii) Tower cranes should not be used for magnet, or demolition ball service, piling operations or other duties, which could impose excessive loading on the crane structure.

6.9.6 Lifting ropes

i) Only ropes with a known safe working capacity should be used as lifting ropes.

ii) Lifting ropes should be installed, maintained and inspected in accordance with manufacturers' instructions.

iii) Repaired steel ropes should not be used on hoists.

iv) Where multiple independent ropes are used, for the purpose of stability, to lift a work platform, each rope should be capable of carrying the load independently.

6.10 VEHICLE MOVEMENT

6.10.1 Park vehicles only at designated places. Don't block roads to create hindrance for other vehicles.

6.10.2 Don't overload the vehicle.

6.10.3 Obey speed limits and traffic rules.

6.10.4 Always expect the unexpected and be a defensive driver.

6.10.5 Drive carefully during adverse weather and road conditions.

6.10.6 Read the road ahead and ride to the left.

6.10.7 Be extra cautious at nights. Keep wind screens clean and lights in working condition.

6.10.8 All vehicles used for carrying workers and construction materials must undergo predictive/preventive maintenance and daily checks

6.10.9 Driver with proper valid driving license shall only be allowed to drive the vehicle

6.10.10 Routes shall be leveled, marked and planned in such a way so as to avoid potential hazards such as overhead power lines and sloping ground etc.

6.10.11 While reversing the vehicles, help of another worker should be ensured at all times

6.10.12 An unattended vehicle should have the engine switched off

6.10.13 Wherever possible one-way system shall be followed

6.10.14 Barriers/fixed stops should be provided for excavation/openings to prevent fall of vehicle

6.10.15 Load should be properly secured

6.10.16 The body of the tipper lorry should always be lowered before driving the vehicle off.

6.10.17 Signs/signals/caution boards etc. should be provided on routes .

6.11 ELECTRICAL

6.11.1 General Provisions

i) Only persons having valid licenses should be allowed to work on electrical facilities.

ii) No person should be allowed to work on live circuit. The same, if unavoidable, special care and authorisation need to be taken.

iii) Treat all circuits as "LIVE" unless ensured otherwise.

iv) Electrical "Tag Out" procedure "MUST" be followed for carrying out maintenance jobs.

v) Display voltage ratings prominently with "Danger" signs.

vi) Put caution/notice signs before starting the repair works.

vii) All electrical equipment operating above 250V shall have separate and distinct connections to earth grid.

viii) Proper grounding to be ensured for all switch boards and equipment including Portable ones prior to taking into service.

ix) Make sure that electrical switch boards, portable tools, equipments (like grinding machine etc.) don't get wet during their usage. If it happens, stop the main supply, make the tools dry and then only use them. Check proper earthing.

All temporary switch boards/ KIOSKS put up at work site should be suitably protected from rain and the level of same should be high enough to avoid contact with water due to water logging.

x) Don't work wet on electrical system.

xi) Don't overload the electrical system.

xii) Use only proper rated HRC fuses.

xiii) Industrial type extension boards and Plug sockets are only to be used.

xiv) ELCB for all temporary connections must be provided. Use insulated 3-pin plug tops.

xv) All power supply cables should be laid properly and neatly so that they don't cause hindrance to persons working and no physical damage also takes place to the cables during various construction activities.

xvi) All Power cables to be properly terminated using glands and lugs of proper size and adequately crimped.

xvii) Use spark-proof/flame proof type electrical fittings in Fire Hazard zones as per area classification under OISD-STD-113.

xviii) Check installations of steel plates/pipes to protect underground cables at crossings.

xix) Don't lay unarmored cable directly on ground, wall, roof or trees. All temporary cables should be laid at least 750 mm below ground and cable markers should be provided. Proper sleeves should be provided at road crossings. In case temporary cables are to be laid on wooden poles/steel poles, the minimum cable heights should be 4.5 M.

xx) Maintain safe overhead distance of HT cables as per Indian Electricity Rules and relevant acts.

xxi) Don't connect any earthing wire to the pipelines/structures.

xxii) Don't make any unsafe temporary connections, naked joints/wiring etc.

xxiii) Ensure that temporary cables are free from cuts, damaged insulation, kinks or improper insulated joints.

xxiv) Check at periodic intervals that pins of sockets and joints are not loose.

xxv) Protect electrical wires/equipments from water and naked flames.

xxvi) Illuminate suitably all the work areas.

xxvii) All switchboards should be of MS structure only and incoming source should be marked.

xxviii) Hand lamps should not be of more than 24V rating.

xxix) Fire extinguishers (DCP/CO_2/Sand buckets) should be kept near temporary switch boards being used for construction purposes. Don't use water for fighting electrical fires.

xxx) Insulating mats shall be provided in the front and back end of switch boards.

xxxi) All parts of electrical installations should be so constructed, installed and maintained as to prevent danger of electric shock, fire and external explosion.

Periodic checking/certification of electrical safety appliances such as gloves, insulating mats, hoods etc. to be done/witnessed along with maintaining a register at site signed by competent authority.

xxxii) A notice displaying following, should be kept exhibited at suitable places:

a) prohibiting unauthorised persons from entering electrical equipment rooms or from handling or interfering with electrical apparatus;
b) containing directions as to procedures in case of fire, rescue of persons in contact with live conductors and the restoration of persons suffering from electric shock;
c) specifying the person to be notified in case of electrical accident or dangerous occurrence, and indicating how to communicate with him.

xxxiii) No other cables/pipes to be laid in trench used for electrical cables.

xxxiv) Utmost care should be taken while excavating Earth from cable trench to avoid damage or any accident.

xxxv) Sub-station floor cut-outs meant for switch board installations to be covered wherever installation is incomplete.

NOTE: A Residual Current Operated Circuit Breaker (RCCB) or Earth Leakage Circuit Breaker (ELCB), when installed, protects a human being to the widest extent. RCCB or ELCB should be provided as per Indian Electricity Rules.

6.11.2 Inspection and maintenance

i) All electrical equipment should be inspected before taking into use to ensure suitability for its proposed use.

ii) At the beginning of every shift, the person using the electrical equipment should make a careful external examination of the equipment and conductors, especially the flexible cables.

iii) Apart from some exceptional cases, work on or near live parts of electrical equipment should be forbidden.

iv) Before any work is begun on conductors or equipment that do not have to remain live:

a) the current should be switched off by a responsible authorised person;
b) precautions should be taken to prevent the current from being switched on again;
c) the conductors or the equipment should be tested to ascertain that they are dead;
d) the conductors and equipment should be earthed and short-circuited;
e) neighbouring live parts should be adequately protected against accidental contact.

v) After work has been done on conductors and equipment, the current should only be switched on again on the orders of a competent person after the earthing and short-circuiting have been removed and the workplace reported safe.

vi) Electricians should be provided with approved and tested tools, and personal protective equipment such as rubber gloves, mats etc.

vii) All conductors and equipment should be considered to be live unless there is a proof of the contrary.

viii) When work has to be done in dangerous proximity to live parts the current should be cut off. If for operational reasons this is not possible, the live parts should be fenced off or enclosed by qualified staff from the sub-station concerned.

6.11.3. Testing

i) Electrical installations should be inspected and tested and the results recorded.

ii) Periodic testing of the efficiency of the earth leakage protective devices should be carried out.

iii) Particular attention should be paid to the earthing of apparatus, the continuity of protective conductors, polarity and insulation resistance, protection against mechanical damage and condition of connections at points of entry.

6.12 OFFSHORE

6.12.1 General

The isolated nature of offshore installations are hazardous. They call for greater need for safety and survival at offshore. Safety at offshore is safety of installations and safety of personnel. Safety problems and accidents at offshore have high risks due to limited space, helicopter operation, sea transport etc. Following are the general safety guidelines to be followed in addition to the safety guidelines stipulated for specific jobs dealt later on:

i) Workers should be well trained to do their job independently with high degree of self-control and self-discipline.

ii) On arrival at offshore, everyone should be briefed about the safety rules to be followed at offshore, evacuation system etc. All personnel should wear overall (dangri), helmet and shoes for personnel protection.

iii) In case of emergency, workers should follow instruction of Field Production Superintendent (F.P.S.) In certain cases instructions may be given to abandon the offshore installation and evacuate the persons to safe location.

iv) To overcome above problems, offshore personnel must receive training for using life saving appliances and other personal survival techniques.

v) Any person working at offshore should have one person as standby for any eventuality.

6.12.2 Drilling Rigs

i) Location of jack up rigs should not be less than 5 Kms from shipping route. Orientation of the rig, wind direction etc are required for safe landing of helicopter. Information w.r.t. sea currents, wind speed, Hi-lo tide etc are required for mooring of supply vessels.

ii) Sea bed condition at every location should be ensured for safety of rig.

iii) Radio and other communication facilities should be such to maintain contact with base all times.

iv) During toeing of rig, the rig deck should be clear of load, toeing lines should be in good condition and tensions in various toeing lines should be constantly monitored.

v) Few steps during toeing are:

a) crane booms should be secured to their vesta,
b) all hatches and water tight doors should be closed,
c) number of personnel on board should be restricted,
d) evacuate in case of emergency and operation should be completed preferably in day light.

6.12.3 Drilling

i) In view of CO_2 and H_2S gas cut from well, effective ventilation should be provided where drilling is in progress.

ii) Safety alarm shall be checked in advance in view of failure of ventilation system.

iii) Suitable sensors for H_2S and Methane should be function tested time to time and suitable colour code should be given.

iv) Working areas of the crane should be illuminated during night to avoid accident.

v) Clear space should be available for despatch and receipt of load and, in particular, basket transfer of passengers. Persons engaged in loading/unloading of materials should be protected from falling into the sea.

vi) Signal light should be fitted at the top of the jib.

vii) Crane hook should be fitted with safety latches.

viii) Experienced person should be engaged in operation of specific equipment like winches, cranes etc.

ix) At least three cable turns shall always be there on the winch drum.

x) Adequate communication like walkie talkie, round robin phone should be available between the crane operator, supervisor and helper.

xi) Crane operation should be completely stopped during helicopter landing/taking off.

xii) Except for helicopter landing deck, all decks, platforms, bridges, ladders should have rigid and fixed guard rails atleast one meter high and should have one intermediate rail midway between the handrail and 100 mm toe board.

xiii) Wooden ladders shall not be used at offshore.

xiv) Flow sensor in the flow line should be ensured for safe working and to avoid blow out.

xv) Hydrogen sulphuide gas In offshore is of great risk and at 10 ppm (0.001%) concentration in air, a person should not be exposed for more than 8 hours, If concentration is more, then breathing apparatus should be used. Corrosion of equipment is also caused by H_2S.

xvi) Portable H_2S gas detector should be continously used.

6.12.4 Production Platforms

i) In case hydrocarbon Is released due to overpressure, leak, overflow, gas blow etc., shut down process to stop flow **of** hydrocarbon. Prevent ignition of released hydrocarbon and in case of fire shut in the process complex and follow emergency contigency plan.

ii) Sub surface safetv valve (SSSV)) below the well head should be actuated during uncontrolled well -flow and they should be regularly checked.

iii) Surface safety valve or SDV should be checked for no gas leakage from bleed port / flange etc., in the well head area. It should not be in "mechanical override" or bypassed from panel.

iv) High pressure gas lift lines - blowdown system should be O.K.

v) Auto actuation of SDVs in the inlet of pressure vessels should be O.K. and in "normal position" from shutdown panels. A record of status of switches normal/bypassed in auto-con* panels (PSH, PSL, LSL, ILSL) should be maintained.

* Shut Down Panels

vi) Welders rectifier set and electrical connections to it should be checked and approved by electrical-in- charge for proper electrical safely.

vii) “SCADA" telementry system if available should be operational for remote opening and closing of wells at unmanned platforms (through RPMC).

viii) Local ESD/FSD (near the work site) should be provided for jobs of very critical nature, so that the persons working can access it immediately in emergency for safety. Safety officer should judge the requirement & inform FPS for the same.

ix) Railings and Gratings etc. in and around work area should be O.K. and inspected to avoid slippage of man into sea.

x) Emergency shut down (ESD) system is initiated when an abnormal condition is detected. ESD should be checked once in six months.

xi) Platform should be manned round the clock.

xii) Welding and cutting work should be regulated by hot work permit.

xiii) All detectors should be calibrated as per recommendation of the manufacturer.

xiv) No system should be by-passed which affects the system of platform.

xv) In H_2S field platforms, due care shall be taken as per recommendations.

xvi) Follow the instructions of F.P.S. during stay at platform

6.12.5 Fire Prevention And Control

i) Provision be made for safe handling and storage of dirty rags, trash, and waste oil. Flammable liquids and chemicals applied on platform should be immediately cleaned.

ii) Paint containers and hydrocarbon samples, gas cylinders for welding and cutting should be stored properly. Cylinders should be transported in hand-cart.

iii) Smoking should be restricted and no smoking area should be identified.

iv) Special attention should be given to crude oil pump seals, diesel and gas engines which are potential source of ignition in the event of failure.

v) Fire and smoke detectors i.e. ultraviolet heat, thermal and smoke detector should be function tested once in three months.

vi) Fire is controlled in offshore by water spraying, Halon, CO_2 flooding, DCP and sprinkler system.

vii) Foaming agent is applied for controlling fire in liquid hydrocarbon. The system is not effective in gas fire.

viii) Light weight breathing system should be used.

ix) The fire control plan at offshore should reveal control station, fire alarms and fire detectors, deluge valves and sprinkler, fire extinguishing appliances, fireman outfit and ventilation system.

x) Fire fighting equipment should be maintained in ready to use condition.

6.12.6 Life Saving Appliances

i) Life boats with a speed of 6 knots and carrying capacity upto 50 persons are used in offshore.

ii) No. of life boats on one installation should have a capacity to accommodate twice the number of persons onboard installation.

iii) Launching appliances and life boat equipment should be checked every week.

iv) Boat landing areas should be adequately illuminated.

v) Life raft has no power and they rely on drift.

vi) Life jacket lifts the wearer after entering water.

vii) Life buoys are used to rescue persons if any person accidentally falls in the sea.

viii) All life saving appliances should be inspected by the MMD surveyor /sr. officials once a year.

ix) Every life boat shall be inspected once a week.

x) Every life boat and life raft should be serviced once a year by a competent authority,

6.12.7 Safety Precautions during Helicopter Transportation

i) Passenger briefing regarding safety rules while travelling in helicopter should be carried out before boarding the helicopter.

ii) Emergency procedure should be briefed to all the passenger In case helicopter is to ditch into the sea.

iii) Heli-pad should have a non-skid surface. Nylon rope net should be stretched on the deck.

iv) Proper drainage should be available on helideck.

v) There should be no obstruction on the helideck itself and within 3 meters of its parameter. Closest super structure above the helideck should have red obstruction light.

vi) While landing fire crew of two persons should be standby adjacent to helideck.

vii) Heli-deck should be properly illuminated for night landing.

viii) During switching off helicopter, persons should not be allowed to go out/ towards helicopter

6.13 DEMOLITION

6.13.1. General provisions

i) When the demolition of any building or structure might present danger to workers or to the public:

(a) necessary precautions, methods and procedures should be adopted, including those for the disposal of waste or residues;
(b) the work should be planned and undertaken only under the supervision of a competent person.

ii) Before demolition operations begin:

(a) structural details and builders' drawings should be obtained wherever possible;
(b) details of the previous use should be obtained to identify any possible contamination and hazards from chemicals, flammables, etc.;
(c) an initial survey should be carried out to identify any structural problems and risks associated with flammable substances and substances hazardous to health. The survey should note the type of ground on which the structure is erected, the condition of the roof trusses, the type of framing used in framed structures and the load-bearing walls;
(d) a method of demolition should be formulated after the survey and recorded in a method statement having taken all the various considerations into account and identifying the problems and their solutions;

iii) All electric, gas, water and steam service lines should be shut off and, as necessary, capped or otherwise controlled at or outside the construction site before work commences.

iv) If it is necessary to maintain any electric power, water or other services during demolition operations, they should be adequately protected against damage.

v) As far as practicable, the danger zone round the building should be adequately fenced off and sign posted. To protect the public a fence 2m high should be erected enclosing the demolition operations and the access gates should be secured outside working hours.

vi) The fabric of buildings contaminated with substances hazardous to health should be decontaminated. Protective clothing and respiratory devices should be provided and worn.

vii) Where plant has contained flammable materials, special precautions should be taken to avoid fire and explosion.

viii) The plant to be demolished should be isolated from all other plant that may contain flammable materials. Any residual flammable material in the plant should be rendered safe by cleaning, purging or the application of an inert atmosphere as appropriate.

ix) Care should be taken not to demolish any parts, which would destroy the stability of other parts.

x) Demolition activities should not be continued under adverse climatic conditions such as high winds, which could cause the collapse of already weakened structures.

xi) To prevent hazards parts of structures should be adequately shored, braced or otherwise supported.

xii) Structures should not be left in a condition in which they could be brought down by wind pressure or vibration.

xiii) Where a deliberate controlled collapse technique is to be used, expert engineering advice should be obtained, and:

(a) it should only be used where the whole structure is to come down because it relies on the removal of key structural members to effect a total collapse;

(b) it should only be used on sites that are fairly level and where there is enough surrounding space for all operatives and equipment to be withdrawn to a safe distance.

xiv) When equipment such as power shovels and bulldozers are used for demolition, due consideration should be given to the nature of the building or structure, its dimensions, as well as to the power of the equipment being used.

xv) If a swinging weight is used for demolition, a safety zone having a width of at least one-and-a-half times the height of the building or structure should be maintained around the points of impact.

6.13.2. Demolition of structural steelwork

i) All precautions should be taken to prevent danger from any sudden twist, spring or collapse of steelwork, ironwork or reinforced concrete when it is cut or released.

ii) Steel construction should be demolished tier by tier.

iii) Structural steel parts should be lowered and not dropped from a height.

6.14 RADIOGRAPHY

6.14.1 All radiography jobs shall be carried out as per BARC Safety Regulations

6.14.2 During field radiography, nearby area around the radiation source should be cordoned off.

6.14.3 If the field radiography is to be done at the same location repeatedly, it is advisable to provide either a wire fencing around or a temporary brick enclosure.

6.14.4 Special permission/permit should be taken for radiography from area-in-charge.

6.14.5 As far as possible, field radiography should be done only during night time when there is little or no occupancy there.

6.14.6 Radiation warning signals should be pasted all along the cordoned off area.

6.14.7 Entry into the restricted area by unauthorised persons should be strictly prohibited during exposure.

6.14.8 The radiation level alongwith the cordon should be monitored by a suitable and well-calibrated radiation survey meter.

6.14.9 All personnel working with radiography sources should wear appropriate protective equipment and film badges issued by BARC.

6.14.10 Protection facilities such as manipulator rod, remote handling tongs, lead pots, radiation hazard placards and means of cordon off shall be available at each site.

6.14.11 The radiography source shall never be touched or handled directly with hands.

6.14.12 The package containing radiography cameras and sources should never be carried by public transport like bus, train etc.

6.14.13 Radiography sources and cameras, when not in use, should be stored inside a source pit with lock and key arrangement as approved by BARC. The storage room should preferably be located in an isolated area of minimum occupancy and radiation level outside the storage room should not exceed 0.25 mR/hr as per BARC Regulations.

6.14.14 In case of an accident (due to loss or of damage to radiography source), action should be taken in line with BARC Safety Rules/Guidelines.

6.15 SAND/SHOT BLASTING/ SPRAY PAINTING

6.15.1 Sand blasting should be used only after approval from competent person.

6.15.2 Air Compressor used for sand/shot blasting/painting should have guard and positioned away from the work place.

6.15.3 Exhaust of the prime mover, if IC engine is used, should be directed away from the work place.

6.15.4 In case of motor driven compressor, the body of the motor as well as the compressor to be properly earthed.

6.15.5 The hoses used for compressed air should be of proper quality, and health of the same to be ensured through regular check/ test.

6.15.6 The operator of sand/shot blasting/painting should wear suitable PPE's including mask.

6.15.7 Adequate measures to be taken to suppress dust/spray particle.

6.15.8 Sand used for sand blasting should be suitably covered & protected from to rain/moisture.

6.15.9 When these activities are done in confined places, adequate measure to be taken for proper ventilation.

6.16 WORK ABOVE WATER

6.16.1 General Provisions

i) Where work is done over or in close proximity to water & where possibility of drowning exists, provision should be made for:
   a) Preventing workers from falling into water;
   b) The rescue of workers in danger of drowning;
   c) Safe and sufficient transport.

ii) Provisions for the safe performance of work over or in close proximity to water should include, where appropriate, the provision and use of suitable and adequate:

   a) fencing, safety nets and safety harnesses;
   b) lifebuoys, life jackets and manned boats;
   c) protection against such hazards as reptiles and other animals.

iii) Gangways, pontoons, bridges, footbridges and other walkways or work places over water should:
   a) possess adequate strength and stability;
   b) be sufficiently wide to allow safe movement of workers;
   c) have level surfaces free from tripping hazards;
   d) be adequately lit when natural light is insufficient;
   e) where practicable and necessary, to prevent danger, be provided with toe-boards, guard rails, hand ropes etc.
   f) be secured to prevent dislodgment by rising water or high winds;
   g) if necessary, be equipped with ladders which should be sound, of sufficient strength and length and be securely lashed to prevent slipping.

iv) All deck openings including those for buckets should be fenced.

6.16.2 Rescue & Emergency procedures

i) Persons who work over water should be provided with some form of buoyancy aid. Life jackets should provided sufficient freedom of movement, have sufficient buoyancy to bring persons to the surface and keep them afloat face upwards, be easily secured to the body, be readily visible by way of self luminous paint/strip.

ii) Nobody should work alone on or above water.

iii) Each worker should be trained in the procedure to be followed in the event of an emergency.

7.0 ADDITIONAL SAFETY PRECAUTION FOR UNITS WITH HYDROCARBONS

In addition to general safety precautions as outlined above for the activities in Clause 6.0, following additional safety precautions need to be taken for the sites within the operating area or nearby, where presence of Hydrocarbons cannot be ruled out.

i) No job shall be carried out without a valid permit. Permit should be in line with OISD-STD-105 "Work Permit System".

ii) Smoking should be prohibited in all places containing readily combustible or flammable materials and "No Smoking" notices be prominently displayed.

iii) In confined spaces and other places where flammable gases, vapours or dusts can cause danger, following measures should be taken:

(a) only approved type electrical installations and equipment, including portable lamps, should be used;
(b) there should be no naked flames or source of ignition;
(c) oily rags, waste and clothes or other substances liable to spontaneous ignition should be removed without delay to a safe place;
(d) ventilation should be provided.

iv) Regular inspections should be made of places where there are fire risks. These include the vicinity of heating appliances, electrical installations and conductors, stores of flammable and combustible materials, welding and cutting operations.

v) Welding, flame cutting and other hot work should only be done after issuance of work permit in line with the requirement of OISD-STD-105 after appropriate precautions, as required, are taken to reduce the risk of fire. For carrying out other jobs also, OISD-STD-105 should be followed strictly.

vi) Fire-extinguishing equipment should be well maintained and inspected at suitable intervals by a competent person. Access to fire-extinguishing equipment such as hydrants, portable extinguishers and connections for hoses should be kept clear at all times.

vii) All supervisors and a sufficient number of workers should be trained in the use of fire-extinguishing equipment, so that adequate trained personnel are readily available during all working periods.

viii) Audio means to give warning in case of fire should be provided where this is necessary to prevent danger. Such warning should be clearly audible in all parts of the site where persons are liable to work. There should be an effective evacuation plan so that all persons are evacuated speedily without panic and accounted for and all plant and processes shut down.

ix) Notices should be posted at conspicuous places indicating:

(a) the nearest fire alarm;
(b) the telephone number and address of the nearest emergency services.

x) The work site shall be cleared of all combustible materials, as Sparks and molten metal coming from the welding job can easily ignite combustible materials near or below the welding site. If the combustible materials cannot be removed from the area, the same shall be properly shielded.

xi) A dry chemical type fire extinguisher shall be made available in the work area. Also fire protection facilities like running hoses etc. as per permit should be complied with.

xii) Wherever required, welding screens shall be put up to protect other equipment in adjoining areas against flying sparks. Material used should be metal/asbestos/water curtain.

xiii) Welding or cutting of vessels/ equipments used in Hydrocarbon/ hazardous chemicals shall be done after proper gas freeing and verifying the same with the explosive-meter.

xiv) The confined space/equipment shall be gas freed and cleaned.

xv) Absence of any toxic gas and any flammable gas above explosion limit shall be ensured with the help of gas detection instrument and explosive meter respectively.

xvi) Used and hot electrode stubs shall be discarded in a metal bucket.

xvii) Use approved and certified flame arrestors for vehicles.

xviii) Work permit to be obtained, if construction work is carried out within existing operating area.

8.0 FIRST AID

First aid facilities should be provided in line with various statutory regulations like factory act etc. However following care should be taken:

i) First aid, including the provision of trained personnel should be ensured at work sites. Arrangement should be made for ensuring the medical attention of the injured workers. First aid box should be as per the Factory rules.

ii) Suitable rescue equipment, like stretchers should be kept readily available at the construction site.

iii) First-aid kits or boxes, as appropriate and as per statutory requirements, should be provided at workplaces and be protected against contamination by dust, moisture etc.

iv) First-aid kit or boxes should not keep anything besides material for first aid in emergencies.

v) First-aid kits and boxes should contain simple and clear instructions to be followed, be kept under the charge of a responsible person qualified to render the first aid and be regularly inspected and stocked.

vi) Where the work involves risk of drowning, asphyxiation or electric shock, first-aid personnel should be proficient in the use of resuscitation and other life saving techniques and in rescue procedures.

vii) Emergency telephone numbers of nearby Hospitals, Police, Fire Station and Administration should be prominently displayed.

9.0 DOCUMENTATION

The intention of keeping documentation of all types of accident(s) is to prevent recurrence of similar accident(s). All accidents should be reported as per OISD Guidelines (OISD-GDN-107) and Factories act, 1948.

All accidents (major, minor or near miss) should be investigated, analysed and recommendations should be documented along with implementation status.

All related data should be well-documented and further analysis highlighting the major cause(s) of accidents be done. This will help in identifying thrust areas and training needs for prevention of accidents.

10.0 SAFETY AWARENESS & TRAINING

Safety awareness to all section of personnel ranging from site-in-charge to workmen helps not only preventing the risk but also build up the confidence. Time and expenditures also get saved as a result.

Safety awareness basically seeks to persuade/inform people on safety besides supplementing skill also. Awareness programme may include followings:

i) **Poster:** Posters with safety slogan in humorous, gruesome demonstrating manner may be used to discourage bad habits attributable to accidents by appealing to the workers'

pride, self-love, affection curiosity or human aspects. These should be displayed in prominent location(s).

ii) **Safety Sign Boards**: Different type of message of cautioning, attention, notice etc. should be displayed at the appropriate places for learning/ awareness of the workmen while working at site.

iii) **Films & Slides:** Film(s) narrating the accident including the causes and possible remedial ways of preventing the recurrence of a similar accident should be displayed at regular intervals. Slides consisting main points of the film show may also be shown to workers.

iv) **Talks, lectures & conferences:** The success of these events would depend much on audience's understandings of the speaker (s). The speakers are to be knowledgeable and good presenter. Speakers should know to hold the attention and to influence the audiences.

v) **Competitions:** Organise competition(s) between the different deptts/categories of workers. The sense of reward/recognition also will improve safety awareness and result in enhancing safety levels.

vi) **Exhibitions:** Exhibitions also make the workers acquainted with hazards and means of preventive measures.

vii) **Safety Publication:** Safety publications including pocket books dealing with ways of investigation and prevention in the field of safety and so on, may be distributed to workers to promote the safety awareness.

viii) **Safety Drives:** From time to time, an intensive safety drive by organising a safety day or a safety week etc. should be launched.

ix) **Training:** Training for covering the hazards for different trade should be imparted. Training should also include the specific hazards related to a job in addition to the general safety training as has been dealt in various chapters and should include all workers. Reference may be drawn from OISD-STD-154.

11.0 REFERRENCES

i) **Factory Act, 1948**

ii) **Indian Electricity Rules**

iii) **Safety & Health in Construction by ILO**

iv) **The Building & Other Construction Workers (Regulation, Employment and Conditions of Service) Act 1996**

ANNEXURE I

LIST OF SAFETY CODES FOR CIVIL WORKS PUBLISHED BY BUREAU OF INDIAN STANDARDS

Sr.no	Code No.	Title
01.	IS : 818	Code of Practice for Safety and Health Requirements in Electric and Gas Welding and Cutting Operations – First Revision.
02.	IS : 875	Code of practice for Structural safety of buildings: Masonry walls
03.	IS : 933	Specification for Portable Chemical Fire Extinguisher, Foam Type – Second Revision.
04.	IS : 1179	Specification for Equipment for Eye and Face Protection during Welding – First Revision.
05.	IS : 1904	Code of practice for Structural safety of buildings: Shallow foundations
06.	IS : 1905	Code of practice for Structural safety of buildings: Masonry walls
07.	IS : 2171	Specification for Portable Fire Extinguishers, Dry Powder Type – Second Revision.
08.	IS : 2361	Specification for Building Grips – First Revision.
09.	IS : 2750	Specification for Steel Scaffoldings.
10.	IS : 2925	Specification for Industrial Safety Helmets – First Revision.
11.	IS : 3016	Code of Practice for Fires Precautions in Welding and Cutting Operations – First Revision.
12.	IS : 3521	Industrial safety belts and harnesses
13.	IS : 3696 – Part I	Safety Code for Scaffolds and Ladders : Part I – Scaffolds.
14.	IS : 3696 – Part II	Safety Code for Scaffolds and Ladders : Part II – Ladders.
15.	IS : 3764	Safety Code for Excavation Work.
16.	IS : 4014 -Part I & II	Code of practice for Steel tubular scaffolding
17.	IS : 4081	Safety Code for Blasting and Related Drilling Operations.
18.	IS : 4082	Recommendations on staking and storage of construction materials at site
19.	IS : 4130	Safety Code for Demolition of Buildings – First Revision.
20.	IS : 4138	Safety Code Working in Compressed Air-First Revision
21.	IS : 4756	Safety code for Tunneling works
22.	IS : 4912	Safety requirements for Floor and Wall Openings, Railings and toe Boards –First Revision.
23.	IS : 5121	Safety Code for Piling and other Deep Foundations.
24.	IS : 5916	Safety Code for Construction involving use of Hot Bituminous Materials.
25.	IS : 5983	Specification for Eye Protectors – First Revision.
26.	IS : 6922	Structures subject to underground blasts, criteria for safety and design of

27.	IS : 7155	Code of recommended practices for conveyor safety
28.	IS : 7205	Safety Code for Erection on Structural Steel Works.

Sr.no	Code No.	Title
29.	IS : 7069	Safety Code for Handling and Storage of Building Materials.
30.	IS : 7293	Safety Code for Working with Construction Machinery.
31.	IS : 7323	Guidelines for operation of Reservoirs
32.	IS : 7969	Safety code for handling and storage of building material
33.	IS : 8758	Recommendation for Fire Precautionary Measures in construction of Temporary Structures and Pandals.
34.	IS : 8989	Safety Code for Erection of Concrete Framed Structures.
35.	IS : 9706	Code of Practices for construction of Arial ropeways for transportation of material
36.	IS : 9759	Guidelines for de-watering during construction
37.	IS : 9944	Recommendations on safe working load for natural and man-made fibre roap slings
38.	IS : 10291	Safety code for dress divers in civil engineering works
39.	IS :10386 – Part I	Safety Code for Construction, Operation and Maintenance for River Valley Projects.
40.	IS :10386 – Part II	Safety Code for Construction, Operation and Maintenance of River Valley Projects.
41.	IS : 11057	Code of practice for Industrial safety nets
42.	IS : 13415	Code of Practice on safety for Protective barriers in and around building
43.	IS : 13416	Recommendations for preventive measures against hazards at working places

OISD – GDN – 207

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CONTRACTOR SAFETY

OISD – GUIDELINES – 207

Oil Industry Safety Directorate
Government of India
Ministry of Petroleum & Natural Gas

CONTRACTOR SAFETY

CONTENTS

CONTRACTOR SAFETY

1.0 INTRODUCTION

Oil and Gas operations like Drilling, Production, Refining, Transportation and Distribution are inherently hazardous. A large number of contractor workforce is deployed to carry out construction, maintenance and other jobs. The analysis of the incidents in the Petroleum Sector indicates that a large number of incidents involved contractor workforce and have resulted in either casualty or injury besides leading to property damage and operational interruptions and environmental degradation.

In order to improve the safety levels of oil installations, the contractor safety is of utmost importance and there is a need to institute a good contractor safety system.

2.0 SCOPE

This standard covers broadly the guidelines on the management system for enhancing the safety levels of the contractor workforce deployed in construction, maintenance and operation activities in the hydrocarbon industry.

The safety precautions to be taken while carrying out different activities during construction / maintenance have separately been covered in OISD-GDN-192 on "Safety Practices during Construction".

3.0 DEFINITIONS

Work station/Work site

A place/unit where the job is carried out by contractor/executing agency in specified manner with safety, during construction phase or in operation phase.

Owner

Any physical or legal person/entity for whom prescribed job is carried out.

It shall also include owner's designated representative / consultant /nominee / agent, authorised from time to time to act for and on its behalf, for supervising / co-ordinating the activities of the contractor/execution agency.

Contractor / Executing Agency

A physical or legal person/entity having contractual obligation with the owner, and who deploys one or more worker on the site.

Contractor Worker

It covers all workmen who are either self-employed or employed through contractor, the casual workers and includes contractor's supervisor, working at a location / site employed directly by Owner or through their contractor.

Incident

An incident is an unplanned, uncontrolled, unintended or unforeseen event, caused by unsafe acts and / or unsafe conditions, resulting in or having the potential to result in personal injury and/or property damage.

Consultant

Consultant is a physical or legal person/entity engaged by owner to provide the consultancy services to owner for management of the contract on their behalf or as specified.

Designer

Designer is a physical or legal person / entity engaged by owner to provide design services of a work site.

Owner's Representative / Engineer In Charge

The Owner's representative/Engineer-in-charge is the one, who has been designated by the owner to manage the contract.

Owner's Safety Officer

A properly trained person designated by owner who ensures safety at work site.

4.0 DUTIES/ RESPONSIBILITIES

4.1 OWNER

4.1.1 Owner's Management

The commitment to safety has to be emphasised by the owner by practice by its own management and employees at all levels. The duties and responsibilities of owner should include:

i) To institute a mechanism for identification and compliance of all applicable statutory rules & regulations (Refer Annexure I for a list of few important Bureau of Indian Standards & statutory regulations).

ii) To provide specific information to contractors and make workers aware on the hazards associated with job assigned.

iii) To provide information about Risk Mitigation measures available at the place of work.

iv) To provide the contractor with information on Owners Safety Plan & Regulations, Emergency Management Plan, lockout/ tag out procedure, confined space entry, work permit system, excavation/trench permit system etc.

v) To specify rules (e.g. for security including access arrangements) and safety rules such as fire protection, first aid arrangements, Work Permit systems etc.

vi) To provide comprehensive list of statutory regulations / standards and specification, to be complied with during execution of contract, in the tender document itself.

vii) To ensure training of the contractor workforce, medical examination, and proper usage of safety equipment.

viii) To specify the requirements of Health, Safety and Environment (HSE) (commensurate with the nature of job) in Pre- Qualification criteria.

ix) To designate Engineer-in-charge and safety officer.

x) To arrange for a multi-disciplinary safety audit team to conduct surprise / regular safety audits and monitor the implementation of the recommendations.

xi) To introduce suitable schemes for motivation of the contractor worker to adhere to safety guidelines.

xii) To review safety practices & their implementation through periodic surprise visit of the work sites and monthly review meeting.

xiii) To develop the HSE plans and incorporate the same in the tender document.

xiv) To liaise with external agencies like press, public etc and with law enforcement, regulatory, statutory agencies etc.

xv) To report to statutory agencies on safety compliance and accidents, if any.

4.1.2 Owner's Representative/Engineer-in-charge

The duties & responsibilities of engineer-in-charge should include:

i) To ensure that all Contract requirements including Health, Safety, Environment & Security are complied with.

ii) To ensure that contractor workforce deployed is adequately qualified, trained and in state of health to commensurate with the requirements of the job.

iii) To ensure that the Tools / Tackles and Machinery being used are properly

tested and are in sound working conditions and necessary resources proposed for providing safe place of work and necessary PPE are being used.

iv) To take the required necessary corrective action immediately upon noticing or receipt of a report on noncompliance or any such condition which poses a threat to health, safety or environment. If during the course of execution of the contract, any situation of non-compliance with the contractor's safety and health plan are noticed / reported, the same will be taken up with the contractor for correction. In the event of repeated non compliance, suitable action to be initiated as per the contract.

v) To ensure that the incidents are reported to all concerned within stipulated timeframe.

vi) To ensure submission of a plan for safe working (Method Statement) from contractor and approval of the same by competent person / department.

vii) To ensure that Work Permit System in line with OISD-STD-105 is adhered to.

viii) To ensure availability of all the documentation needed for the execution of contract.

ix) To ensure that the quality controls have been maintained during fabrication/erection and all jobs required for safe commissioning have been carried out.

x) To ensure safe dismantling of all temporary facilities/connections put up by the contractor, after completion of work.

xi) To compile a report on the safety performance (at the conclusion of each contract or periodically such as annually for renewable and long-term contracts), which is to be considered in future when selecting contractors.

xii) To ensure that the Consultant, contractor and sub-contractor employ / designate qualified & trained Safety Engineer / Officer commensurate with requirement of the job.

4.1.3 Owner's Safety Officer

The duties & responsibilities of the Owner's Safety Officer should include:

i) To assess the hazards associated with jobs in consultation with all concerned and establish safe working procedure including identification of the escape routes.

ii) To establish a written record of factors which can cause injuries and illnesses.

iii) To undertake routine/surprise inspections of all work sites and identify unsafe conditions & practices, if any. Check for compliance of the safety practices being followed with approved HSE Plan.

iv) To investigate promptly the incidents (including near-miss) in order to advise corrective and/or preventive action.

v) To maintain statistical information for use in analyzing all phases of incidents and events involving contract personnel.

vi) To provide the means for complying with the reporting requirements for occupational injuries and illnesses.

vii) To check whether the proposed working arrangements are safe and satisfactory, particularly at the interface between the contractor's planned work and owner’s existing facilities.

viii) To communicate to the Contractor the imposed restrictions which may affect the work/personnel such as the temporary closure of a corridor or electrical isolation of equipment.

ix) To review and monitor the contractor's adherence to approved HSE plan and all applicable environmental, health, and safety requirements.

x) To ensure that Consultant, Contractor's Managers, Supervisors and workmen at all levels (who will plan, monitor, oversee and carry out the work) undergo Health, Safety and Environmental training in their respective responsibilities with respect to conducting work safely and with due regard for the protection of the environment.

xi) To identify areas of operations where specialized training is required to deal with potential dangers.

xii) To document and to bring to the attention of the Owner's Supervisor and Contractor any non-compliance/violation of the safety norms against approved safety and health plan or safety and health requirements and also raise these issues in the Safety Committee Meetings.

xiii) To take part in Tool Box Meetings at random and to ensure maintenance of records.

4.2 CONTRACTOR

4.2.1 Contractor's Management

Duties & responsibilities of the contractor should include the following:

i) To implement safe methods and practices, deploy appropriate machinery, tools & tackles, experienced supervisory personnel and skilled work force etc. required for execution.

ii) To prepare a comprehensive and documented plan for implementation, monitoring and reporting of Health, Safety and Environment (HSE) and implement the same after its approval.

iii) To nominate qualified & trained Safety Engineers / Officers reporting to the Site in charge, for supervision, co-ordination and, liaison for the implementation of the safety plan.

Similar HSE Plan should be implemented at the sub- contractor's or supplier's site /office. However the compliance with the HSE Plan is to be the sole responsibility of the Contractor.

iv) To arrange suitable facilities in liaison with the owner for drinking water, toilets, lighting, canteen, crèche etc as applicable as per Laws/ Legislation at site and also arrange for workmen compensation insurance, third party liability insurance, registration under ESI / PF act etc as applicable.

v) To arrange for fire protection equipment as per the advice of owner.

vi) To ensure that its employees have completed appropriate health and safety training as required by the statute / regulation and also as per requirements of the Owner / Consultant. The documentation of such training imparted to all its employees should be maintained and produced for verification as required.

vii) To comply with all the security arrangements of owner.

viii) To ensure that the plant and equipment used on-site by him / his employees is correctly registered, controlled and maintained in sound working condition.

ix) To ensure availability of First Aid boxes and First Aid trained attendant.

x) To ensure that all incidents including near misses are reported to all concerned immediately.

In construction projects where sub-contractors are engaged, the contractor should set out the responsibilities, duties and safety measures that are expected of

the sub-contractor's workforce. These measures should include the provision and use of specific safety equipment, methods of carrying out specific tasks on safety and the inspection and appropriate use of tools.

The responsibilities indicated separately under contractor's Supervisor, Safety Officer and contract worker are contractually that of the Contractor and legally binding on the Contractor only. However the specific detailing as above has been given separately for guidance and operational convenience.

The selection of sub contractors, if employed, should be approved by the owner. Sub-contractor should comply fully with all safety rules and conditions applicable to the main contractor.

4.2.2 Contractor's Supervisor / Safety Officer

Duties & responsibilities of the Contractor's supervisor/Safety Officer should include the following:

i) To ensure strict compliance with work permit system by carrying out work only with appropriate work permits and after ensuring that all safety precautions / conditions in the permit are complied with and closing the same after job completion.

ii) To ensure that required guards and protective equipment are provided, used, and properly maintained.

iii) To ensure that tools and equipment are properly maintained and tested.

iv) To plan the workload and assign workers to jobs in commensuration with their qualification, experience and state of health.

v) To ensure that the workers understand the work to be done, the hazards that may be encountered, and the proper precautions/procedure for carrying out the work safely.

vi) To take immediate action to correct any violation of safety rules observed or reported.

vii) To ensure that the workers likely to be exposed to hazardous chemicals/materials have access to appropriate Material Safety Data Sheets (MSDS), wherever applicable, and provide necessary mitigation measures.

viii) To ensure inspection and certification of all tools (hand operated as well as mechanically operated) being used. Defective tools shall be immediately removed.

ix) To ensure that appropriate warning signboards or tags are displayed.

x) To ensure that workers have proper training for their job assignments, including use of appropriate PPE and first aid fire fighting equipment.

xi) To comply with all applicable safety and health standards, rules, regulations and orders issued by competent authority pertaining to the assigned activities.

xii) To ensure that sick and/or injured workers receive appropriate first aid and/or medical attention.

xiii) To report each incident and/or injury in accordance with established procedures and assist in investigation.

xiv) To take necessary action for correction of any unsafe act / condition at the workplace. However, in case the same is outside the limits of authority, it should be reported to Owner's Engineer-in-charge immediately.

xv) To conduct daily inspections to ensure compliance with safety standards, codes, regulations, rules and orders applicable to the work concerned.

xvi) To ensure that workers under their supervision are aware of their responsibilities.

xvii) To arrange daily tool box meeting and regular site safety meetings and maintain records in the required formats. (Refer Clause 5.9.1)

xviii) To arrange stand-by supervisor/ worker where situations so demand.

xix) To develop methods and display banners/posters to inculcate safety consciousness.

xx) To attend training and ensure participation of his workers for training as per schedule arranged by the Owner / Consultant and keeps himself updated.

xxi) To keep records of number of persons working at the site.

xxii) To keep a constant liaison with Engg-in-charge / owners' representative on safety issues.

xxiii) To maintain accident & nearmiss record in a register.

xxiv) To ensure that only PPE of the approved type by owner is used at site.

A separate Safety Officer should be assigned, where more than 100 workers are employed at site. For smaller jobs, the supervisor should assume the role of the safety officer also.

4.2.3 Contract workers

The duties & responsibilities of the contractor worker should include the following:

i) To perform work safely as per the job requirement and instructions.

ii) To inform all concerned regarding unsafe conditions/acts.

iii) To wear PPE as stipulated and necessary for the job.

iv) To inform promptly to their supervisor regarding all work related incidents resulting in personal injury, illness and/or property damage.

v) To take all necessary and appropriate safety precautions to protect themselves, other personnel and the environment.

4.3 CONSULTANT

The activities and responsibilities covered under the scope of the Owner may be delegated to the consultant in those cases as applicable, based on the respective contract conditions. The primary responsibility of Consultant is to ensure compliance with agreed HSE plan for the contract by the Contractor. However those responsibilities conferred on Owner as Principal employer cannot be delegated to consultant.

Where the consultant's scope involves Engineering and Design, those factors under **Designer** should also be applicable.

In all cases, the Consultant's scope should include submission of latest HSE plans for work under his and Contractor's purview and implementing the same till job completion. It should conform to owner's overall HSE plan. This should include Guidelines and Implementation and Reporting Methodology to be followed with required report formats.

Adequate number of Safety Officers shall be provided by the Consultant with necessary skills required for the work to be performed.

The Consultant shall review the documents submitted by the contractor and advise owner on acceptance as well as advise suitability and number of Contractor's safety officers / supervisors.

4.4 DESIGNER

The Process Designer should identify all hazards and risks likely to be encountered during fabrication, erection including

dismantling, Pre-commissioning, commissioning and Performance run to meet the Guarantees and advise the risk mitigation measures.

All the hazards and safety measures to be adopted while handling Dangerous chemicals and Catalysts should be detailed by the Process Licensor and the same should be again included in the scope of the suppliers. Specific write ups/MSDS should be obtained from Patented single source suppliers also.

Designs should recognize, include and apply safe practice during preparation, construction and subsequent operational use and maintenance after completion of the Project.

All documents including drawings and calculations are to be originated, checked and approved in accordance with latest international codes, standards, specifications and design basis philosophy.

Preferred use of low risk materials, policy on hazardous substances, preferred use of low noise and dust-suppressed equipment etc. should be encouraged.

5.0 SAFETY MANAGEMENT

5.1 JOB SAFETY ANALYSIS (JSA)

Job safety analysis (JSA) provides a mechanism by which the contractor, safety officer or supervisor take a detailed look at how an individual task is performed and its inherent hazards and preventive measures. This procedure helps in integrating accepted safety and health principles and practices into a particular operation. In a JSA, each step of the job is examined to identify potential hazards and to determine the safest way to do the job.

A job safety analysis includes five steps as below:

- Select a job
- Break the job down into a sequence of steps
- Identify the hazards against each of these steps (based on knowledge of accident, causes of injuries and personal experience) and determine the preventive measures to overcome these hazards
- Apply the controls to the hazards
- Evaluate the controls

5.2 CRITERIA OF SELECTION OF A CONTRACTOR

“Contractor Safety” can be ensured to a large extent if competent agency for execution of assignment or job, based on HSE system agreed upon by owner, is selected. It is necessary to assess his capabilities and competencies to perform work safely.

A databank should be developed for all the contractors for their past performance on HSE aspects. An attempt should also be made to get similar data from other similar industries.

The data required will depend upon complexity involved in the job and type / size of resources required. Format needs to be suitably developed depending upon size, nature of the job & hazard associated therein. The format designed should also take care of the skill required to carry out the job.

Performance review is essential for all type of contractors. It helps in recording actual performance/experience with contractors while the contract is in progress. It is essential that resources agreed as per the contract are reviewed at mobilization stage for ensuring compliance from the day one and thorough effective supervision / monitoring system are at place.

This activity also helps in taking timely action in case of unsatisfactory performance to correct the situation and ensure safe work during execution period and deciding about suitability of the contractor for future jobs.

The periodicity of such performance review will depend upon size/type/complexity of contract. However, the performance should be reviewed at least at mobilisation stage and at the end of the contract.

5.3 SITE PLANNING AND LAYOUT

Before starting the construction/maintenance job at existing workplace in operation or green field locations, following should be ensured: -

i) Details regarding location of workshop/ fabrication yard, site office, stores, laboratory, electrical installations, placement of construction machinery, medical and welfare facilities, lighting underground and above ground piping route, cable route etc. should be decided prior to commencement of the work in consultation with owner / Consultants and implementation should be ensured. Layout should be displayed at strategic locations.

ii) The resources required to meet any emergency situations like fire fighting, first aid etc. should be planned and mobilized as per the job requirement.

iii) The sequence or order in which work to be done and any hazardous operations or processes should be identified.

iv) Free access to site shall be provided with clear roads, passage, gangways, staircases etc. Access to construction site should be leveled, open and free from any obstructions like construction material or scrap/waste, exposure to hazards such as falling materials, material handling equipment and vehicles. Any pit or ditch shall be covered or barricaded.

v) Arrangements should be made to maintain good housekeeping at site. Scrap and debris generated out of construction work should be removed/disposed off at a regular interval as directed. Emergency exit should be provided in case of blockade of primary exit.

vi) Suitable warning notices and also the routes to and from welfare facilities should be displayed prominently.

vii) Pedestrian pathways and routes for vehicular traffic (light/heavy vehicles including material handling equipment) should be earmarked.

viii) Artificial lighting to be provided at places where work continues or workers pass by after sunset or in case natural light is insufficient like confined spaces.

ix) Keep all equipment /machines under cover to prevent them from dust, rain/flood water, heat etc. and follow storage instructions as applicable for each of them.

5.4 GATE ENTRY PROCEDURE

Gate entry at any site / workplace / unit is to be restricted to ensure entry of only authorised persons / vehicles.

5.4.1 Entry procedure for all contractor worker should be as follows:

A. Issuance of Pass

i) The passes are to be issued after the owner's representative/engineer-in-charge forwards the application of the contractor providing complete details of the workers being engaged. The contractor may be asked to submit Character & Antecedents (C&A) verification of individual worker from concerned authorities.

ii) With regard to issuance of passes for all vehicles including material handling equipment, owner's representative / engineer-in-charge should forward the application only after ensuring that all documents pertaining to the fitness of the vehicle/equipment and valid driving license of the driver etc. are available.

iii) The passes should be serially numbered with address, contractor name, identification mark, signature of the worker etc.

iv) Special colour code for passes should be used for persons entering different

areas like Administrative Block, Unit area, Project Area (wherever applicable).

v) Contractor workers engaged on routine basis for long periods should be provided with monthly photo pass.

vi) Special permit is required separately for working beyond normal working hours and holidays.

B. Gate Entry

i) Entry of the contractor's employees should be permitted with valid gate passes only.

ii) Entry of contractor's workers should be allowed in presence of authorized representative of contractor.

iii) Records of persons at the time of entry/exit should be maintained.

iv) At the entry gate of the location, a physical checking for non-carrying of lighter, matchboxes, explosives etc. should be carried out.

v) Gate passes/Identity Cards should be displayed on persons at all the times.

vi) For Mega-projects at existing / operating installations, it is preferable to have a separate gate for entry of contractor workers and also the project areas should be segregated fencing from operational area by fencing / other physical means.

vii) No vehicle should be allowed to enter in an operational area without proper flame arrestor.

viii) Awareness on Safety through training / posters etc. highlighting Do's and Don'ts should be spread within entire contractor workforce. Video/Audio tapes on Safety Topics should be played preferably.

ix) For occasionally engaged labourers such as for material handling etc., spot photograph may be preferably taken with two copies (one for preparing the pass and other for attachment with gate register). Specific advice and recommendation of User Department may be given due cognizance. Relevant details are to be written. The pass should be collected back at the gate after day's work.

5.4.2 Tank Truck Loading (TTL) Operation :

At the loading / unloading location, a large no. of Tank Trucks of petroleum products enter the installation. Crew members are generally not regular entrants. The procedure should be as follows:

i) The gate pass should be issued to the individual crew members on written request of the transporter mentioning TT registration nos., License and certificate of training as per MV rule 9.

ii) Character & Antecedent (C & A) verification of the TTL crew through local police is to be done preferably and record maintained.

iii) For loading/unloading purpose, register entry at security gate is made before allowing entry into the premises with recording of names of crew members, time of entry, pass Sr. No., TT no. etc.

iv) For loading/unloading, crew is allowed entry alongwith TT only, after checking of TT from explosive/security point of view.

v) Out time, invoice no., Destination etc., are recorded while TTs go out of the security gate.

5.5 TRAINING

Training is to educate contractor workforce on various hazards associated with the job/workplace and on the respective preventive / mitigation measures to avoid untoward incidents.

i) Workers should be adequately and suitably:

(a) informed of potential safety and health hazards to which they may be exposed to at their workplace;

(b) instructed and trained in the measures available for the prevention, control and protection against those hazards.

ii) No person should be employed in any work at a workplace unless that person has received the necessary information, instruction and training so as to be able to do the work competently and safely. The competent authority should, in collaboration with employers, promote training programs to enable all the workers to read and understand the information / instructions related to safety and health matters.

iii) The information, instruction and training should be given in a language understood by the worker and written, Oral, visual and participative approaches should be used to ensure that the worker has assimilated the information.

iv) Every worker should receive instruction and training regarding the general safety and health measures common to the workplace. This should include:

(a) general rights and duties of workers at the workplace;

(b) means of access and egress both during normal working and in an emergency;

(c) measures for good housekeeping;

(d) location and proper use of welfare amenities and first aid facilities provided;

(e) proper use and care of the items of personnel protective equipment and protective clothing provided to the worker;

(f) general measures for personal hygiene and health protection;

(g) fire precautions to be taken;

(h) action to be taken in case of an emergency;

(i) requirements of relevant safety and health rules and regulations.

Copies of the relevant safety and health rules, regulations and procedures should be available to workers upon the commencement of and upon any change of employment.

5.5.1 Training Techniques

a) Lectures

This technique should be applied when it is required to transfer information in local language to a large contractor workforce with controlled content and time.

b) Case Study

This is an effective technique based on the presentation of case of real events by Trainer to highlight probable causes like Human Error, ignorance about the job etc.

c) Videos

Videos, an effective technique of communication, should be used to display the right techniques of performing a task in a safe manner and hazards associated with a job.

d) Demonstration at site

Right way to do a job should invariably be demonstrated to workers at the site itself. The right way is also a safe way. Hazards due to wrong procedures, short cuts and their adverse effects etc. should also be highlighted.

5.5.2 Training/Awareness Module and Frequency

A. General Safety Training to all categories of contractor employees should be imparted before induction and annually thereafter. No person should be allowed to enter the installation without undergoing this training. This training program may cover:

i) Mandatory uses of PPE like Cotton clothes, Helmet, Safety Shoes, Safety Belts etc.

ii) Probable Hazards

iii) Important Telephone No / Escape route

iv) First Aid

v) Use of Fire extinguisher

The contractor workers, if engaged in operation of the plants/facilities, should be trained in line with Clause No. 4.6 of OISD-GDN-206 on “Safety Management System”. For other categories of contractor workers, training modules for different category employees are as follows:

B. Contractor Supervisor

Contractor Supervisor should be trained in accordance with the provision of clause no. 5.1.1.2, 5.2.7, 5.3.10, 5.6.12 and 5.7.8 of OISD-STD-154 on 'Safety Aspects in Functional Training'

C. Contractor Worker

Yearly training programme should be carried out for contractor worker and the records should be maintained. The training programme should cover at least the following:

i) Worker responsibility for safety of himself and work area.

ii) Associated hazards with the job and job area including electrical shock hazards.

iii) Importance of First Aid fire fighting equipment, their use & operations

iv) Communication system at the installation

v) Fire / Accident Reporting procedure

vi) General Safety rules

vii) Safety Measures during execution of job such as:

- Welding / Cutting / Grinding
- Working at height
- Confined space entry
- X ray / radiation
- Erection / Dismantling of scaffolding
- Tank construction and repairs
- Handling of chemicals etc.

viii) Importance & use of PPE

ix) Emergency Routes

x) Assembly Points

xi) Job Specific Training

D. Consultant / Contractor

Awareness program should be carried out for Consultant / Contractor at the time of induction. This program should cover at least the following:

i) Responsibility of contractor for safety of their personnel and work area

ii) Hazardous property of Petroleum products and chemical used

iii) Communication system

iv) Fire / Accident Reporting procedure

v) Medical facility available

vi) Statutory requirements

vii) Importance of First Aid equipment and required at the site

viii) Work Permit system

ix) Direct/ Indirect losses due to accident

x) Safety Measures while executing the jobs such as:

- Welding / Cutting / Grinding
- Working at height
- Confined space entry
- X ray / radiation
- Erection / Dismantling of scaffolding
- Tank construction and repairs
- Handling of chemicals etc.
- electrical jobs

xi) Safety training needs of their supervisors and workers

xii) Importance & Use of PPE at the site

xiii) General Safety rules at the installation

E Security Personnel

Training program should be carried out for Security personnel at the time of induction and annually thereafter and the records should be maintained. The training program should cover at least the following:

i) Layout of Plant and Facilities
ii) Vulnerable locations
iii) Safety regulations (Statutory and in company)
iv) Fire Protection Facilities and Locations
v) Role in case of Fire / Disaster
vi) Emergency Procedure and Drills
vii) Industrial First Aid
viii) Use of Personnel Protective Equipment
ix) Disaster Management Plan

5.6 INSPECTION / AUDIT

Inspection / Audit is a tool to evaluate compliance of all safety requirements. Most of the information could be gathered through site inspection using ready-made check lists to ensure that contractors / agencies abide by the safety rules and norms while working at operating / construction sites.

A checklist, while carrying out different type of jobs, should be developed based on hazards associated with the job being performed and requirements as per OISD-GDN-192 on "Safety Practices during Construction". Typical format is enclosed at Annexure II, which should be modified to suit the requirement of the site / job to be done.

Before starting the work and at regular intervals thereafter, Contractor's Supervisor/safety Officer and Owner's representative / Engineer-in charge/safety Officer should inspect as per the checklist so prepared to ensure that contractor has prepared to start the work with all safety precaution required for safe execution of job.

5.7 PENALTIES FOR NON-COMPLIANCE

Financial or other type of penalties like seizure of gate passes, stoppage of work for a limited period etc. may be levied on the contractors or their workers for non-compliance of safety rules. A provision of suitable accident severity based penalty clause for contractor may be incorporated to ensure adherence of systems and procedures. A few of the usual non-compliance are as follows:

-- Non-usage of PPEs like Safety helmet / Safety shoes / Safety goggles / Respiratory protection etc. by the contractor personnel

-- Non-usage of the safety belt and life line by the workers while working at height

-- Non-provision of basic safety requirement such as 24 V lamp for working in confined space, uncertified / non standard lifting tools, earth leakage protection & earthing connections for electrical appliances as per Indian Electricity Rules, emergency isolation switches etc.

-- Violation of Safety Permit conditions like Fire fighting equipment

-- Non-barricading of area while rigging, digging etc.

-- Working without valid work permit

-- Unauthorised road closure/blockage

5.8 INCIDENT REPORTING AND INVESTIGATION SYSTEM

All the incidents including near-miss should be reported immediately by contractor's Supervisor to Contractor and owner's Supervisor/Engineer-in-charge, who should inform to Owner's Safety Officer and owner's Management. Owner's Safety Department will be required for onward reporting as per OISD, Statutory requirements.

All accidents regardless of the extent of injury or damage should be investigated in order to find probable causes, lessons learnt thereof and remedial measures required to prevent its recurrence.

The incident investigation should be done as per provision of clause no. 4.12 of OISD-GDN-206 on 'Safety Management System' . All the recommendations of investigation / Enquiry Report need to be monitored closely for its implementation. A proper record needs to be maintained to ensure implementation of all the recommendations and same should be reviewed from time to time.

5.9 SAFETY COMMITTEE MEETINGS

Following three type of safety committee meetings should be held aiming at raising the level of safety consciousness at the site:

5.9.1 Toolbox meeting

To maintain awareness, update training and convey important safety and health information, contractor supervisors should conduct tool box meetings at least weekly and also prior to start of any work. All the contractor workers should attend this meeting. The owner's supervisor/Engineer-in-charge and safety officers should also attend these meetings on random basis. Tool box meeting should be conducted more frequently depending upon circumstances. Record of the same can be maintained in the following typical format.

TOOLBOX MEETING FORM

SUBJECT :
PRESENTER :
DATE :
TIME : From….. To…..
CONTENT IN BRIEF :

Participant's Name	Signature
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5.9.2 Site Safety Committee Meeting

Primary purpose of this safety committee is to enable owner, contractor and workers to work together to monitor the site safety and health plan so as to prevent accidents and improve working condition on site. Its size and membership will depend on the size and nature of job.

The safety committee should include representatives of owner, consultant, contractor identified as safety officer/supervisor. It should be headed by Engineer-in-charge.

The safety committee should have regular and frequent meetings, atleast fortnightly, to discuss the safety and health program on site and to make suggestions for improvement. The meetings should be documented with a time bound action plan. The functions carried out by safety committee should include:

i) Review compliance of pending items of last Safety meetings.

ii) Consideration of the reports of safety personnel.

iii) Discussion of accident/near-miss and illness reports in order to make appropriate recommendation for prevention.

iv) Examination/evaluation of suggestions made by workers.

v) Dissemination of acquired knowledge through training programs and information sharing sessions.

vi) Discussion & review of Fire Prevention & Disaster Management Plan.

vii) To send recommendation to Apex Body for consideration/approvals.

5.9.3 Safety Review Meeting by Location Head

This meeting should be headed by the Location head and attended by Owner's Supervisor/Engineer-in-charge, owner's safety Officer and all concerned department heads. Prime purpose of this review is to ensure that all the recommendations of various committees are being complied with and to take decisions on critical points raised. This meeting should take place at least once in every quarter. All the investigation reports/ audit findings with status of implementation of recommendations should be discussed.

5.10 SAFETY EQUIPMENT / PERSONNEL PROTECTIVE EQUIPMENT

The type of safety equipment to be used is decided based on the job requirement. Selection should be made based on OISD-GDN-192, OISD-STD-155 (Part I & II) and the job requirement. Safety equipment / Personnel Protective Equipment (PPE) shall be of approved make. Contractor shall provide necessary training to each employee regarding proper usage and upkeep of PPE including its limitation.

A register showing stock and issue of PPE should be maintained by the contractor at site and must be available for inspection.

6.0 REFERENCES

1) OISD-GDN-206 on "Safety Management System"

2) OISD-GDN-192 on "Safety During Construction"

3) OISD-STD-155 Part(I&II) on "Personnel Protective Equipment"

4) Building & Other Construction workers (Regulation of Employment & Condition of Service) Act 1996

ANNEXURE I

LIST OF SAFETY CODES FOR CIVIL WORKS PUBLISHED BY BUREAU OF INDIAN STANDARDS

Sl.no.	Code No.	Title
1	IS: 818	Code of Practice for Safety and Health Requirements in Electric and Gas Welding and Cutting Operations – First Revision.
2	IS: 875	Code of practice for Structural safety of buildings: Masonry walls
3	IS: 933	Specification for Portable Chemical Fire Extinguisher, Foam Type – Second Revision.
4	IS: 1179	Specification for Equipment for Eye and Face Protection during Welding – First Revision
5	IS: 1904	Code of practice for Structural safety of buildings: Shallow foundations
6	IS: 1905	Code of practice for Structural safety of buildings: Masonry walls
7	IS: 1989 – Part II	Leather Safety Boots and shoes for heavy metal industry
8	IS: 2171	Specification for Portable Fire Extinguishers, Dry Powder Type – Second Revision
9	IS: 2361	Specification of Building Grips – First Revision
10	IS: 2750	Specification for Steel Scaffoldings
11	IS: 2925	Specification for Industrial Safety Helmets – First Revision
12	IS: 3016	Code of Practice for Fires Precautions in Welding and Cutting Operations – First Revision
13	IS: 3521	Industrial Safety Belts and harnesses
14	IS: 3696 – Part I	Safety Code for Scaffolds and Ladders: Part I – Scaffolds
15	IS: 3696 – Part II	Safety Code for Scaffolds and Ladders: Part II – Ladders
16	IS: 3764	Safety Code for Excavation Work
17	IS: 4014 – Part I & II	Code of Practice for Steel Tubular Scaffolding
18	IS: 4081	Safety Code for Blasting and Related Drilling Operations
19	IS: 4082	Recommendations on stacking and storage of construction materials at site
20	IS: 4130	Safety Code for Demolition of Buildings – First Revision
21	IS: 4138	Safety Code for working in compressed air – First Revision

22	IS: 4756	Safety Code for Tunneling works
23	IS: 4912	Safety requirements for Floor and Wall openings, Railings and toe boards – First Revision
24	IS: 5216 – Part I & II	Recommendations on safety procedures and practices in electrical work
25	IS: 5121	Safety code for piling and other deep foundations
26	IS: 5916	Safety Code for Construction involving use of Hot Bituminous materials
27	IS: 6994 – Part I	Specifications for safety gloves: Part I – Leather and Cotton gloves
28	IS: 5983	Specification for Eye Protectors – First Revision
29	IS: 6922	Criteria for safety and design of structures subject to underground blasts
30	IS: 7155	Code of recommended practices for conveyor safety
31	IS: 7205	Safety Code for Erection on Structural Steel Works
32	IS: 7069	Safety Code for Handling and Storage of Building Materials
33	IS: 7293	Safety Code for Working with Construction Machinery
34	IS: 7323	Guidelines for operation of Reservoirs
35	IS: 7969	Safety Code for handling and storage of building materials
36	IS: 8758	Recommendation for Fire Precautionary Measures in construction of Temporary Structures and Pandals
37	IS: 8989	Safety Code for Erection of Concrete Framed Structures
38	IS: 9706	Code of Practices for construction of Arial ropeways for transportation of material
39	IS: 9759	Guidelines for de-watering during construction
40	IS: 9944	Recommendations on safe working load for natural and manmade fibre rope slings
41	IS: 10667	Guide for selection of industrial safety equipment for protection foot and leg
42	IS: 10291	Safety Code for dress divers in civil engineering works
43	IS: 10386 – Part I	Safety Code for Construction, Operation and Maintenance for River Valley Projects
44	IS: 10386 – Part II	Safety Code for Construction, Operation and Maintenance for

		River Valley Projects
45	IS: 11057	Code of Practice for Industrial Safety Nets
46	IS: 13415	Code of Practice on safety for Protective barriers in and around building
47	IS: 13416	Recommendations for preventive measures against hazards at working places

Statutory Regulations

Latest Statutory Acts and Rules, as given below, may be referred:-

1. The Petroleum Acts 1934 and Petroleum Rules 2002
2. The Factory Act, 1948 (As amended by Factory Amendment Act 1987) and concerned Factory Rules
3. The Water (Prevention and Control of Pollution) Act 1974 & Rules 1975
4. The Environment (Protection) Act 1986
5. The Manufacturing, Storage and Import of Hazardous Rules 1989
6. The Hazardous Wastes Management (Management & Handling) Rules 1989
7. The Indian Electricity Act 1901 and Rules 1956
8. The Indian Explosive Acts, 1884 & The Indian Explosive Rules 1983
9. The Gas Cylinder Rules 1981and the static & Mobile Pressure Vessels (Unfired) Rules 1981
10. The Indian Boiler Act 1923 and Regulations 1950
11. The Public Liability Act 1991 as amended in 1992
12. The Motor Vehicle act 1988 and Central Motor Vehicle rules 1989
13. Building & Other Construction workers (Regulation of Employment & Condition of Service) Act 1996

In addition to above, various other statutory acts like EPF, ESIS, Minimum wage act and other local statutory requirements shall also be complied with.

ANNEXURE II

CHECK LIST FOR SAFETY INSPECTION / AUDIT

Job _____ Location _____ Date of Audit_____Frequency _____

Inspected by _____ Contractor (s) _____

Sl.no.	ITEM	YES	NO	NA	REMARKS / ACTION
1.0	**PERSONNEL PROTECTIVE EQUIPMENT (PPE):** Are following PPEs being used as per the job requirements?				
1.1	Safety Helmets				
1.2	Safety Shoes				
1.3	Gum Boots				
1.4	Safety Belts with life line				
1.5	Gloves				
1.6	Ear Plug				
1.7	Goggles				
1.8	Shield Glass				
1.9	Face Protection				
1.10	Breathing Apparatus				
1.11	Canister Mask				
1.12	Hand wash / Eye wash/ Respirating filter / cloth				
1.13	Boiler Suit				
1.14	Others				
2.0	**HOUSE KEEPING**				
2.1	Whether Waste Bins are provided / used				
2.2	Are Passageways / Walkways clear?				
2.3	Is General neatness O.K.?				
2.4	Is the Ground free from oil, grease etc. and is not found to be slippery?				
2.5	Others				

3.0	**EXCAVATION**				
3.1	Whether soil stability is checked?				
3.2	Whether proper shoring for the excavation is provided to prevent cave-in for side of slope >45 Degree?				
3.3	Whether proper precautions have been taken if the excavation is adjoining to heavy structure like building, street and roadways?				
3.4	While excavating whether proper slope usually 45^0 & suitable benches of 0.5 m width at each 1.5 m depth are provided?				
3.5	Whether barricading of 1m height with glowing caution board is provided for excavation beyond 1.5m depth?				
3.6	Whether excavating earth is placed beyond 1m of the edge of the trench?				
3.7	Whether heavy vehicle movement is restricted to come too close to the excavating area?				
3.8	Whether necessary precaution is taken for underground pipes, sewers, cables by contractors?				
3.9	Whether excavation hot work permit is taken?				
3.10	Whether extra precaution is taken for bailing out water properly while excavating?				
3.11	During rains whether the excavation is done with extra precaution to prevent caving in?				
3.12	Whether two separate entry/ exit points with necessary ladders / steps, as per requirement, have been provided?				
3.13	Whether one person is available at all the time to communicate any hazards noticed with workers working in deep trenches or excavation?				
3.14	Whether necessary precautions like				

	regular gas testing are being taken in areas having hydrocarbons and LPG so that no gas accumulation takes place in the trenches.				
3.15	Whether IS: 4081-1986 & Indian Explosive act & rules for storage, handling & carrying of explosive material and execution of blasting operation is followed?				
3.16	Whether in case of mechanised excavation, caution board is provided for do's and don'ts like 'Nobody to enter' within one meter of the extreme reach?				
3.17	Whether the following are inspected during excavation work :- a) Boulder formation encountered b) Collapsing / development of cracks of sides c) Marked damage to support d) Unexpected fall of ground e) Inspection of site after each blast.				
3.18	Others				
4.0	**PERMITS**				
4.1	Whether valid work permit is issued to start any work?				
4.2	Whether all conditions of the permit are fulfilled before starting the job?				
4.3	As noted in the permit, whether compliance of all the recommendations are ensured?				
4.4	Whether permits are available at work site all the times?				
4.5	Whether hot work permit registered in fire station?				
4.6	Whether permits are being closed after the completion of job?				
4.7	Others				
5.0	**SAFETY IN CUTTING / WELDING/GRINDING**				
5.1	Whether LPG / Oxygen / Acetylene/ Gas				

	cylinders are kept outside only while working in confined space?				
5.2	Are Acetylene /LPG cylinders kept in upright position and secured at designated places under shed – wet gunny bags wrapped around it if the same is under sun at designated place?				
5.3	Check cylinder and cylinder valves for any kind of damage?				
5.4	Whether protective valves are kept on cylinder while not in use?				
5.5	Whether proper means and method for transportation of cylinders to avoid dropping and rolling are being adopted / followed?				
5.6	Whether gas cylinders, regulators are kept away/free from oil and grease?				
5.7	Whether all hoses were found to be free of any damage or crack?				
5.8	Whether oxygen and acetylene cylinders are stored separately?				
5.9	Whether color coding is being used for easy identification of different type of cylinders and hoses?				
5.10	Whether cylinder keys are available near the cylinder?				
5.11	Whether gas torches with NRV with flash back arrestor of approved make are only being used?				
5.12	Whether pressure gauges are in working condition and checked from time to time?				
5.13	Whether welding shields are used while welding?				
5.14	Whether proper earthing for welding machines are provided?				
5.15	Whether power is taken from approved sources (welding receptacles)?				
5.16	Whether welding receptacles are properly grounded?				

5.17	Whether welding cables are maintained in good condition and without any joints/ cuts?				
5.18	Whether to avoid short circuit, welding machines are protected against rain?				
5.19	Whether earth connectors are securely connected to the job and not to the adjoining pipeline or structure?				
5.20	Whether flame arrestor of DG set is of approved make and quality?				
5.21	Others				
6.0	**SAND / SHOT BLASTING**				
6.1	Whether sand blasting is used only after getting approval from competent authority?				
6.2	Whether air compressor used for sand / shot blasting are positioned away from work place?				
6.3	Whether exhaust of the prime mover is directed away from the work place?				
6.4	Whether in case of motor driven compressor, the body of the motor as well as the compressor is properly earthed?				
6.5	Whether line operator of sand/shot blasting wear suitable PPEs including mask?				
6.6	Whether adequate measures are adopted to confine dust/spray particles?				
6.7	Whether adequate measures are taken for proper ventilation while the work is done in confined space?				
6.8	Others				
7.0	**SAFETY WHILE WORKING AT HEIGHTS / SCAFFOLDING / LADDERS**				
7.1	Whether work permit is obtained to take up work at height above 3 mts?				
7.2	Whether steel pipes scaffoldings are used in unit/off site areas?				

7.3	Whether provision for suitable platform with all scaffoldings are made? Whether its construction is as per specification with toe board and railing?				
7.4	Whether the area below working at height is cordoned?				
7.5	Whether suitable platform is provided?				
7.6	Whether ISI approved quality and good condition safety belts are used while working at heights?				
7.7	Whether life line of safety belt is Anchored to an independent secured support capable of withstanding load of a falling person?				
7.8	Whether the area around the scaffold is cordoned off to prohibit the entry of unauthorized person?				
7.9	Whether ropes used are of good condition and adequate strength free of defects?				
7.10	Whether ladder is placed at secured and leveled surface?				
7.11	Whether it is extended 1.5 Mts. Above the landing point?				
7.12	Whether ladder used are of adequate length and tying short ladder is avoided?				
7.13	Whether metallic ladders are placed away from electrical system?				
7.14	Whether tools or materials are removed after completion of the day's job at heights?				
7.15	Whether a valid permit is obtained before taking up work on asbestos or fragile roof?				
7.16	Whether sufficient precaution is taken while working on fragile roof?				
7.17	Whether provision is made to arrange duck ladder, crawling board for working at fragile roof?				
7.18	Whether scaffolding has been erected on rigid / firm / levelled surfaces only?				

7.19	Whether scaffold has been inspected by competent person prior to being put in use?				
7.20	Whether the scaffolding has been designed for the load to be borne?				
7.21	Whether the erection and dismantling of the scaffolding is being done only by trained persons and under supervision?				
7.22	Whether safety net with proper working arrangement and life line has been provided?				
7.23	Others				
8.0	**SAFETY IN CONFINED SPACE**				
8.1	Whether a permit is obtained to enter a confined space?				
8.2	Whether gas test for hydrocarbon, toxic gas, oxygen level is obtained before entering any confined space?				
8.3	Whether adequate oxygen level is ensured in confined space before entering? If not, whether all precaution like using of Breathing Apparatus set is ensured?				
8.4	Whether, in case of chance of ingress of hydrocarbon gases / toxic gases, Personnel Monitoring System (PMS) is used or not?				
8.5	Whether only in presence of a supervisor, worker enters in confined space?				
8.6	Whether provision of sufficient means of entry and exit is available?				
8.7	Whether provision of ventilation to remove welding fumes, dust, exhaust gases are made?				
8.8	Whether provision of 24V (Hand lamps with cage as per OISD-STD-155) light for working inside space is made?				

8.9	Is it strictly ensured that a stand-by trained person is standing outside before a person enters a confined space and communication is being maintained all the time with workers working inside?				
8.10	Whether life belt with one end under control of stand-by person outside is kept while working in confined space?				
8.11	Whether Personnel protective Equipment are in good condition as specified in the permit?				
8.12	Whether absence of Hydrogen Sulfide, CO or other toxic gas is ensured before entering into a confined space? If yes, whether proper required PPE like BA, Gas Mask are used.				
8.13	Whether boxing up is being done only as per the approved procedures and by competent persons?				
8.14	Whether all the safety precautions listed in OISD-GDN-192 are taken while working in sewers, OWS etc.?				
8.15	Whether proper house keeping is being maintained inside the confined space?				
8.16	Whether training has been provided to workers working in the confined space and the workers only of sound health are being asked to work in the confined space?				
8.17	Others				
9.0	**SAFETY IN MATERIAL HANDLING**				
9.1	Whether all lifting tools, tackles, machines, chains, ropes etc. are of sound construction, made of sound material and maintained in good condition?				
9.2	Whether safe working load, date of testing visibly marked/painted on the equipment?				
9.3	Whether lifting tools, tackles are of adequate strength for the load to be handled?				
9.4	Whether all parts including the working gears fixed or movable of every lifting machine, chain, rope, tackles specify the				

	following condition: a) Thoroughly examined by competent person at least once a year or such interval as required by statutory authority. b) Document of such examination are maintained and produced to owner supervisor before use of particular equipment?				
9.5	Whether chain blocks and cables are inspected before each use to assure their sound condition?				
9.6	Whether hoist and lift if used are: a) Properly maintained and thoroughly examined by competent authority at least once in every year. b) A register to be maintained to record particulars of such examination in prescribed forms and shall be produced to the owner supervisor before use.				
9.7	Whether area below the movement of boom of crane is cleared to avoid injury from falling objects?				
9.8	Whether it is ensured that crew of truck leave the truck in crane handling area before starting loading / unloading, if not involved in rigging operation?				
9.9	Whether transporting material from one place to another is done by suitable means?				
9.10	Whether carrier with sufficient capacity without projecting parts is used for transporting materials?				
9.11	Whether riggers engaged are well trained and conversant with signaling procedures including night signalling if required?				
9.12	Whether permission of authorized person is obtained before working on or near an overhead crane?				
9.13	Whether trained riggers are available all the time along with crane?				

9.14	Whether barricading has been done to ensure no unauthorised person enters in the working area of the crane?				
9.15	Whether lifting plan has been prepared and approved before start of the work?				
9.16	Whether route of crane movement has been planned before the crane moves out of the garage?				
9.17	Whether it has been ensured that no electrical cable come within 3 metres or safe distance from the boom of the crane?				
9.18	Whether boom is being kept in the horizontal position or locked while idling?				
9.19	Whether material is being stacked / destacked in trucks with the help of wedges to ensure no slippage while loading / unloading takes place?				
9.20	Whether the forklift / crane is being operated only by trained person?				
9.21	Others				
10.0	**ELECTRICAL SAFETY**				
10.1	Has the Electrical Line Clearance procedure been followed involving electrical and other concerned Dept. and filling of formats?				
10.2	Have Danger Signs with Voltage rating/ Men at work signboards been displayed at both Sub Station as well as the work site?				
10.3	Has the contractor worker understood the electrical circuit on which he is going to work with probable electrical hazards and mitigation measures to be adopted?				
10.4	Whether contractor has engaged electrician (s) having valid electrical licence in line with provisions in Indian Electricity Rules?				

10.5	Have all checks prior to switching operation been carried out and authorisation of owner/ user section obtained subsequently?				
10.6	Have all earthing links on electrical conductors removed before charging the line/ apparatus?				
10.7	Have PPE as prescribed under Indian Electricity Rules been in place, kept healthy and used?				
10.8	Are earthing and bonding arrangement of non-current carrying metallic parts in line with provisions of Indian Electricity Rules – 1956 amended time to time as IS: 3043?				
10.9	Have electrical part of OISD-GDN-192 and Clause No. 9.0 for Temporary installations in OISD-173 been understood and followed wherever applicable?				
10.10	Are flexible wires having voltage of 240 volts above earth potential taken through PVC conduits?				
10.11	Whether portable hand lamps with a voltage rating of not more than 24 volts used with flameproof enclosures in confined spaces within columns, vessels etc?				
10.12	Have the Switches, MCBs, fuses etc. been inspected for proper ratings?				
10.13	Has Earth Leakage Circuit Breaker (ELCB) been used on the incoming side to protect against leakage of current? Is the device tested every time the work is started?				
10.14	Whether all portable appliances are provided with insulated Three pin Plugs and socket arrangement?				
10.15	Whether industrial type extension boards and plug sockets are used?				
10.16	Has the electrical equipment brought to site by contractor been inspected by owner's supervisor/ safety officer for damage/cuts/abrasion etc? Is record of				

	Insulation Resistance, wherever required , being kept?				
10.17	Have standard practices for termination of conductors/ cables been followed (e.g. use of proper lugs, crimping tool, cable glands etc)? Is cable armour in continuity from feeding point to load?				
10.18	Are the Contractor supervisor and workmen well acquainted with first aid for electrical shock?				
10.19	Are the wires/ cables identifiable along their route towards the load by using colour coding and/or markers?				
10.20	Others				
11.0	**ROAD WORK**				
11.1	Whether site is barricaded and provided with warning signs including night warning lamps/ self glowing markers at appropriate location for diversion of traffic?				
11.2	Whether mixing aggregates with bitumen is done with the help of batch mixing plants? If no, whether adequate precautions have been taken?				
11.3	Whether road rollers, bitumen sprayers, pavement finishers are driven by experienced drivers with valid driving licenses?				
11.4	Whether the worker handling hot bitumen sprayers or spreading bitumen aggregate mix or mixing bitumen with aggregate are provided with PVC hand gloves rubber shoes with pegging upto knee joints?				
11.5	Others				
12.0	**FORM WORK, REINFORCEMENT**				
12.1	Whether form work, shuttering, shoring etc. are adequately designed and provided to erect the structure and to support the expected load?				

12.2	Whether staging (support) for shuttering is designed for loads like worker movement, impact load and other incidental loads during construction?				
12.3	Whether workers use PPEs at work site?				
12.4	Whether all safety procedures are adopted while cutting rod?				
12.5	Whether proper staging and bundling is provided for supplying rods at height?				
12.6	Whether sufficient cross bracings are provided for high staging works at vulnerable points?				
12.7	Others				
13.0	**CONCRETING**				
13.1	Whether the concreting area is barricaded?				
13.2	Whether vibrator hoses, pumping concrete accessories are in healthy condition and mechanically strong?				
13.3	Whether it is ensured that no pipe line in concrete pumping system is attached to any temporary strut such as scaffolds etc.?				
13.4	Whether it is checked that safety guards around moving parts are provided in concrete mixer/ machines?				
13.5	Whether earthing of electrical mixers, vibrator etc. are checked?				
13.6	Whether entry of unauthorised person in the concreting area is restricted?				
13.7	Whether adequate lighting arrangement is made in the concreting area if working during night?				
13.8	Whether PPEs like gum boots, gloves and dust masks etc. are being used?				
13.9	For overhead or underground work, whether form work and shuttering have been checked so that the same do not collapse during concreting?				

13.10	Others				
14.0	**DEMOLISHING (DEMOLISHING BY BLAST NOT CONSIDERED)**				
14.1	Has the stability of structure been examined by competent person and found OK?				
14.2	Are non-sparking tools being used, if required?				
14.3	Is intermittent clearing operation being done to keep the area reasonably tidy and clean?				
14.4	Whether effective barricading has been provided?				
14.5	Whether Electrical and other facilities like water, oil, gas pipelines have been isolated/protected?				
14.6	Whether the plan of demolition (including sequence of activities) has been prepared and approved prior to start of the work?				
14.7	Others				
15.0	**RADIOGRAPHY**				
15.1	Are safety precautions for handling of source as per guidelines of BARC being followed?				
15.2	Is the potency of the source being used within acceptable limits as per the BARC regulations?				
15.3	Is the area being cordoned with proper signs during radiography?				
15.4	Does proper place exist as per BARC regulations for storage of source / Personnel safety equipment?				
15.5	Does the radiographer has valid certificate of radiography from competent authority (BARC)?				
15.6	Is radiographer using Exposure Meter / Dosi Meter?				
15.7	Whether minimum occupancy of the				

	premises / workplace is being ensured while radiography is in progress?				
15.8	Is permit system being followed?				
15.9	Others				
16.0	**ADDITIONAL SAFETY PRECAUTION FOR UNITS WITH HYDROCARBONS**				
16.1	Are jobs being carried out with a valid work permit only as per OISD-STD-105 "Work Permit System".				
16.2	Is smoking prohibited in all places containing combustible or flammable materials and "No Smoking" notices prominently displayed.				
16.3	Are only approved type electrical installations and equipment, including portable lamps, being used?				
16.4	Are oily rags, waste, wooden materials and clothes or other substances liable to spontaneous ignition being removed?				
16.5	Are the combustible materials properly shielded in case same cannot be removed from the area?				
16.6	Has welding screens (like metal/asbestos/ water curtain) been put up to protect other equipment / facilities/ OWS/ drains in adjoining areas against flying sparks, as may be required?				
16.7	Is Gas-testing being done with the means of a calibrated Gas detection Meter prior to start of Hot work and being done subsequently at regular intervals as per the requirement?				
16.8	Are regular inspections being done of places where there are fire risks like in the vicinity of heating appliances, electrical installations and conductors, stores of flammable and combustible materials, welding and cutting operations?				
16.9	Are fire-extinguishing equipment being placed at strategic locations and are kept well maintained and inspected at suitable intervals by a competent person.				
16.10	Are access to fire-extinguishing equipment such as hydrants, portable				

	extinguishers and connections for hoses kept clear at all times?				
16.11	Are all supervisors and a sufficient number of workers trained in the use of fire-extinguishing equipment?				
16.12	Are audio means, to give warning in case of fire provided, audible in all parts of the site where persons are liable to work?				
16.13	Is there an effective evacuation plan in place so that all persons are evacuated speedily without panic?				
16.14	Others				
17.0	**EMERGENCY PROCEDURES**				
17.1	Is signaling / siren system effective?				
17.2	Is arrangement for rescuing affected person adequate?				
17.3	Are signs showing emergency exit route installed?				
17.4	Is emergency exit route clear of obstacles?				
17.5	Is communication system adequate?				
17.6	Whether emergency vehicle with driver has been provided to meet any emergency situation?				
17.7	Does any tie-up with hospitals or local doctors exist?				
17.8	Has the assembly point for workers in case of emergency been identified and earmarked?				
17.9	Has training been provided to a few workers for First Aid?				
17.10	Others				
18.0	**WELFARE FACILITIES**				
18.1	Is hygienic conditions prevailing at labour camps?				
18.2	Are First Aid facilities available?				

18.3	Does proper sanitation exist at site office and labour camps?				
18.4	Does any arrangement of medical facilities like tie ups with nearby hospital exist?				
18.5	Is proper drinking water facility available for workmen & staff?				
18.6	Are crèches provided for children (if applicable)?				
18.7	Is any proper place/canteen/restroom provided for eating food and taking rest?				
18.8	Is any place earmarked for storing / keeping clothing?				
18.9	Is Adequate washing facility available?				
18.10	Does proper ventilation at working place exist?				
18.11	Others				
19.0	**GENERAL**				
19.1	Are illumination levels at workplace and passages adequate?				
19.2	Is communication system adequate?				
19.3	Are display and caution boards provided at strategic locations?				
19.4	Are road barriers being used for blocking any roads/passage?				
19.5	Has the structure been adequately secured against storm/high winds during construction/ erection?				
19.6	Are the equipment properly earthed?				
19.7	Are vehicles being checked like brakes, oil, lights etc. on regular basis?				
19.8	Is compressed air being used only for its intended purpose and not for any other purpose?				
19.9	Are only proper clothes and not loose clothes being used while working around				

	machinery?				
19.10	Are nails or other sharp objects being removed or bent?				
19.11	Are machine guards over moving parts of machinery such as coupling, pulley, wheel etc. installed?				
19.12	Whether after maintenance of machinery the guards are securely fitted before putting into operation?				
19.13	Are working platforms / gangways provided with hand rails & toe guards?				
19.14	Are swing platforms provided with chains & secured adequately when not in use?				
19.15	Are the approaches to work sites being maintained & kept clear of obstacles?				
19.16	Whether engines of equipment entering into the operating area have exhaust and muffler system with approved spark arrestor?				
19.17	Whether vehicles/engine driven equipment, electrical equipment and tools used are certified?				
19.18	Whether contractors inform his workers about hazards and safe procedures?				
19.19	Whether sufficient care is taken so that spark do not go outside working enclosure & falls below?				
19.20	Whether contractor's qualified / trained supervisor is present?				
19.21	Whether all exhausts of engines are provided with approved type of flame arrestors and exhaust is not facing toward the place where the workers are working?				
19.22	Others				

Signature of the Auditor

निर्माण स्थल पर स्वास्थ्य, सुरक्षा एवं पर्यावरण प्रबंधन हेतु मानक विनिर्देश

STANDARD SPECIFICATION FOR HEALTH, SAFETY & ENVIRONMENTAL MANAGEMENT AT CONSTRUCTION SITES

Rev. No.	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	
2	18/04/2023	REVISED & UPDATED	BT	RK	JPV	SM
1	07/06/2022	REVISED & UPDATED	BT	RK	JPV	SM
0	23/12/2020	REVISED & UPDATED	BT	RK	AKK	S Mazumdar

Abbreviations:

AERB	:	Atomic Energy Regulatory Board
ANSI	:	American National Standards Institute
BARC	:	Bhabha Atomic Research Centre
BS	:	British Standard
BOCW	:	Building and other construction workers
BOO/BOOT	:	Build, Own, Operate/Build, Own, Operate, Transfer
EIL	:	Engineers India Limited
EIC	:	Engineer In charge
ELCB	:	Earth Leakage Circuit Breaker
EPC	:	Engineering, Procurement and Construction
EPCC	:	Engineering, Procurement, Construction and Commissioning
ESI	:	Employee State Insurance
GCC	:	General Conditions of Contract
GM	:	General Manager
GTAW	:	Gas Tungsten Arc Welding
HOD	:	Head of Department
HSE	:	Health, Safety & Environment
HIRAC	:	Hazard, Identification Risk Assessment & Control
HMV	:	Heavy Motor Vehicle
HV	:	High Voltage
IS	:	Indian Standard
ISO	:	International Organization for Standardization
IE	:	Indian Electricity
LTI	:	Lost Time Injuries
LMV	:	Light Motor Vehicle
LOTO	:	Lock Out & Tag Out
LPG	:	Liquefied Petroleum Gas
LSTK	:	Lump Sum Turn Key
MV	:	Medium Voltage
OH&S	:	Occupational Health and Safety
OISD	:	Oil Industry Safety Directorate
PPE	:	Personal Protective Equipment
PUC	:	Pollution Under Control
RC	:	Registration Certificate
RCCB	:	Residual Current Circuit Breaker
RCM	:	Resident Construction Manager or Site-in-Charge, as applicable
SCC	:	Special Conditions of Contract
SLI	:	Safe Load Indicator
SWL	:	Safe Working Load
TPI	:	Third Party Inspection
TBT	:	Tool Box Talks

Construction Standards Committee

Convenor: Sh John Paul V, ED(Construction)

Members:
Sh.Janak Kishore, ED (Projects)
Sh.Biswajit Mandal, CGM (SCM)
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