FORM -I: INDEMNITY BOND CUM UNDERTAKING

(In Letter Head of Company /Firm)

Job Name :
RFQ No. :

Recipient Name: **M/s Numaligarh Refinery Limited**

Assam: Address: NRP Complex, NRL site, Numaligarh, Golaghat, Assam-785699
GSTIN No. 18AAACN6984B1ZD

West Bengal: Address: Forth floor, plot no.31, Bharat Bhawan, 118 Prince Gulam Md.Shah Road, Golf Green, Kolkata, West Bengal-700095
GSTIN No.19AAACN6984B1ZB

Delhi: Address: 6th Floor, 15-17, Tolstoy house, Tolstoy Marg, New Delhi-110001
GSTIN No: 07AAACN6984B2ZF

Sub: Payment of GST Amount and filing of GST Return for availing Input Tax Credit (ITC) by Numaligarh Refinery Limited (NRL).

Sir / Madam,

With reference to payment of GST amount and filing of GST Return for availing Input Tax Credit (ITC) by NRL as per eligibility provisions for the identified Invoices raised by us, we, M/s _____, having our Registered Office at _____, possessing GST Identification No _____ hereby declare and undertake as follows:

1. We have disclosed all the facts relating to our firm to M/s Numaligarh Refinery Limited
2. We hereby agreed and undertake to file GSTR-1 on time i.e. 11th of the next month so that NRL can take Input Tax Credit by matching GSTR-2A.
3. We hereby declare that we shall deposit GST for the related invoices by 20th of the succeeding month as per the provision of GST law.
4. We hereby declare that we will file GSTR 3B related to all invoices in time i.e. 20th of the next month.
5. We hereby agree and undertake to indemnify as under:-

a. The Firm / Company shall take all necessary safeguards to ensure availing of ITC for all invoices raised on NRL without any financial loss to NRL.

b. In case of rejection of ITC by the concerned Tax Authority, for non-payment of GST amount by us or for any other reasons attributable to us, we hereby undertake and agree to indemnify NRL in full against all consequences, liabilities of any kind whatsoever directly arising from denial of ITC which includes interest and penalty arising out of such irregular availment of ITC by you opined by GST Authority.

c. We hereby agree and confirm that, any breach of the above indemnification or undertakings shall be construed as breach of the terms and conditions for reimbursement of GST and NRL shall be at liberty to take such action against us including recovering of reimbursed GST amount from
   i. Any of our Bank Guarantee executed in your favour, if any,
   ii. Security Deposit paid for any of your work, if any or
   iii. Other unpaid invoices, if any of us raised with recipient

Authorized Signature of the Indemnifier

Name:
Designation:
Seal:
Date:

SPECIAL PURCHASE CONDITIONS (SPC)

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1 DEFINITIONS

1.1 Numaligarh Refinery Limited (NRL) hereinafter called "the Owner/ Purchaser/Employer" has awarded “Licensing and Engineering, Procurement & Construction Management (EPCM) Consultancy Services for .....(name of unit) of Numaligarh Refinery Expansion Project” hereinafter called “Project” to.....(name of EPCM Conultant).

1.2 .....(name of consultant) hereinafter called "the Consultant/PMC" on behalf of NRL, invites e-bids under single stage two part system / single stage single part system (as applicable), as described in the Bidding Document.

1.3 Bidding Document/RFQ Document/Enquiry Document/Tender Document means document to be issued to Bidder(s) based on which Bid is to be submitted by Bidder(s). Throughout this Bidding Document, the term "Contract" and "Purchase Order (PO)" are synonymous.

1.4 Bidder shall mean any person, company, firm or body to whom Bidding Document is issued by NRL/ Consultant and submits the bid.

1.5 “Bid/ Offer” means the documents/proposal submitted by Bidder. Throughout this Bidding Document, the term "bid" and "tender" and their derivatives ("bidder/ tenderer", "Bid/tendered/tender", "bidding/tendering", etc.) are synonymous, and day means calendar day. Singular also means plural.

1.6 Where any portion of the General Purchase Conditions (GPC) is repugnant to or at variance with any provisions of the SPC then, unless a different intention appears, the provisions of the SPC shall be deemed to govern the provisions of the GPC and SPC provisions shall prevail to the extent of such repugnancy, or variations exist.

1.7 **Order of precedence**

The documents forming the Purchase Order are to be taken as mutually explanatory of one another. If there is an ambiguity or discrepancy in the Term & Conditions defined in the various documents, the order of Precedence shall be as follows:

- Purchase Order and its enclosures along with Purchase Requisition
- Amendment to Bidding Document, if any
- RFQ cover letter / Notice Inviting Tender (NIT) along with Bid Data Sheet
- Job Specifications
- Drawings
- Special Purchase Conditions (SPC)
- Technical specifications
- Instructions to Bidders (ITB)
- General Purchase Conditions (GPC)
- Other Documents

A variation or amendment issued after the execution of the formal contract shall take precedence over respective clauses of the formal contract and its Annexure.

2 SCOPE OF SUPPLY / WORK

2.1 The scope of supply/work shall be as given at Material Requisition (MR) / Purchase Requisition (PR) enclosed with this Enquiry Document.

3 PRICE BASIS

3.1 Clause 1 of General Purchase Conditions (Indigenous) stands replaced as under:

Prices are to be quoted on FOT / FOR Dispatch Point basis inclusive of packing & forwarding charges and third-party inspection charges (as applicable).

3.2 Clause 1 of General Purchase Conditions (Import) stands replaced as under:

Prices shall be quoted on FOB International Seaport/ FCA Airport of Dispatch Basis. The quoted prices must be inclusive of third-party inspection charges (as applicable), sea/air-worthy packing and forwarding charges, inland freight, loading, insurance and all taxes, duties, levies, bank charges, stamp duties etc. up to FOB Port/ Airport of dispatch.

3.3 Change in Point of Despatch / Port of Shipment - The seller shall not be allowed to change the point of dispatch, unless the seller absorbs any additional cost on account of change only with prior approval from NRL/EPCM Consultant.

4 FIRM PRICES

The prices shall be firm and fixed and not subject to any variation whatsoever, except Statutory variation in taxes & duties and new taxes as per **Annexure – II to SPC**. For 2 years O&M spares, prices shall be kept valid for a period of 2 years from the date of LOA.

5 TRANSPORTATION

5.1 For Indian Bidders:

Materials shall be delivered on freight prepaid and door delivery basis (up to site/warehouse/ storage yard).

5.2 For Foreign Bidders:

Ocean / Air shipment from FOB/ FCA Port of Exit to seaport of entry (Kolkata/Haldia) / CPT airport of entry (Kolkata/Guwahati) in India shall be arranged by NRL through their nominated freight forwarder. Bidder shall arrange handing over the material to NRL freight forwarder at the designated port of exit. However, bidder to quote firm Ocean/ Air freight charges in their priced bid.

NRL reserves the right to ask the bidder to arrange shipment through the bidder's own freight forwarder at the quoted freight rates. In such case, Bidder to coordinate with NRL nominated Customs House Agent for smooth discharge /delivery of the cargo at the Port of arrival. Where, the foreign bidder does not accept the ocean / Air shipment in his scope, offer of such bidder shall be rejected.

All shipments of break bulk material and containerized cargo shall be made by suitable vessels certified for sea worthiness and complying to National/ International safety regulations and age of the vessel being less than 25 years. The quoted ocean freight charges for Break Bulk cargo delivery shall be on FLT (Full Liner Terms), i.e., all charges at destination port shall be borne by the suppliers till the cargo is unloaded on to the wharf
/ vehicle as the case may be. No Trans-shipment is permitted for Break Bulk Cargo.

Bidder shall inform the Owner/EPCM Consultant atleast 07 days prior to the expected date of arrival of vessel in port of entry in India. Detention & Demurrages, if any, due to early arrival of vessel shall be to supplier's account.

The delivery basis of the goods is mentioned in BDS/RFQ. Delivery terms shall be interpreted as per INCOTERMS 2020 or its latest version in case of order on a foreign Bidder.

6 DELIVERY /COMPLETION SCHEDULE

6.1 All goods under the scope of the seller shall be shipped as per the Schedule specified in NIT/IFB/RFQ.

6.2 During execution of order, failing to meet delivery /completion schedule will be subject to Price Reduction as per **Clause 16 [titled "Delayed Delivery"]** of SPC and/or other remedies available to the Purchaser in Bidding Document.

6.3 Time of delivery as mentioned in the Purchase Order shall be the utmost important 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.

6.4 The delivery period shall be reckoned from the date of Letter of Acceptance (LOA) / Purchase Order (PO) (whichever is issued earlier).

6.5 Supplier shall submit Billing Schedule within three weeks after placement of LOA/PO (whichever is issued earlier) for EPCM Consultant/OWNER's approval (wherever applicable). Supplier may deliver the PO quantity in a single lot or in a staggered manner (Maximum 3 lots)

within the given delivery period as per RFQ. In case the Supplier delivers the PO items in more than 3 lots, than bidder may obtain a specific approval from the Project Manager of EPCM Consultant.

7 PAYMENT TERMS

7.1 Payment terms for the scope of supply/services shall be as per attached **Annexure – I to SPC**.

7.2 No initial advance payment along with order shall be made by the Owner against supplies as well as services. If a supplier insists on the same, the offer shall be rejected.

7.3 In case of advance payment against milestone, then equivalent ABG is to be submitted as per the payment terms. And the validity period of such ABGs shall be the contractual delivery period (CDD) with invocation/claim period of further 3 months. And wherever such extension of validity of ABGs shall be required due to delay in delivery or for any other reasons(s) then vendor shall provide extension for equivalent period.

7.4 Payments shall be released after adjustment of Price Reduction Schedule on account of delayed delivery, if any.

In case of Foreign Suppliers, Letter of Credit (LC) shall be opened through State Bank of India, Commercial Branch, Swagota Square, 3rd Floor, Near Rajib Bhawan, Guwahati – 781005.

7.5 An amount equivalent to the extent of eligible Input Tax Credit (ITC) available to NRL on each invoice shall be released only upon reflection of corresponding invoice and Input Tax Credit details in GSTR2B report relating to NRL in GST portal. In other words, GST component eligible for Input Tax Credit, of any invoice shall be withheld till such time same is reflected in GSTR-2B.

7.6 The bidder shall comply the requirement of E-invoicing as per notification no 13/2020-Central Tax dated 21.03.2020 and its amendments thereafter.

7.7 Govt. of India has reduced the aggregate turnover for applicability of E-invoices from earlier limit Rs. 20 crores to Rs. 10 crores, which will be effective from 1st Oct'2022. In view of the above, all vendor/suppliers are requested to raise only E-invoice to NRL with all requisite details like IRN, QR code etc. Non-complied invoices shall not be accepted for further processing after the effective date.

While Processing invoices in LIV Cell of NRL, preference shall be given for processing invoices which are digitally signed and are provided to Bill-desk/LIV-desk of NRL over e- mail in original (i.e. not scanned copy of the digitally signed invoice). Invoices with Class 1 and class 2 digital signature shall be acceptable and shall be given preference over other manually signed hardcopy of invoices for processing payments. This is to ensure faster and more efficient processing of invoices and is a step for achieving complete digitalization in NRL.

Digital Signature Certificate are legally valid in India under Information Technology Act 2000

7.8 While claiming the payment, the supplier must certify on the bill/invoice that the payment being claimed is strictly within terms of the contract/order and all the obligations on his part for claiming this payment have been fulfilled as required under the contract/ order.

7.9 All milestone payments shall be released within 30 days of receipt of Invoice, complete in all respects.

7.10 Documents for Payment for Domestic Goods as applicable:

i) Supplier's Invoice indicating, inter alia description and specification of the goods, quantity, unit price, total value;

ii) Packing list;

iii) Railway receipt/consignment note;

iv) E-Waybill

v) Manufacturer's guarantee certificate and inspection certificate;

vi) Any other document(s) as and if required in terms of the contract.

7.11 Documents for Payment for Imported Goods

i) Supplier's original invoice giving full details of the goods including quantity, value, and so on;

ii) Packing list;

iii) Certificate of country of origin of the goods to be given by the seller or a recognized chamber of commerce or another agency designated by the local Government for this purpose;

iv) Certificate of pre-dispatch inspection by the purchaser's representative;

v) Manufacturer's test certificate and guarantee;

vi) Certificate of insurance;

vii) Bill of lading/airway bill/rail receipt or any other dispatch document, indicating:

a) Name of the vessel/carrier;

b) Bill of lading/airway bill;

c) Port of loading;

d) Date of shipment;

e) Port of discharge and expected date of arrival of goods; and any other document(s) as and if required in terms of the contract.

7.12 The order value shall be exclusive of taxes/duties. 100% payment of taxes/duties shall be paid along with the payment released against dispatch documents on receipt of documentary evidence and fulfillment of conditions mentioned in Annexure-II.

7.13 All Invoices shall be raised in line with the GST Act/rules in vogue.

7.14 1stMilestone payment shall be released only after receipt of CPBG (wherever applicable) and manufacturing schedule.

7.15 Prorata payments shall be applicable on dispatch of equipment. In case of equipment, prorate shall not be on part of equipment.

7.16 In case of indigenous SUPPLIERs, wherever taxes/duties are separately indicated, the order value shall be exclusive of taxes/duties. 100% payment of taxes/duties shall be paid along with the payment released against dispatch documents on receipt of / vattable documents (wherever applicable).

7.17 Payment to indigenous SUPPLIERs shall be released through Electronic Clearing System (ECS) and to foreign SUPPLIERs shall be released through Letter of Credit (LC). Payments other than against shipping documents, i.e., for Site Work and Supervision/Training etc. shall be through wire transfer.

7.18 All bank charges of respective bankers shall be to respective account.

7.19 In case of Annual Maintenance Contract (AMC), CPBG @ 5% of maximum annual AMC amount shall be submitted within 2 weeks from the date of order and shall be valid for the entire AMC period plus 2 months claim period.

7.20 Certification for placement of sub-order and/or identification of major raw material in the payment terms shall be carried out by TPI agency, as applicable.

8 TAXES & DUTIES:

8.1 **Taxes & Duties** shall be as per attached **Annexure – II to SPC**.

8.2 The quoted price shall be deemed to be inclusive of all the taxes and duties except GST (i.e., IGST or CGST and SGST/UTGST applicable in case of interstate supply or intra state supply respectively and GST compensation cess, if applicable).

8.3 Transportation charges (as per price schedule) up to respective project site shall be exclusive of GST.

8.4 Site work charges shall be inclusive of all taxes and duties but exclusive of GST. All necessary registrations, if required, for carrying out such activities shall be done by the bidder and costs towards the same shall be included in quoted charges.

8.5 Indian Supplier having built – in Import Content considered in their bid shall also comply with the following provisions:

8.5.1 The supplier shall appoint a Customs House Clearing Agent of good standing and ensure speedy customs clearance.

8.5.2 The supplier shall be responsible to register the Import License with Customs Authorities at the Port of Import, and to answer and sort out technical queries (if any) raised by Customs Authorities in regard to any import(s).

8.6 Consignee details are as under:
Numaligarh Refinery Limited
(A Government of India Enterprise) NRL
Complex, Numaligarh,
Dist: Golaghat, Assam-785699 GST
No: 18AAACN6984B1Z

8.7 It should be ensured that the imports into India are in conformity with the export- import policy in force: FEMA; FEMA (Current Account Transactions) Rules, 2000; and directions issued by RBI under FEMA from time to time.

8.8 **Compliances for availing Export Promotion of Capital Goods (EPCG) benefit applicable for (DHDT Unit, CDU/VDU, RPTU, PFCC unit & DCU Revamp)**

EPCG (Export Promotion of Capital Goods) benefits under Foreign Trade Policy (FTP) Chapter-5 in respect of import supplies as well as domestic supplies are available for the subject supply. The import supplies include direct import by the owner or inbuild in the domestic order.

A. Domestic Procurement:

a) The suppliers shall promptly provide the owner with all relevant documents and undertakings as sought by the owner from time to time to apply for EPCG License and its Invalidation Letter. The owner shall apply for EPCG License and its Invalidation Letter with Director General of Foreign Trade (DGFT), and on receipt of EPCG License and Invalidation Letter shall forward a copy to the Supplier for dispatch of the material/supplies.

b) Following are the documents that must be provided by the supplier within one month from the date of issue of purchase order/work order/Letter of Award (whichever earlier) or at least 60 days before dispatch of material from their dispatch location whichever is earlier**:**

i. Pro-forma Invoice – To be prepared by showing Goods and Spare Parts item-wise separately with HSN code, Product Description, Units, UoM & PO reference etc. Product description in the Tax Invoice and Proforma Invoice should be as per the description with tag number given in NRL PO issued to the Supplier of goods. Also note that proforma invoice shall be in line with billing break-up wherever applicable.

ii. Copy of Import Export Code (IEC) and GSTIN of Supplier

iii. Supplier's Jurisdictional Regional Authority address (DGFT Regional Authority Address)

iv. Copy of Supplier's IEM (Industrial Entrepreneur Memorandum) / IL (Industrial License) or Udyam Registration Certificate.

v. Any other document, as may be sought by Owner (NRL) from time to time for applying for EPCG License and/or Invalidation Letter.

c) The supplier shall prepare tax Invoice immediately on dispatch of goods eligible under EPCG scheme with a declaration in the said tax invoice that "This supply is against EPCG authorization number: xxxxx and date: xx/xx/xxxx" having invalidation letter No. xxxx dated xx/xx/xxxx. The supplier's tax invoice should be in line with EPCG License/Invalidation Letter and Proforma Invoice. Any deviation with respect to product description, HSN code, Units or UoM is not acceptable to the owner as well as to DGFT/GST authority.

d) The supplier will have to declare the said supply under deemed export category in its GSTR 1 and GSTR 3B because any supply of goods manufactured in India by a registered person against an EPCG authorization/Invalidation Letter will be qualified as 'deemed export' for the purposes of GST law. [Section 2(39) read with Section 147 of CGST Act & Notification No. 48/2017-Central Tax dated 18 October 2017]. Hence, the supplier will share a copy of GSTR 1 and GSTR 3B declaring that the supply to the owner is under deemed export category.

e) The supplier will have to provide an undertaking to the effect that he has paid the GST charged in the relevant tax invoice and will not be claiming refund of said GST charged in aforesaid tax invoice. The owner will pay GST to the supplier and will claim refund of GST on the deemed export supplies against Invalidation Letter.

f) The supplier keeps in mind that in the absence of above said documents/undertakings, DGFT will not process the owner's EPCG application and therefore the owner will not get EPCG license as well as Invalidation Letter against subject supply. In case, owner is not allowed to avail the benefits so envisaged under EPCG scheme against relevant supplies due to non-receipt of documents/undertaking from the supplier's end, the same shall be passed on to the supplier and adjusted against any amounts payable to the supplier by the owner.

B. Domestic procurement having inbuilt import supply therein:

For Domestic procurement having inbuilt import supply, supplier shall be required to comply with following in addition to the requirement stated in Para A above.

Where domestic supply contains import items and inbuilt in the domestic supply order, in such cases the domestic supplier shall obtain Advance Authorisation License from its jurisdictional DGFT and import the capital goods against said advance authorisation at concessional / zero customs duty OR the domestic supplier has to claim duty draw back and pass on the benefit to owner. Any supply to the owner against EPCG License/Invalidation Letter is considered as deemed export under foreign trade policy as well as under GST Law.

9 TAX DEDUCTION AT SOURCE

9.1 Purchaser will release the payment to the Seller after effecting deductions as per applicable law in force.

9.2 Purchaser will release payments to the seller after offsetting all dues to the Purchaser payable by the seller under the Contract.

10 PROVISION W.R.T. TAX COLLECTED AT SOURCE (TCS) ON SALE OF GOODS UNDER SECTION 206C (1H) OF INCOME TAX ACT:

10.1 As per section 206C (1H) of the Income Tax Act, 1961 inserted by Finance Act 2020, a seller (as defined under the said section), who receives any amount as consideration for sale of any goods to a buyer as defined under the provision shall levy at the time of sale, TCS for a sum equal to % as defined as per the limit as specified in the Act and deposit the same with Government on receipt/collection of consideration from NRL. NRL will avail TCS credit and adjust such TCS credit against its income tax liability on the basis of TCS certificate to be issued by seller to NRL.

10.2 Bidder as a seller shall ensure compliance with all the statutory requirements regarding collection of TCS from buyer on receipt/ collection of consideration and deposit the same with Government. Bidder shall also provide timely a copy of TCS certificate to buyer.

10.3 If any tax credit, refund or other benefit is denied or delayed to NRL, wherever available to NRL, due to any non-compliance / delayed compliance by the Supplier under the said Act or due to non-furnishing or furnishing of incorrect or incomplete documents by the Supplier, the Supplier shall be liable to reimburse NRL for all such losses and other consequences including, but not limited to the tax loss, interest and penalty.

11 CANCELLATION / TERMINATION

11.1 Cancellation for Default

11.1.1 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 15 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.

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

11.1.2 If the contract is terminated in whole or in part, recourse may be taken to any one or more of the following actions:

a) Forfeiture of the EMD/CPBG/any other applicable bank guarantee.
b) Upon such terms and in such manner as it deems appropriate, goods similar to those undelivered may be procured and the supplier shall be liable for all available actions against him, as applicable in terms of the contract (including risk purchase); and
c) However, the supplier shall continue to fulfil the contract to the extent not terminated.

11.1.3 The Purchaser in that event will be entitled to procure the material from 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.

11.2 Termination of Contract for Insolvency

If the supplier becomes bankrupt or becomes otherwise insolvent or undergoes liquidation or loses substantially the technical or financial capability (based on which he was selected for award of contract), at any time, the contract may be terminated, by giving a written notice of 10 days to the supplier, without compensation to the supplier, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to Owner / Consultant.

11.3 Termination of Contract for Convenience

11.3.1 The PURCHASER may at any time, by written notice of 10 days sent to the SELLER, Cancel the CONTRACT, in whole or part, for its 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.

11.3.2 The GOODS that are complete and ready for shipment within 30 days after the SELLER'sreceipt 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.

11.4 **Methodology for processing Cancellation / Termination**

The methodology for processing Cancellation/Termination for default shall be as follows:

11.4.1 Any material breach in contractual obligations shall be dealt on mutual discussion basis, so as to correct breach. In case of failure to correct the breach, Consultant/Owner shall initiate Termination action as per the Purchase Order.

11.4.2 In case of non-submission of CPBG within the period stipulated, required CPBG amount alongwith interest for the delayed period shall be recovered from the first RA bill / first Milestone payment, onwards, on proportionate basis, till full recovery.

However, in case, if the Supplier submits CPBG before the first RA bill/ first Milestone payment, then interest shall be recovered from the first RA bill/ first Milestone payment, for the delayed period beyond the period stipulated for CPBG.

For the purpose of above mentioned, interest rate shall be @ SBI MCLR + 1% as on date of issuance of enquiry.

11.4.3 In case of non-submission of CPBG within one month beyond the period stipulated for it, coupled with non-mobilization / non-performance within the period stipulated for the same, the Termination action along with other contractual penal provisions may be initiated, as per the Purchase Order provisions.

11.4.4 Further, in case of submission of CBPG within scheduled period, but Supplier being at default in terms of Purchase Order, Clause 11.1 above shall be applicable.

11.4.5 In case of occurrence of any of the above specified events, Supplier shall be understood to have defaulted and the Owner shall have the right to terminate the Purchase Order, at its sole and absolute discretion by issuing a Show Cause notice of 15 calendar days to the Supplier, stating the reason and the intention of Owner to terminate the Purchase Order and to take other penal actions in terms of the Purchase Order including extant policy for Suspension/ Banning of Consultant/Owner.

11.4.6 Consultant/Owner based on the Supplier's response to the Show Cause Notice and the personal hearing, shall decide the action regarding Termination and/ or Suspension / Banning or otherwise.

11.4.7 The decision taken as above shall apply to both Termination as well as Suspension / Banning.

In case contract/ Purchase order awarded for the tendered work have to be terminated due to supplier's default and a separate enquiry / tender have to be floated to get the remaining/ complete work executed, such defaulting supplier will not be considered for enquiries/ tenders issued for the refloated works of same project.

12 GUARANTEE /WARRANTY PERIOD

12.1 Guarantee /Warranty Period shall be applicable as per clause no. 10 of General Purchase Condition (Indigenous) & General Purchase Condition (Import).

12.2 Wherever site work is included in the scope specified in the MR/PR and Guarantee/Warrantee period is expired due to delay in handing over of front or any other reason, defect liability period of 12 months shall be applicable from the date of handing over of duly erected/commissioned (as applicable) equipment/package.

13 INSURANCE

13.1 NRL shall take comprehensive marine-cum-erection all risk policy (MCEAR) for the project. Supplier is responsible till the material is handed over to NRL or NRL's appointed contractor, including transit and storage risk at the supplier's warehouse. Where custody of the material is transferred to NRL or NRL appointed contractor, transit insurance and storage shall be in NRL or NRL appointed contractor's scope. However, supplier shall intimate dispatch details and value of goods in advance to NRL for transit insurance coverage.

13.2 Extract of NRL Insurance Clause/ Policy is attached as Annexure-IX to SPC.

14 TESTING AND INSPECTION:

In partial modification to applicable provisions of GPC:

14.1 Goods and Services shall be subject to stage wise and final inspection by Third Party

Inspection (TPI) agency. The TPI charges shall be included in quoted prices, and no additional charges shall be paid by Owner.

14.2 Similarly, all built in import content (if applicable) shall also be subject to inspection by TPI agencies, in the country of origin of the import content, and charges for the same are included in quoted prices, and no additional charges shall be paid by Owner.

14.3 Inspection of Goods at manufacturer's works within India and raw materials/components sourced within India shall be carried out by NRL approved Third Party Inspection Agency. However, wherever Inspection by EPCM Consultant is specified as per approved Inspection Test Plan (ITP) enclosed with Material Requisition (MR)/ Purchase Requisition (PR), the same shall be carried out by EPCM Consultant without any additional cost to supplier.

14.4 All Foreign sourced materials shall be inspected by approved Third Party Inspection Agencies. Inspection charges for the same shall be borne by the bidders and shall be included in their quoted price.

14.5 Inspection of all bought out items shall be subject to pre- dispatch inspection from any of the approved TPI Agencies and shall be arranged by the bidder at his own cost.

14.6 Name of NRL approved TPI Agencies are as under:

- M/s SGS India Pvt Ltd
- M/s TUV SUD South Asia Pvt Ltd
- M/s Bureau Veritas India Pvt Ltd
- M/s TUV India Pvt Ltd
- M/s Certification Engineers International Ltd
- M/s Irclass Systems And Solutions Pvt Ltd.
- M/s Lloyd's Register Marine and Inspection Services India Ltd.
- M/S TUV Rheinland (India) Pvt Ltd.
- M/S VCS Quality Services Pvt Ltd.

14.7 It will be bidder's responsibility to arrange for third party inspection (if applicable) and submit third party inspection release note on time. No time extension shall be allowed by NRL for any delay/lapse in this regard**.**

14.8 Any materials/ goods covered under scope of supply, which during the process of inspection by Purchaser/ appointed third party, at any stage prior to dispatch, is found not conforming to the requirements/ specifications of the Purchase Requisition/ Order and shall be liable for immediate rejection.

14.9 Seller shall be responsible and liable for immediate replacement of such material with acceptable material at no extra cost or impact on the delivery schedule to Purchaser.

15 CONTRACT PERFORMANCE BANK GUARANTEE (CPBG)/ SECURITY DEPOSIT

Clause no. 29 of General Purchase Condition (Indigenous) & Clause no. 4 of General Purchase Condition (Import) stands modify to the following extent:

15.1 CPBG of 10% of the Total Order Value (Supply Plus Site Work, wherever applicable) shall be submitted by the Seller (including MSEs, Public Sector Undertakings and other Government bodies) within 30 days from the date of award, for order values above INR 10 lakhs.

This bank guarantee shall be valid (shall remain in force) for guarantee period (as mentioned in the GPC), with an invocation period of 3 months thereafter.

15.2 Total Order value shall mean supply price including packing and forwarding charges/ TPI charges (FOT dispatch point price for Indian bidder and FOB/ FCA price for foreign bidders) plus site work (wherever applicable) but excluding GST, transportation, Training services, PWAMC and supervision services.

15.3 Bank Guarantee towards CPBG shall be from any Indian scheduled bank (except Cooperative & Gramin Banks) or a branch of an International bank situated in India and registered with Reserve Bank of India as scheduled foreign bank in case of Indian bidder. However, in case of bank guarantees from banks other than the Nationalized Indian banks, the bank must be a commercial bank having net worth in excess of Rs. 100 crores or its equivalent in U.S. Dollars) and a declaration to this effect should be made by such commercial bank either in the Bank

Guarantee itself or separately on its letterhead.

15.4 Foreign Suppliers can submit Irrevocable Standby Letter of credit (SBLC) in place of Contract cum Performance Bank Guarantee (CPBG) from any Indian scheduled bank (except Cooperative & Gramin Banks) or from any Indian branch of an International bank registered with Reserve Bank of India as scheduled foreign bank.

15.5 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 Owner either in full or in part in terms of Seller's Performance shall be replenished by the Seller within two weeks thereof.

15.6 Failure of the successful Bidder to comply with the requirements of this article shall constitute sufficient grounds for the annulment of the award and forfeiture of the Earnest Money Deposit (EMD), if any.

15.7 Wherever supervision is included in the scope specified in the MR/PR, bidders shall provide additional BG for an amount equal to the per diem charges for the number of days considered for evaluation over and above 10% CPBG, to cover compensation for delay in mobilizing the erection/commissioning personnel. This BG will be released to the bidder upon the erection/ commissioning personnel reporting at site. This BG shall be furnished along with last milestone payment of Supply and shall be valid up to six months which shall be extended based on the request by NRL.

15.8 Wherever site work is included in the scope specified in the MR/PR and Guarantee/Warrantee period is expired due to delay in handing over of front or any other reason, bidders shall provide additional BG for an amount equal to the last milestone payment of site work. This BG shall be valid for defect liability period of 12 months from the date of handing over of duly erected/commissioned (as applicable) equipment/package plus claim period.

15.9 In case of package contract where scope of the purchase order also involves Post Warrantee Comprehensive Annual Maintenance Contract (PWCAMC), Within 2 weeks of placement of Order for AMC, Seller shall submit CPBG for 5% of the Maximum annual AMC amount which shall be valid for the entire AMC period plus 2 months claim period.

15.10 BG shall be as per the prescribed formats. The BG contains the name, designation and code number of the Bank officer(s) signing the guarantee(s). The address and other details (including telephone no.) of the controlling officer of the bank are obtained from the branch of the bank issuing the BG (this should be included in all BGs. Bank guarantee should be routed through SFMS platform. Relevant information are as follows:

15.10.1 **Beneficiary bank details:**

Axis Bank Chhibber House, Ground Floor, G.S Road, Guwahati -781005 IFSC:

UTIB0000140

15.10.2 Advising message to be sent to beneficiary bank:

IFN 760 / IFN 760 COV for issuance of bank guarantee IFN 767

/ IFN 767 COV for amendment of bank guarantee

Field number as "7037" and Particulars (to be mentioned in Row 1) as "NRL140025551" should be correctly captured in the above messages.

The supplier shall submit to NRL the copy of SFMS message as sent by the issuing bank along with the original bank guarantee. Issuing bank mail ID should be invariably mentioned on the face of the bank guarantee.

16 DELAYED DELIVERY

Provisions of Clause 15 of GPC (Indigenous) and Clause 5 of GPC (imports) stands modified to the following extent:

16.1 The delivery period quoted/ agreed shall be strictly followed. Failing supplies in time, NRL reserves the right to cancel the order and take alternative procurement action solely at the risk and cost of the vendor.

16.2 In case of delay in execution of the order, NRL may at its option, recover from the vendor price

reduction of 0.5% of the value of delayed goods per week of delay or part thereof subject to a maximum of 5% of the total order value of goods.

16.3 However, wherever MR/PR contains packages/ equipment/Site work, delay for delivery shall be applicable for total order value (i.e., half percent (1/2%) of the Total Order Value (TOV) for every week of delay or part thereof, limited to a maximum of Five percent (5%) of the Total Order Value (TOV).

16.4 Wherever the supply period and site work are indicated as two separate periods and notice of site readiness is required to be provided for site work, intervening period, if any, shall be excluded, while calculating the price reduction for delay.

16.5 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.

16.6 Total Order value shall mean supply price including packing and forwarding charges/ TPI charges (FOT dispatch point price for Indian bidder and FOB/ FCA price for foreign bidders) plus site work (wherever applicable) but excluding GST, transportation, Training services, PWAMC and supervision services.

16.7 Where erection/commissioning supervision, commissioning assistance is required from the vendor, penalty for non-mobilization/delay in mobilization as per order shall be 1.5 times the per diem rate for each day of delay of reporting to site and shall be in addition to price reduction for delayed delivery.

17 FORCE MAJEURE:

Clause no. 31 of General Purchase Condition (Indigenous) & Clause no. 6 of General Purchase Condition (Import) last paragraph is modify to the following extent:

An FM clause in the contract frees both parties from contractual liability or obligation when prevented by such events from fulfilling their obligations under the contract. An FM clause does not excuse a party's non-performance entirely, but only suspends it for the duration of the FM. The firm has to give notice of FM as soon as possible and it cannot be claimed ex-post facto.

There may be a FM situation affecting the purchase organisation only. In such a situation, the purchase organisation is to communicate with the supplier along similar lines as above for further necessary action. If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of FM for a period exceeding 90 (ninety) days, either party may at its option terminate the contract without any financial repercussion on either side. Any delays in or failure of the performance of either party hereto shall not constitute default hereunder or give rise to any claims for damages, if any, to the extent such delays or failure of performance is caused by force majeure.

Force Majeure Events Exceeding 90 Days: If an event or series of events (alone or in combination) of Force Majeure occur and continue for a period in excess of 90 consecutive days then NRL shall have the right to terminate this agreement, whereupon the Parties shall meet to mitigate the Impediments caused by the Force Majeure event.

18 TRANSFER OF PROPERTY FROM THE SELLER TO THE PURCHASER

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

a) FOT/FOR Dispatch point: On handing over the equipment to the carrier against receipt and such receipt having been passed over to the Purchaser.

b) FOT/FOR/DAP 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.

The delivery basis shall be as per RFQ Covering Letter/BDS.

19 GOVERNING LAW

19.1 Laws of India will govern the Contract / Purchase Order and jurisdictions of the courts in the city of Golaghat or Guwahati will have exclusive jurisdiction on all matters related to Contract / Purchase Order.

20 FRAUDULENT PRACTICES

20.1 NRL requires that Bidders/ Vendors/ Suppliers observe the highest standard of ethics during the award/ execution of Purchase Order. "Fraudulent Practice" means a misrepresentation of facts in order to influence the award of a Contract to the detriment of the NRL, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non- competitive levels and to deprive the NRL of the benefits of free and open competition.

20.2 NRL will reject a proposal for award if it determines that the bidder recommended for award has engaged in fraudulent practices in competing for the Contract in question.

20.3 Bidder is required to furnish the complete and correct information/ documents required for evaluation of their bids. If the information/ documents forming basis of evaluation is found to be false/ forged, the same shall be considered adequate ground for rejection of bids and forfeiture of EMD/Bid Security, if any.

20.4 In case, the information/ document furnished by the Bidder/ Vendor/ Supplier forming basis of evaluation of his bid is found to be false/ forged after the award of the contract, NRL shall have full right to terminate the contract and get the remaining job executed at the risk & cost of such Bidder/ Vendor/ Supplier without any prejudice to other rights available to NRL under the contract such as forfeiture of CPBG/ Security Deposit, withholding of payment etc.

20.5 In case, this issue of submission of false documents comes to the notice after execution of supply/work, NRL shall have full right to forfeit any amount due to the Bidder/ Vendor/Supplier along with forfeiture of CPBG furnished by the Bidder/Vendor/ Supplier.

20.6 Further, such bidder/ vendor/ Supplier shall be put on Suspension / Banning List /Blacklist/ Holiday/ NegativeList of NRL/EPCM Consultant debarring them from future business with NRL for a time period, as per the prevailing policy in NRL.

21 INDEPENDENT SELLER

21.1 It is expressly understood and agreed that Seller is an independent party and that neither the Seller/ its personnel are servants, agents or employees of Purchaser/ Consultant nor the Seller has any kind of interest in other sellers.

22 LIEN

22.1 Seller shall ensure that the Scope of Supply under the Contract shall be free from any claims of title/liens from any third party. In the event of such claims by any party, Seller shall at his own cost defend, indemnify and hold harmless Purchaser or its authorized representative from such disputes of title /liens, costs, consequences etc.

23 PART ORDER

Part Order shall be as per the provision of General Purchase Conditions. Further, Bidder hereby agrees that items may be split (wherever applicable) to meet the Public Procurement Policy, 2012 for MSEs (Micro & Small Enterprise) or Public Procurement (Preference to Make in India) (PPP-MII), issued by Govt. of India.

24 GOVERNMENT OF INDIA NOT LIABLE

It is expressly understood and agreed by and between the SUPPLIER and the NRL that the NRL is entering into this Contract solely on its own behalf and not on behalf of any other person or entity. In particular, it is expressly understood and agreed that the Government of India is not a party to this agreement and has no liabilities, obligations or rights there under. It is expressly understood and agreed that the NRL is an independent legal entity with power and authority to enter into contract, solely in its own behalf under the applicable laws of India and general principal of Contract Law. The Seller expressly agrees, acknowledges and understands that the NRL is not an agent, representative or delegate of Govt. of India. It is further understood and agreed that the Govt. of India is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the contract. Accordingly, Seller hereby expressly waives, releases and foregoes any and all actions or claims, including cross claims, impleader claims or counter claims against the Govt. of India arising out of this contract and covenants not to sue to Govt. of India as to any manner, claim, cause of action or thing whatsoever arising of or under this Contract.

25 LIMITATION OF LIABILITY:

Clause No. 34 of GPC (Indigenous) and Clause No. 30 of GPC (Imports) stands replaced as under:

25.1 The aggregate liability of the supplier to NRL under the Contract shall be the total Contract Price, except that this Clause shall not limit the liability of the Supplier for following:

i. Any liability pursuant to supplier's breach of any Applicable Law;
ii. any loss resulting from fraud, intentional or willful misconduct or illegal or unlawful acts, or gross negligence or omissions of the supplier or its affiliates or any sub-vendor or any supplier or any of its or their respective officers, directors, employees, servants or agents or any other person acting on behalf of the Supplier; or
iii. any liability to rectify, repair, restore or replace any materials and/or works or deficiencies therein in terms of the Contract; or
iv. In the event of any claim or loss or damage arising out of infringement of Intellectual Property; or
v. For any damage to any third party, including death or injury of any third party caused by the supplier or any person or firm acting on behalf of the supplier in executing the order; or
vi. Any liability pursuant to supplier's indemnity obligations under the Contract; or
vii. Supplier's liability for Price adjustment for utility consumption beyond the Guaranteed Values as per Tender Documents

AND provided always that such limitation shall exclude any amounts recovered under any policy(ies) of insurance taken out and/or maintained by the SUPPLIER pursuant to the provisions of the Contract.

25.2 Neither Party shall be liable to the other Party for any kind of indirect or consequential loss or damage including, loss of use, loss of profit, loss of production or business interruption which is connected with any claim arising under the Contract.

26 SINGLE POINT RESPONSIBILITY OF THE SUPPLIER:

26.1 In case of indigenous POs containing supplies as well site work/ services, a single order, covering the supply part as well site work/ services, shall be placed.

26.2 In case, a foreign SUPPLIER order involving part supply/site work/site services in INR, separate orders may be issued with suitable interlinking clause. For this purpose, the Indian sub-SUPPLIER's name, material/ services and corresponding price in Indian Rupees, shall be clearly spelt out in the offer of foreign SUPPLIER. The detailed terms & conditions for Indian Sourced Components/Services by Foreign bidder shall be applicable as per attached **Annexure-IV to this SPC.**

27 REQUIREMENT OF EMPLOYMENT VISA FOR FOREIGN NATIONALS COMING TO INDIA

FOR EXECUTION OF PROJECTS:

27.1 All Foreign nationals coming to India for execution of Projects / Contracts will have to apply for Employment Visa only and that grant of Employment visa would be subject to strict adherence of following norms:

27.1.1 Employment visa is granted only for the skilled and qualified professionals or to a person who is being engaged or appointed by a Company, Organization, Industry or Undertaking etc. in India on contract or employment basis at a senior level, skilled position such as technical expert, senior executive or in managerial position etc.

27.1.2 Request for employment visa for Jobs for which large number of qualified Indians are available, is not considered.

27.1.3 Under no circumstances an Employment visa is granted for routine, ordinary secretarial / clerical jobs.

27.2 Bidders are advised in their own interest to check latest Visa rules from Indian Embassy/ High Commission in their country in case foreign nationals are required to be deputed to India during execution of contract.

28 POLICY FOR PROVIDING PREFERENCE TO DOMESTICALLY (INDIAN) MANUFACTURED IRON & STEEL PRODUCTS IN GOVERNMENT PROCUREMENT (DMI &SP) (as applicable):

SUPPLIER shall mandatorily comply with the provisions under DMI & SP policy as enclosed with the ITB.

29 PUBLIC PROCUREMENT (PREFERNCE TO MAKE IN INDIA) (as applicable):

29.1 For detailed guidelines, refer **Appendix – III to Instructions to Bidders (ITB).** Refer Bid Data Sheet for applicable category of enquiries:

a) Enquiry exclusive to Class-I Suppliers: In case RFQ has been specifically issued to / applicable for Class-I Local Suppliers, only Class-I Local Suppliers, as defined in PPP- MII Policy shall be eligible to bid.
b) Enquiry to local Suppliers: If any RFQ is issued on domestic tender (bidding) basis except Category a) above, only Class-I local supplier and Class-II local supplier shall be eligible to bid.
c) Global Enquiries: In case the RFQ is issued on global bidding basis, Non-local suppliers shall also be eligible to bid along with Class-I local suppliers and Class-II local suppliers.

30 TERMS & CONDITIONS FOR POST WARRANTY COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT (PWCAMC) (as applicable):

30.1 If Post Warranty Comprehensive Annual Maintenance Contract) is applicable as per Technical Section of Bidding Document, the Terms & Conditions shall be as per **Annexure – III to this SPC**.

31 TERMS & CONDITIONS FOR SUPERVISION OF ERECTION, TESTING & COMMISSIONING / TRAINING AT SITE (as applicable):

31.1 Terms & conditions for supervision of erection, testing & commissioning / training at site shall be as per attached **Annexure-V to SPC.**

32 TERMS & CONDITIONS FOR INSTALLATION/ SITE WORK (as applicable):

32.1 Terms & conditions for installation/ site work shall be as per attached **Annexure-VI to SPC.**

33 TERMS & CONDITIONS FOR SITE FABRICATION (as applicable):

33.1 Terms & conditions for site fabrication shall be as per NRL GCC.

34 TERMS & CONDITIONS FOR TRAINING OF OWNER PERSONNEL AS PER MR/PR AT VENDOR'S WORKS/ TRAINING FACILITY (as applicable):

34.1 Terms & conditions for training of owner personnel as per MR/PR at vendor's works/ training facility shall be as per attached **Annexure-VII to SPC.**

35 PACKING, MARKING, SHIPPING AND DOCUMENTATION- INDIGENOUS AND IMPORTED MATERIALS (as applicable)

35.1 Specifications for Packing, Marking, Shipping and Documentation applicable for Indigenous & Imported Materials are attached as **Annexure-VIII to SPC**.

36 Bidder's right to question rejection:

A tenderer shall have the right to be heard in case he feels that a proper procurement process is not being followed and/or his tender has been rejected wrongly. The tenderer is to be permitted to send his representation in writing. Only a directly affected bidder can represent in this regard:

i. Only a bidder who has participated in the concerned procurement process i.e. prequalification, bidder registration or bidding, as the case may be, can make such representation
ii. In case pre-qualification bid has been evaluated before the bidding of Technical/ financial bids, an application for review in relation to the technical/ financial bid may be filed only by a bidder who has qualified in pre-qualification bid;
iii. In case techno-commercial bid has been evaluated before the opening of the financial bid, an application for review in relation to the financial bid may be filed only by a bidder whose technical bid is found to be acceptable
iv. Following decisions of the procuring entity in accordance with the provision of internal guidelines shall not be subject to review:
   a) Determination of the need for procurement;
   b) Selection of the mode of procurement or bidding system;
   c) Choice of selection procedure;
   d) Provisions limiting participation of bidders in the procurement process;
   e) The decision to enter into negotiations with the L1 bidder;
   f) Cancellation of the procurement process except where it is intended to subsequently re-tender the same requirements;
   g) Issues related to ambiguity in contract terms may not be taken up after a contract has been signed, all such issues should be highlighted before consummation of the contract by the vendor; and
   h) Complaints against specifications except under the premise that they are either vague or too specific so as to limit competition.

37 REPEAT ORDER :

Repeat orders on same unit prices, terms & conditions will be applicable within a period of 12 months from the date of LOA/Purchase Order and its value shall be limited to 100% of the total order value and item wise repeat order quantity shall be limited to 100% of the original item quantity.

ANNEXURE-X

SELF DECLARATION OF CONFLICT OF INTEREST

Job Name:

Tender No.:

Terms & Conditions in respect of "Conflict of Interest" in the bidding process:-

A bidder shall not have conflict of interest with other bidders. The bidders found to have a conflict of interest shall be disqualified.

A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

a) they have controlling partner(s) in common; or

b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or

c) they have the same legal representative/agent for purposes of this bid; or

d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or

e) bidder participates in more than one bid in this tender. Participation by a bidder in more than one bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid.

f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following:
   1. The principal manufacturer directly or through one Indian agent on his behalf; and [in case of receipt of bids from both the Indian agent & the principal, the principal manufacturer shall be approached to arrange for withdrawal of one of the bids; in case of non-withdrawal, the bid from the principal manufacturer shall be considered]
   2. Indian/foreign agent on behalf of only one principal.

g) a bidder or any of its affiliates provided the consultancy (through another contract) in the preparation of the design or technical specifications of this supply/contract;

h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business.

SELF DECLARATION OF CONFLICT-OF-INTEREST FREE BID

I am / We are participating in this tender (*whole or part of the tender against which separate contracts will be awarded to individual bidders*), taking note of the above terms & conditions and hereby declare that there is no other participating bidder in the same (*whole or part of*

the tender), which may create conflict of interest as described above, to the best of our knowledge and understanding.

I/We understand that in case any conflict of interest is found to have occurred, NRL will disqualify the bids from the bidders deemed to have conflict of interest.

I / We further declare that in case I / We observe that any conflict of interest is found to have occurred after the unpriced bid opening, I / We shall immediately inform NRL in writing regarding such conflict of interest **within 2 days** from unpriced bid opening; and NRL shall have the right to disqualify the bids from the bidders deemed to have conflict of interest.

It is understood that any wrong declaration / non-declaration in this context shall make me / my agency / company liable for further action under Holiday Listing procedure of NRL.

_____

Date: (SIGNATURE OF BIDDER)
Place:

ANNEXURE-XI

Job Name :

Tender No. :

SELF DECLARATION OF DEBARMENT / BLACKLISTING / HOLIDAY LISTING & ALLIED FIRMS

(1) **SELF DECLARATION OF DEBARMENT / BLACKLISTING / HOLIDAY LISTING**

I/We hereby declare that I am / we are currently not serving any holiday listing/black listing/debarment orders issued by Numaligarh Refinery Limited (NRL) or Ministry of Petroleum & Natural Gas (MoPNG) debarring me/us from participation in tendering or carrying on business dealings with NRL/MOPNG.

I/We understand that bids from the bidders who are on holiday list by NRL or MoPNG will not be considered.

It is understood that any wrong declaration in this context shall make me / my agency / company liable for action under Holiday Listing procedure of NRL.

2) **DECLARATION OF ALLIED FIRMS OF THE BIDDER**

I/We hereby declare that following are my/our allied firm(s) (*as defined in NRL's holiday listing policy*):-

Name(s), PAN and GST number(s) of our allied firms are as follows: -

Sl. No.	Name of Allied Firm	PAN	GSTN

It is understood that in case of debarment of me / my agency / company by NRL, the debarment shall be automatically extended to my/our allied firms.

Date: **(SIGNATURE OF BIDDER)**

Place:

Note: *Please refer NRL's current "Policy for Holiday listing/ Banning/ Debarring of Contractors/ Suppliers" available in NRL website www.nrl.co.in (under "Tenders" section) for details. Bidders are requested to carefully read the said policy which will be applicable for this tender.*

ANNEXURE – I to SPC

	INDICATIVE PAYMENT TERMS
A.	**<u>FOR INDIGENOUS SUPPLIERS</u>:**
1.	**Supply:**
1.1.	• 90% against receipt and acceptance of items at site. • 10% after completion of all supply and alongwith tax deposit and returned filed as perGST rules. Bidders payment are subject to TDS, TCS as per applicable Act of Govt.

	NOTES : (i) 1ST Milestone payment shall be released only after receipt of CPBG (wherever applicable) and manufacturing schedule (in template available on eDMS portal). (ii) In case of indigenous SUPPLIERs, wherever taxes/duties are separately indicated, the order value shall be exclusive of taxes/duties. 100% payment of taxes/duties shall be paid along with the payment released against dispatch documents on receipt of / vattable documents (wherever applicable). (iii) Payment to indigenous SUPPLIERs shall be released through Electronic Clearing System (ECS) . (iv) All payments shall be released within 30 days of receipt of invoice and all requisite documents, complete in all respects. (v) All bank charges of respective bankers shall be to respective account. (vi) Supplier shall submit Billing Schedule within three weeks after placement of LOA/PO (whichever is issued earlier) for Consultant /OWNER's approval (wherever applicable). (vii) Suppliers requiring multiple despatches will restrict the number of despatches to maximum three, unless agreed otherwise by Project Manager. (viii) Certification for placement of sub-order and/or identification of major raw material, in the above payment terms, shall be carried out by Consultant/TPI agency, as applicable.

*****

Annexure-II

Taxes & Duties

A. **PRICE BASIS W.R.T INCLUSION/EXCLUSION OF TAXES:**

1. The quoted price shall be deemed to be inclusive of all the taxes and duties except GST (i.e. IGST or CGST and SGST/UTGST applicable in case of interstate supply or intra state supply respectively and GST compensation cess, if applicable).

2. In case of foreign bidders, bidders shall submit their prices on FOB international seaport of exit basis (INCOTERM 2020), unless otherwise stated in the bid document. FOB prices quoted shall be inclusive of all applicable taxes upto FOB international port of exit.

3. Transportation charges (as per price schedule) upto respective project site shall be exclusive of GST.

4. Site work prices, if applicable shall be inclusive of all taxes and duties but exclusive of GST. All necessary registrations, if required, for carrying out the site activities shall be done by the bidder and costs towards the same shall be included in quoted site work prices.

5. Prices of per diem supervision charges, training/AMC, if applicable shall be exclusive of GST. However, GST shall not be applicable on training provided at foreign bidder's work/training facilities in their country.

B. **TAX CLAUSES:**

1. Goods and services tax

a. Contractor/vendor shall be required to issue tax invoice in accordance with GST Act and/or Rules so that input credit can be availed by Owner. In the event that the contractor/vendor fails to provide the invoice in the form and manner prescribed under the GST Act read with GST invoicing rules there under, Owner shall not be liable to make any payment on account of GST against such invoice.

b. GST shall be paid against receipt of tax invoice and proof of payment of GST to Government (or auto-population of input tax credit on GSTIN portal). In case of non-receipt of tax invoice and/or non-payment of GST by the contractor/vendor (or non-auto-population of input tax credit on GSTIN portal), owner shall withhold the payment of GST.

c. GST payable under reverse charge for specified services/goods under GST Act or Rules, if any shall not be paid to the contractor/vendor but will be directly deposited to the Government by owner.

d. Where Owner has the obligation to discharge GST liability under reverse charge mechanism and Owner has paid or is liable to pay GST to the Government on which interest/penalty becomes payable as per GST law for any reason which is not attributable to Owner or Input Tax Credit w.r.t. such payment is not available to Owner for any reason which is not attributable to owner, then owner shall be entitled to deduct/set off /recover such amount against any amounts paid/payable by owner to contractor/supplier.

e. The contractor/vendor shall always comply with the requirements of applicable laws and provide necessary documents as prescribed under the rules and regulations, as applicable from time to time. In particular, if any tax credit, refund or any other benefit is denied/delayed to Owner due to any non-compliance/ delayed compliance by the vendor/ contractor under the GST Act (including but not limited to failure to upload the details of the sale on GSTN portal, failure to pay GST to the government or due to non-furnishing or furnishing of incorrect or incomplete documents, non-filing of GST return by the supplier), the contractor/vendor shall be liable to reimburse Owner for all such losses and other

consequences including but not limited to the tax loss, interest and penalty. Owner shall be entitled to recover such amount from the contractor/vendor by way of adjustment from the next invoice, encashment of PBG or by way of any other means.

f. TDS under GST, if applicable shall be deducted from contractors/vendors bills at applicable rates and a certificate as per rules for tax so deducted shall be provided to contractor/vendor.

g. The vendor/contractor will be under obligation for charging correct rate of tax as prescribed under the respective tax laws. Further the vendor/contractor shall avail and pass on benefits of all exemptions/concessions available under tax laws.

h. The vendor/contractor will be liable to ensure to have registered with the respective tax authorities and to submit self-attested copy of such registration certificates and the vendor/contractor will be responsible for procurement of material in its own registration (GSTIN).

i. In case bidder is covered under composition scheme under GST law, then bidder shall quote the price inclusive of GST. Further, such bidder should mention "cover under composition system" in column for GST of price schedule. In case subsequently such vendor/contractor gets covered under regular GST regime or any other scheme, the price including GST shall not exceed the price quoted by bidder under composition scheme.

j. Owner will prefer to deal with registered supplier of goods/services under GST. Therefore, bidders are requested to get themselves registered under GST, if not registered yet. However, in case any unregistered bidder is submitting their bid, their prices will be loaded with applicable GST while evaluation of bid. Where Owner is entitled for input credit of GST, the same will be considered for evaluation of bid as per evaluation methodology of tender document.

k. Bidders will be required to quote applicable tax rate (along with applicable SAC/ HSN Code) as per provisions of GST law for all the line items forming part of the enquiry. Any higher rate of tax actually invoiced in excess of quoted rate of tax (except in compliance with provisions of Statutory Variation clause) shall be adjusted in basic price.

l. In case of delay in supply / execution of contract, vendor / contractor shall be liable to raise invoices for reduced value as per Price Reduction Schedule (PRS). Accordingly, GST will be applicable at the reduced value of the item. In case vendor / contractor raises invoice for full value, then vendor / contractor shall issue Credit note towards applicable PRS amount and corresponding applicable taxes.

In circumstances where vendor / contractor fails to submit the invoice with reduced value or does not issue credit note as mentioned above, Owner shall release payment to vendor / contractor after giving effect of the PRS clause with corresponding reduction of taxes charged on vendor / contractor's invoice.

m. E-way bills shall be issued by Contractor/Vendor except in cases of direct imports by Owner where e-way bill shall be issued by Owner. (Note-1)

n. In case of foreign bidders, for supervision/site-work/training, services by foreign supervisor at project site, GST shall be paid by Owner to tax authorities, if applicable under reverse charge mechanism. However, GST shall not be applicable on training provided at foreign bidder's work/training facilities in their country.

2. **IMPORT DUTIES:**

a. Direct supplies by foreign suppliers where, Owner becomes consignee:

i. For imported materials sold and consigned directly by foreign suppliers to owners, import duties i.e. Basic custom duty, Social welfare surcharge and IGST as applicable in India shall be directly paid by owner to tax authority.

ii. Bill of entry shall be filed by Owner or its authorized agency

b. Imported supplies by Indian suppliers as built in import content

i. Custom duties on the imported material shall be included in the quoted prices and supplier/contractor shall be responsible for the timely payment of the custom duties to the relevant government authority. All harbor dues/ pilotage fees, port fees, wharf fees, unloading costs incurred in India in respect of any imported goods shall be to supplier's/contractor's account. The contractor / vendor shall be fully responsible for Port and Customs clearance including preparation of bill of entry and other documents required for import and clearance of goods.

Domestic Bidder to consider Merit rate of custom duty. However, in case bidder is allowed after award of job, vide any other notification, a lower rate of custom duty than Merit rate of customs duty for import of materials and components, in such case bidder will ensure to pass on the benefit to client. Bidder shall ascertain the applicable rate of customs duty and shall be solely responsible towards applicability and correctness of such rates.

Bidder to indicate CIF value of import content and applicable Merit rate of basic custom duty rate, social welfare surcharge on custom duty and IGST included in quoted price, in the price schedule.

Statutory Variation in customs duty rate will be dealt with separately after receipt of materials at site against documentary evidence.

If in the bid, bidder has considered customs duty for import contents other than the Merit rate of customs duty in their offer, then statutory variation on the customs duty will not be applicable.

The supplier shall be responsible for, and shall exercise due diligence in properly classifying the goods and materials, undertaking the payment of custom duties, and/or otherwise complying with all applicable laws w.r.t. any import of the goods and materials.

In case owner/ Consultant is exposed to any penal action, interest /penalties by the custom authorities for incorrect declaration and /or valuation of the goods or material by the supplier, or otherwise on account of any breach of applicable laws in the course of the import of the goods and material by supplier, the supplier shall indemnify and hold harmless, Owner/Consultant for any and all costs, expenses or losses suffered or incurred by Owner/Consultant in this regard.

If bidder does not furnish built in CIF value and confirm that quoted prices are firm and fixed, in that case bidder shall not be entitled to claim any variation in the custom duties even if bidder has quoted their prices considering custom duties. In case of wrong assessment of customs duties by the contractor/ vendor, any additional liabilities towards taxes and duties shall be to contractor’s / vendor’s account.

c. General points:

i. The bidder must ascertain and confirm along with supporting documents in the bid, if any custom duty exemption/waiver is applicable to the products being supplied under any CEPA/FTA/multi-lateral/bi-lateral trade agreements between India and bidder's country.

ii. The bidder shall be liable to provide all documentation to ensure availment of the exemption/waiver.

In case the bidder defaults on this due to any reason, whatsoever, he shall be liable to bear the incremental custom duty applicable, if any.

iii. Any custom duty applicability on account of any change in the CEPA/FTA/ multi-lateral/bi-lateral trade agreement shall be to bidder's account.

iv. Documentation to be furnished for availing the exemption/waiver of custom duty shall be specifically listed in the letter of credit also as a prerequisite for release of payment against shipping documents and this documentation shall necessarily form a part of shipping documents.

3. **INCOME TAX:**

a. Foreign supervisors/contractors/vendors

Prices of site work, contracts and other services of foreign vendor shall be gross of income tax i.e., inclusive of Indian income tax at the applicable prevailing rate as per Indian Income Tax Rules.

Owner shall deduct tax at source the tax as applicable while making payments against each invoice for the services in India. Certificate for TDS shall be provided to the seller.

In case foreign bidder still quotes Prices of site work, contracts and other services net of income tax i.e., exclusive of Indian income tax at the applicable prevailing rate as per Indian Income Tax Rules, Owner shall deposit tax at source as applicable after grossing up the sums due while making payments against each invoice for the services in India.

Foreign supplier shall furnish the information required in line with the prevalent provisions of income tax including but not limited to tax residency certificate, form 10F, PAN etc.

Failing to provide above, the payment to supplier/contractor/consultant shall be subject to additional TDS as per the provisions of Indian Income Tax Act/Rules (without any financial implication on Owner).

b. Indian resident supervisors/contractors/vendors

Prices for site-work, contracts and other services/supplies of Indian vendors/ contractors shall be inclusive of income tax.

Tax shall be deducted at source by owner on all sums due in accordance with the provisions of Indian Income Tax Act/Rules as in force at the relevant point of time. Owner shall issue a tax deduction certificate to the bidder evidencing the tax deducted or withheld and deposited by owner on payments made to the bidder to enable the bidder to claim the credit of Tax deducted by owner.

c. The vendor/ contractor shall be responsible for complying with all the provisions of all the applicable laws and provide necessary documents as prescribed under the rules and regulations, as applicable from time to time. In particular, if any tax credit, refund or any other benefit is denied/delayed to Owner due to any non-compliance/ delayed compliance by the vendor/ contractor under the Income Tax Act (including but not limited to failure to upload the details of the sale on TRACES, failure to pay TCS to the government or due to non-furnishing or furnishing of incorrect or incomplete documents, non-filing of TCS return by the supplier), the vendor/ contractor shall be liable to reimburse Owner for all such losses and other consequences including but not limited to the tax loss, interest and penalty. Owner shall be entitled to recover such amount from the contractor/vendor by way of adjustment from the next invoice, encashment of PBG or by way of any other means.

C. INVOICING METHODOLOGY W.R.T. TAXATION

1. In case of domestic / foreign PO's, invoice shall be raised in the name of owner and consignee shall be owner. (Note-3)

2. In case of package MR's and tenders, vendor/ contractor shall bring material at site in their own name and Vendor/ Contractor shall be consignee. Invoice shall be raised by Vendor/ Contractor in the name of Owner. (Note-3)

D. APPLICABILITY OF TAX CREDIT

The Input tax credit @ 13 % of GST amount shall be considered for items/services not falling under Section 17 (5) of CGST Act, 2017. No Input Tax credit applicable on Civil Works. (Note-4)

E. EVALUATION METHODOLOGY W.R.T. TAXES:

Following shall be loaded for evaluation:

1. Applicable Custom Duty (including BCD, Surcharge, Anti-Dumping Duty etc. but excluding IGST, which shall be dealt as per bid evaluation methodology given in E2 below) shall be loaded for the price bid evaluation in respect of supplies for which Bill of Entry has to be filed by Owner.

2. GST Loading:

a. Output GST quoted by the Vendor/ Contractor shall be loaded for Price Bid Evaluation wherever Input Tax Credit is not available to Owner for goods and/ or services not eligible for Input Tax Credit as per Section 17(5) of CGST Act like Civil works.

b. 87% of input credit on Output GST as quoted by the Vendor/ Contractor shall be considered for Price Bid Evaluation in all other cases.

c. Cess under GST, if quoted, shall also be loaded for Price Bid Evaluation.

3. Applicable Income tax, in case foreign bidder quotes net of taxes.

F. TAXATION TERMS FOR INDIAN SOURCED SUPPLIES (Applicable in case of foreign supplier) - Shall be the same as applicable for Indian bidders.

G. TAX IMPLICATION WHERE FABRICATION YARD IS OUTSIDE THE REFINERY PREMISES, WHEREVER APPLICABLE

In case of package MR's and tenders, since contractors/suppliers shall bring material in their own name and raise invoice to owner (as per payment milestone achieved) after charging CGST/SGST, location of fabrication yard whether inside or outside refinery will not attract any additional liability.

Where owner issues FIM's to contractors/vendors, material will be released against delivery challan and such FIM shall he received back in refinery premises as per provision of GST.

H. STATUTORY VARIATION

1. Tenders

No variation on account of taxes and duties, statutory or otherwise, shall be payable to vendor/contractor except for the following:

GST: If after the due date of submission of last price bid and upto the contractual completion period (including extended contractual completion period for the reasons attributable to Owner or due to Force Majeure condition), any increase/decrease occurs in the applicable rate of GST, the variation in such GST shall be to Owner's account and shall be adjusted (increase / decrease) to / from the Vendor/contractor's invoices based on the documentary evidence.

Any increase in GST after the contractual completion period (including extended contractual completion period for the reasons attributable to Owner or due to Force Majeure condition) shall be to Contractor's account. However, any decrease in the rate of GST shall be passed on to Owner.

For calculating Statutory Variations ceiling amount as declared by the Bidder in price schedule shall only be considered.

<u>Basic Custom Duty & Social welfare surcharge:</u>

If after the due date of submission of last price bid and upto the 90% of contractual completion period (including extended contractual completion period for the reasons attributable to Owner or due to Force Majeure condition), any increase/decrease occurs in the applicable rate of Basic Customs duty & Social welfare surcharge on materials imported, the variation in such Basic Customs duty & Social welfare surcharge shall be to owner's account and shall be adjusted (increase/decrease) to/from the Vendor/contractor's invoices based on the documentary evidence.

Any increase in Basic Customs duty & Social welfare surcharge on materials imported after the 90% of the contractual time for completion / extended Time for Completion (by Owner due to reasons attributable to Owner or due to Force Majeure) shall be to Vendor/contractor's account. However, any decrease in the rate of Basic Customs Duty & Social welfare surcharge on materials imported shall be passed on to owner.

For calculating Statutory Variations ceiling amount as declared by the Bidder in price schedule shall only be considered.

Note: Statutory variations on IGST (included in quoted prices) in case of imported materials from outside India in Vendor/contractor's name shall be to vendor/contractor account.

Any new taxes, duties, cess, levies notified or imposed after the due date of submission of last /final price bid but before the contractual date of completion of work (including extended contractual completion period for the reasons attributable to Owner or due to Force Majeure condition) shall be to Owner's account. These shall be reimbursed against documentary evidence. However, in case of delay attributable to vendor/contractor, any new or additional taxes and duties imposed after Time for Completion, as above, shall be to Vendor/Contractor's account

2. MR's

No variation on account of taxes and duties, statutory or otherwise, shall be payable to vendor except for the following:

GST: If after the due date of submission of last price bid and upto the contractual delivery period (including extended contractual delivery period for the reasons attributable to Owner or due to Force Majeure condition), any increase/decrease occurs in the applicable rate of GST, the variation in such GST shall be to Owner's account and shall be adjusted (increase / decrease) to / from the vendor's invoices based on the documentary evidence.

Any increase in GST after the contractual delivery period (including extended contractual delivery period for the reasons attributable to Owner or due to Force Majeure condition) shall be to vendor's account. However, any decrease in the rate of GST shall be passed on to Owner.

Basic Custom Duty &Social welfare surcharge:

If after the due date of submission of last price bid and upto the 2/3rd of contractual delivery period (including extended contractual delivery period for the reasons attributable to Owner or due to Force Majeure condition), any increase/decrease occurs in the applicable rate of Basic customs duty & social welfare surcharge on materials imported, the variation in such Basic Customs duty & social welfare surcharge shall be to Owner's account and shall be adjusted (increase/decrease) to/from the vendor's invoices based on the documentary evidence.

Any increase in Basic Customs duty & Social welfare surcharge on materials imported after the 2/3rd of the contractual time for delivery/extended time for delivery (by Owner due to reasons attributable to Owner or due to Force Majeure) shall be to vendor's account.

However, any decrease in the rate of Basic Customs Duty & Social welfare surcharge on materials imported shall be passed on to owner.

For calculating Statutory Variations ceiling amount of CIF value as declared by the Bidder in price schedule shall only be considered.

Note: Statutory variations on IGST (included in quoted prices) in case of imported materials from outside India in vendor's name shall be to vendor account.

Any new taxes, duties, cess, levies notified or imposed after the due date of submission of last /final price bid but before the contractual date of delivery (including extended contractual delivery period for the reasons attributable to Owner or due to Force Majeure condition) shall be to Owner's account. These shall be reimbursed against documentary evidence. However, in case of delay attributable to vendor, any new or additional taxes and duties imposed after Time for Completion, as above, shall be to vendor's account.

I. TAX INDEMNITY:

Any errors of interpretation of applicability of taxes and duties by the contractor/vendor shall be on contractor's/vendor's account.

Any fine, penalty or levies, required to be met by the Owner, arising out of non-compliance with respect to Indian taxation provisions by contractor/vendor including their personnel or such third party, shall be recovered from the amounts payable to the Contractor/vendor.

TERMS & CONDITIONS ANNUAL MAINTENANCE CONTRACT (AMC)

a. Bidder shall quote for the Post Warranty Annual Maintenance Contract as per scope defined in Material Requisition. Also furnish the year wise Break-up as per the Price Schedule.

b. The AMC Charges quoted in Price Schedule Format shall be inclusive of all the charges for Transportation, Lodging, Boarding, all insurances including third party insurance, all Taxes & Duties and all other incidental charges etc. but excluding Goods & Service tax (GST) which shall be payable extra at actual on Submission of Invoice as per GST rules. Owner will not have any liability, whatsoever, over and above the quoted prices.

c. The payment terms for the AMC- Refer Annexure-I to SPC.

d. The order for AMC will be placed before the expiry of contractual Warranty Period. The price of AMC services will remain firm & fixed for the complete execution of AMC contract. In case there is delay in start of AMC from the date of expiry of warranty period, the charges shall be paid on prorata basis for the duration curtailed from original specified AMC period.

e. CPBG- Refer Annexure-I to SPC.

f. Periodic and Preventive maintenance: Vendor shall depute their engineers to installation site as & when required for regular checkups, as part of periodic maintenance. Vendor shall also depute their service engineers periodically for preventive maintenance, major repairs / replacement and reporting. Price shall also include emergency visits as necessary.

g. Scope of AMC shall be as per MR. The quoted lumpsum rate shall include providing all manpower, machineries and materials required to carry out the work as per scope of work of AMC defined in the MR.

Bidder's Acceptance:

RFQ No. :

Item :

Offer No. :

Signature with Name & Date and

Seal/Stamp of the Bidder

TERMS & CONDITIONS FOR INDIAN SOURCED COMPONENTS SERVICES BY FOREIGN BIDDER

Foreign bidder may source components / sub-supplies and services from India, if allowed as per Material Requisition. For such sub-supplies / services, Commercial Terms & Conditions of the RFQ shall stand modified to the following extent:

1. **PRICING:**

   1.1 Unit and total price on FOT Despatch Point basis including packing and forwarding charges.

   1.2 Details of Taxes and duties (rates) payable extra on the finished goods, applicable on Indian sub suppliers.

   1.3 Separate and clear break-up of charges for inland transportation is to be quoted by the bidder.

   1.4 Materials if ordered against the RFQ are required to be dispatched on door delivery basis through a reliable bank approved Road Transport Company.

   1.5 Transit insurance of Indian sub supplies shall be borne and arranged by the NRL.

2. **CURRENCY OF QUOTE:**

   The quoted price of sub-supplies/ services shall be in Indian Rupees only.

3. **AWARD OF ORDER:**

   Foreign Principal shall be the single point responsible Vendor and separate order to Indian sub-supplier for Indian sourced supply/site work/site services in INR shall be issued with suitable interlinking clause.

4. **DELIVERY:**

   The delivery period for sub-supplies shall be on FOT site basis within specified delivery period for foreign bidder as per Terms of RFQ/Bidding document.

5. **PRICE REDUCTION SCHEDULE:**

   PRS shall be applicable in totality on foreign scope + Indian sourced component / site work for delay in supply of goods/ site work either by foreign principals or Indian counterpart.

6. **PAYMENT TERMS:**

   Refer Annexure-I to SPC

7. **CONTRACT PERFORMANCE BANK GUARANTEE:**

   7.1 Foreign principal shall submit the Contract performance bank guarantee for 3% of total order value including value of foreign portion and Indian sourced components/ services.

   7.2 For arriving the BG values in single foreign currency, the Indian supply portion shall be converted into equivalent USD/ EURO/ JPY/ SGD / GBP (as applicable) by considering SBI Bill Selling rate of foreign exchange published on the day of opening of the Price Bids.

TERMS & CONDITIONS FOR SUPERVISION OF ERECTION, TESTING & COMMISSIONING / TRAINING AT SITE

1. Bidder shall quote per diem charges which shall include lodging, boarding, medical, local transport, all insurances including Bidder's personnel and third party insurance, all other incidental charges and all taxes & duties except Goods & Service tax (GST) (for bidders registered in India) which shall be quoted extra and shall be payable against submission of Invoice as per GST tax rules.
2. Taxes as per Government policy shall be deducted at source by Purchaser while making payments against each invoice.
3. For Foreign Bidders : To & fro air fare by economy class through most economical route preferably by Air India and/or AC 2 Tier by Train Fare(*) within India nearest to site *(Nearest International Airport :-Kolkata/Guwahati, Nearest Railhead :- Kolkata)*, will be reimbursed at actual. Local transportation in bidder's country shall be to bidder's account.
   (*)In case a bidder travel's by any other mode of transport, the payment shall be made against documentary evidence subject to maximum of AC 2 Tier train fare.
4. For Indian Bidders: To & fro air fare by economy class through most economical route preferably by Air India and/or AC 2 Tier by Train Fare(*) nearest to site *(Nearest International Airport :-Kolkata/Guwahati, Nearest Railhead :-Kolkata)*, will be reimbursed at actual.
   (*)In case a bidder travel's by any other mode of transport, the payment shall be made against documentary evidence subject to maximum of AC 2 Tier train fare.
5. Per diem charges shall be payable from the day bidder's person reaches site upto the day he leaves the site. No payment will be made for travel days/period.
6. In case bidder's representative is not called for during Intervening weekly off/Holidays, the same shall be payable at the normal rate of site services. However, in case Seller's representative is called at site during weekly off/Holiday, the same shall be paid @ overtime rate quoted extra by bidder.
7. In case bidder's representative takes leave, per diem charges for that day shall not be payable.
8. Working hours prevailing at site, normally 8 hours/day - Monday through Saturday and holidays as applicable to Purchaser's site personnel shall apply.
9. Selection of Foreign/ Indian supervisory personnel shall be left to Owner's/Purchaser's choice.
10. Vendor's supervisory personnel shall observe/abide by site working conditions prevailing at the existing site, safety codes, Indian laws and local laws.
11. A notice period of 15 days will be given for mobilization of supervisory personnel for supervision of erection.
12. Validity period of per diem rate shall be upto the end of guarantee period. Further, in case services for supervision are required after the guarantee period, 8% annual escalation shall be applicable.
13. Payment: Refer Annexure-I to SPC.
14. Requirement of Employment Visa for Foreign Nationals- Refer SPC.

Bidder's Acceptance:

RFQ No. :
Item :
Offer No. :

Signature with Name & Date and
Seal/Stamp of the Bidder

TERMS & CONDITIONS FOR INSTALLATION/ SITE WORK (in supply items)

1. The Bidder shall perform their jobs in eco-friendly manner and in consonance with the objectives of NRL / EIL.

2. Construction / erection work for several other project facilities at various locations within refinery site will be progressing concurrently. It will be the responsibility of Bidder to seek approvals from NRL/EIL for working within & outside the refinery limits including gate pass for their manpower and construction equipments etc. and also of taking all suitable safety measures as per regulations in force for the safety of existing refinery.

3. The material shall be collected by the Bidder from NRL's stores/ Project Site/ Bidder's own stores (as the case may be) and transported to the erection site at Bidder's own cost and risk.

4. All labour (both skilled and unskilled), tools, tackles and consumables, shall be arranged by Bidder at his own cost.

5. Bidder shall arrange for the necessary transport, accommodation, medical, canteen and other facilities for their employees/staff at their own cost and abide by all labour laws, safety codes and statutory regulations and keep EIL/NRL indemnified in respect thereof.

6. Though insurance for the project for permanent incorporation of material and services shall be covered by NRL under Marine cum Erection Insurance policy. However, supplier / sub-contractor shall take insurances as per international practice including but not limited to the following:

   a. Workman's compensation insurance, covering all employees of supplier / Sub-contractor and their personnel for statutory benefits as set out and required by law (Indian in the area of operation or area in which supplier / sub-contractor may become legally obliged to pay benefits for bodily injury or death.

   b. Transit / Travel insurance and Medical insurance.

   c. Insurance against fire, theft, damages and loss of all property owned by supplier / sub-contractor at the construction site.

   d. Group Personnel Accident insurance covering supplier/sub-contractor's employees, not otherwise already covered under above, operating from project site as per supplier / sub-contractor's established practices.

   e. Cover against all risk for the materials issued by EIL/NRL.

   f. Bidder shall be working at NRL's site along with agencies that will be engaged in the other activities. For this purpose the third party risk shall also be covered by Bidder.

7. The Bidder is responsible for keeping his work place neat and clean and shall always avoid scattering of any materials around the work place. The Bidder shall clear the work site of all debris, materials, tools, tackles etc. immediately upon completion of the job. Any temporary Line/cables etc. laid for the purpose of execution of a particular job shall be immediately removed to an agreed location and the site cleared off all such materials.

8. The Bidder shall not throw out gaskets, used electrode pieces, hand gloves, cotton wastes, gunny bags, polythene bags etc. into open channel, any drains or pipe line system. These are to be collected together and deposited in bins/waste collectors earmarked for the purpose of disposal after consultation with Engineer-in-Charge. Disposal of surplus earth/ debris/rocks shall be outside the plant boundary.

9. LAND FOR FOR SITE OFICE AND RESIDENTIAL ACCOMODATION

The land shall be allocated by Owner to the Bidder free of Charge limited to the area required for temporary site office. Additional land (if required by Bidder) over and above the allocated land shall have to be arranged by the Bidder at their own cost.

No land shall be provided for accommodation purposes to the Bidder, or the purposes of any Bidder's personnel.

The sub-contractor shall remove all temporary buildings/ facilities etc. immediately after completion of works in all respects.

10. CONSTRUCTION POWER, WATER, LAND FOR FABRICATION YARD CONSTRUCTION

i. Construction Power & Water:

Construction Water

The Contractor shall make his own arrangements of construction as well as drinking water & testing water at his own cost. Water used for the construction/ testing activities shall meet the necessary requirements as laid down in specifications. Required mandatory tests shall be carried out as per specifications.

Subject to availability, Construction water shall be provided by the Owner on free of cost basis for work inside the Refinery Complex. However, in case the Owner is not able to provide construction water due to any reason whatsoever, the Contractor shall be responsible for making all arrangements for Construction water at his own cost. Any statutory requirements/ documentation etc. to this effect shall be met by the Contractor.

However, in case of non-availability of above due to any reasons, Contractor shall be responsible for making all arrangements for construction water at his cost. Any statutory requirements/documentation etc. to this effect shall also be met by the Contractor.

Non-availability of water due to any reason shall not entitle the Contractor for any claim against OWNER/EIL on account of cost and time implications.

Construction Power

The Contractor shall make his own arrangements for Construction Power required for carrying out the scope of works as per Bidding Document.

Subject to availability, construction power shall be provided by the Owner inside the Refinery complex from the nearest Substation / tapping point on free of cost basis upto a maximum power consumption of 400 KVA. If during the execution stage, the Contractor requires more construction power from Owner, then the same shall be on chargeable basis @ Rs. 9.00 per KW Hour.

However, in case OWNER is not able to provide construction power, Contractor shall be responsible for making all arrangements for construction power at his cost. Any statutory requirements/documentation etc. to this effect shall also be met by the Contractor.

Further, non-availability of construction power or due to any other reasons shall not entitle the Contractor for any claim against OWNER on account of time and cost implications. Therefore, the Contractor shall within the contract price make alternative arrangements to cope with such eventuality.

Additional power, if required, to meet the contractual requirements, shall be arranged by the Contractor at its own cost.

OWNER shall recover the cost of power supply every month at prevailing rate (without prejudice to any other mode of recovery available to OWNER) by deduction from the Contractor's bills. The energy meter to be installed by the Contractor shall be tested and certified by State Electricity Board or any other agency approved by OWNER/ EIL.

ii. Owner is in the process of acquiring Tea Garden Land adjacent to northern boundary wall of the refinery having access from inside the refinery site. The land required for setting up of temporary facilities for Fabrication Yard (including blasting & painting), Storage Area, Warehouses and Laydown area will be provided at free of cost in the above site after removing the tea bushes by the Owner Depending on the availability. The required construction water, power will be provided by the Owner at a single point near the TCF.

iii. Additional Land (if required) for setting up of temporary facilities like Batching Plant, Labour Hutments etc., shall be arranged by Contractor at their-own cost outside the Refinery Premises. All the infrastructure arrangements in connection with these facilities including Water, Power and Security Arrangements etc. shall be in the scope of Contractor without any extra cost to Owner.

11. All Cranes, handling equipment etc. as required, shall be arranged by bidder at his own cost.

12. As per the applicable Factory Act, the Labour License, if required, shall be taken by Bidder before starting the works.

13. All necessary compliances to various statutory requirements including Factories Act, Labour Welfare legislations, PF & ESI etc. shall be bidder's responsibility.

14. Necessary tax registrations etc., if any, shall be bidder's responsibility.

15. The Contractor shall adhere to the Health, Safety and Environment (HSE) management system as per EIL specification no. 6-82-0001, OISD Guidelines 192 and OISD Guidelines 207, enclosed.

16. The Contractor shall adhere & comply with the requirements as per NRL USER MANUAL on E-WORK PERMIT SYSTEM & applicable Job Safety plan, enclosed.

17. It shall be bidder's responsibility to comply with all rules and regulations in force at construction site.

18. Surplus material, if any, after completion of site work, shall not be allowed to be taken out of the NRL site premises if Owner has paid for the surplus materials.

19. Contractor to follow the appropriate system for movement of equipment/ materials/ items inside refinery area. Format for Indemnity Bond is enclosed.

Enclosures:

i. Standard Specification for Health, Safety & Environmental (HSE) Management at Construction Sites Doc. No. 6-82-0001
ii. OISD Guidelines 192
iii. OISD Guidelines 207
iv. NRL USER MANUAL on E- WORK PERMIT SYSTEM
v. Job Safety plans (JSP1 to JSP10)

निर्माण स्थल पर स्वास्थ्य, सुरक्षा एवं पर्यावरण प्रबंधन हेतु मानक विनिर्देश

STANDARD SPECIFICATION FOR HEALTH, SAFETY & ENVIRONMENTAL MANAGEMENT AT CONSTRUCTION SITES

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					Approved by	
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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

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1.0 SCOPE

This specification establishes the Health, Safety and Environment (HSE) management requirement to be complied by Contractors/Vendors including their sub-contractors/sub vendors during construction.

This specification is not intended to replace the necessary professional judgment needed to design & implement an effective HSE system for construction activities and the contractor is expected to fulfill HSE requirements in this specification as a minimum. It is expected that contractor shall implement best HSE practices beyond whatever are mentioned in this specification.

Requirements stipulated in this specification shall supplement the requirements of HSE Management given in relevant Act(s)/ Legislations, General Conditions of Contract (GCC), Special Conditions of Contract (SCC) and Job (Technical) Specifications. Where different documents stipulate different requirements, the most stringent shall apply.

2.0 REFERENCES

The document should be read in conjunction with following:

- General Conditions of Contract (GCC)
- Special Conditions of Contract (SCC)
- Building and other construction workers Act, (Refer Appendix-D)
- Indian Factories Act,(Refer Appendix-D)
- Job (Technical) specifications
- Relevant International/ National Codes (refer Appendix-A for standards/codes on HSE)
- Relevant State & National Statutory requirements.
- Operating Manuals Recommendation of Manufacturer of various construction Machineries
- Occupation Health and Safety Management System (OHSAS 18001:2007/ISO 45001) and Environmental Management System (ISO 14001:2015)

3.0 REQUIREMENTS OF HEALTH, SAFETY & ENVIRONMENTAL (HSE) MANAGEMENT SYSTEM TO BE COMPLIED BY BIDDERS

3.1 Management Responsibility

3.1.1 HSE Policy & Objectives

The Contractor should have a documented and duly approved HSE policy &objectives to demonstrate commitment of their organization to ensure health, safety and environmental aspects in their line of operations.

The Contractor's senior management shall provide strong visible leadership and continuously demonstrate commitment to develop, operate and maintain, review and continually improve a HSE culture at site which empowers individuals to take responsibility for their safety and embrace and accept nothing but responsible HSE behaviour.

Contractor shall refer in clause No. 3.3.23 for Key Performance Indicator (KPI).

3.1.2 Management System

The HSE management system of the Contractor shall cover the HSE requirements & commitments to fulfill them, including but not limited to what have been specified under clauses 1.0 and 2.0 above. The Contractor shall obtain the approval of its site specific HSE Plan from EIL/ Owner prior to commencement of any site works. Corporate as well as Site management of the Contractor shall ensure compliance of their HSE Plan at work sites in its entirety in true spirit.

3.1.3 Indemnification

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Contractor shall indemnify & hold harmless, Owner/EIL & their representatives, free from any and all liabilities arising out of non-fulfillment of HSE requirements or its consequences.

3.1.4 Deployment &Qualifications of Safety Personnel

The Contractor shall designate/deploy various categories of HSE personnel at site as indicated below insufficient number. In no case, deployment of safety Supervisor / Safety Steward shall substitute deployment of Safety Officer / Safety Engineer what is indicated in relevant statute of BOCW Act i.e. deployment of safety officer/Safety Engineer is compulsory at project site. The Safety supervisors, Safety stewards/Observer etc. would facilitate the HSE tasks at grass root level for construction sites and shall assist Safety Officer /Engineers.

Contractor shall appoint safety personnel as given below for every work shift:

(i) Safety Observer/Steward: Contractor shall depute one Safety Observer/Steward for every 100 workers or part thereof

(ii) Safety Supervisor: In addition to above(i), contractor shall depute one Safety Supervisor for every 250 workers or part thereof

(iii) Safety Engineer: In addition to above (i&ii), one safety engineer/ officer for every 1000 workers or part thereof.

Contractor shall intimate/obtain prior permission from EIC before demobilizing any safety personnel. The Contractor shall mobilize suitable safety personnel as replacement.

a) Safety Steward/Observer

As a minimum, he shall possess class XII pass certificate and trained in fire-fighting as well as in safety/occupational health related subjects, with minimum two year of practical experience in construction work environment and should have adequate knowledge of the local language spoken by majority of the workers at the construction site.

b) Safety Supervisor

As a minimum, he shall possess a recognized graduation Degree in Science (with Physics & Chemistry) or a Diploma in Engg. Or Tech. with minimum Two years of practical experience in construction work environment and should possess requisite skills to deal with construction safety & fire related day-to-day issues.

c) Safety Officer / Safety Engineer

Safety Officer/Engineer should possess following qualification & experience:

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(i) Recognized degree in any branch of Engg. or Tech. or Architecture with practical experience of working in a building or other construction work in supervisory capacity for a period of not less than two years, **or** possessing recognized diploma in any branch of Engg. or Tech with practical experience of working in a building or other construction work in supervisory capacity for a period of not less than five years.

(ii) Recognized degree or one year diploma in Industrial safety(from any Indian Institutes recognized by AICTE or State Council of Tech. Education of any Indian State/Union territory) with at least one paper in construction safety (as an elective subject).

(iii) Preferably have adequate knowledge of the language spoken by majority of the workers at the construction site.

Alternately

(i) Person possessing Graduation Degree in Science with Physics **or** Chemistry and degree or one year diploma in Industrial Safety (from any Indian institutes recognized by AICTE or State Council of Tech. Education of any Indian State/ Union Territory) with practical experience of working in a building, plant or other construction works (as Safety Officer, in line with Indian Factories Act, 1948) for a period of not less than five years, may be considered as Safety Officer.

d) HSE In-Charge

In case there is more than one Safety Officer at any project construction site, one of them, who is senior most by experience (in HSE discipline), may be designated as HSE In-Charge. Duties & responsibilities of such person shall be commensurate with that of relevant statute and primarily to coordinate with top management of EIL/Client and contractors.

In case the statutory requirements i.e. State or Central Acts and / or Rules as applicable like the Building and Other Construction Workers' Regulation of Employment and Conditions of Service- Act,1996 or State Rules (wherever notified), the Factories Act, 1948 or Rules (wherever notified), etc. are more stringent than above clarifications, the same shall be followed.

Contractors shall ensure physical availability of safety personnel at the place of specific work location, where Hot Work Permit is required/granted. No work shall be started at any of the project sites until above safety personnel & concerned Site Engineer of Contractor are physically deployed at site. The Contractor shall submit a HSE Organogram clearly indicating the lines of responsibility and reporting system and elaborate the responsibilities of safety personnel in their HSE Plan.

Upon fulfilling the basic requirement of qualification and relevant experiences, the performance of contractor HSE personnel's is to be monitored.

The good performing contractor's HSE personnel at site shall be rewarded upon assessment of performance by EIL/Owner. The non-performing HSE personnel shall be counselled by EIL/Owner & suitable action may be taken for suspension from site for 3-6 days. Contractor shall arrange training for non performing HSE personnel.

HSE In –Charge of the contractor shall be given the status at par with the other heads of department and shall report to Head of Project.

The Contractor shall verify & authenticate credentials of such safety personnel and furnish Bio-Data/Resume/Curriculum Vitae of the safety personnel as above for EIL/Owner's approval, at least 1 month before the mobilization. The Contractor, whenever required, shall arrange submission of original testimonials/certificates of their Safety personnel, to EIL/Owner (for verification/scrutiny, etc.)

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Imposition/ Realization of penalty shall not absolve the Contractor from his/her responsibility of deploying competent safety officer at site.

Adequate planning and deployment of safety personnel shall be ensured by the Contractor so that field activities do not get affected because of non-deployment of competent & qualified safety personnel in appropriate numbers.

3.1.5 **Implementation, Inspection/Monitoring**

a) The Contractor shall be fully responsible for planning, reporting, implementing and monitoring all HSE requirements and compliance of all laws & statutory requirements.

b) The Contractor shall also ensure that the HSE requirements are clearly understood & implemented conscientiously by their site personnel at all levels at site.

c) The Contractor shall ensure physical presence of their field engineers / supervisors, during the continuation of their contract works / site activities including all material transportation activities. Physical absence of experienced field engineers / supervisors of Contractor at critical work spot during the course of work may invite halting / stoppage of work.

d) The Contractor shall regularly review inspection report internally and implement all practical steps / actions for improving the status continuously.

e) Contractor skilled workmen like riggers, scaffold erectors, welders, crane operators etc. should have sufficient past experience and skill on the relevant job.

f) The Contractor shall ensure important safety checks right from beginning of works at every work site locations and to this effect format No. HSE-10 "Daily Safety Check List" shall be prepared by field engineer & duly checked by safety personnel for conformance.

g) The Contractor shall carry out inspection to identify various unsafe conditions of work sites/machinery/equipment's as well as unsafe acts on the part of workmen/supervisor/engineer while carrying out different project related works.

h) Adequate records for all inspections shall be maintained by the Contractor and the same shall be furnished to EIL/Owner, whenever sought.

i) To demonstrate involvement/commitment of site management of Contractor, at least one Monthly Safety Walk through in a month shall be carried out by Contractor's head of site (along with his area manager/field engineers)and a report shall be furnished to EIL/Owner as per format No: HSE-1" Safety walk through report" followed by compliance for unsatisfactory remarks.

j) As a general practice lifting tools/tackles, machinery, accessories etc. shall be inspected, tested and examined by competent person(approved by concerned State authorities) before being used at site and also at periodical interval (e.g. during replacement, extension, modification, elongation/reduction of machine/parts, etc.) as per relevant statutes. Hydraulic Mobile Crane, cranes, lifting machinery, mobile equipment's/ machinery/ vehicles, etc. shall be inspected regularly by only competent / experienced personnel at site and requisite records for such inspections shall be maintained by contractor. Contractor shall also maintain records of maintenance of all other site machinery (e.g. generators, rectifiers, compressors, cutters, etc.) & portable tools/equipment's being used at project related works (e.g. drills, abrasive wheels, punches, chisels, spanners, etc.).The Contractor shall not make use of arbitrarily fabricated 'derricks' at project site for lifting/ lowering of construction materials.

k) Site facilities /temporary. installations, e.g. batching plant, cement godown, DG-room, temporary electrical panels/distribution boards, shot-blasting booth, fabrication yards, etc. and site welfare facilities, like labour colonies, canteen/pantry, rest-shelters, motor cycle/bicycle-shed, First-aid centers, urinals/toilets, etc. should be periodically inspected by Contractor (preferably utilizing HR/Admin. personnel to inspect site welfare facilities) and records to be maintained.

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3.1.6 **Behaviour Based Safety**

a) The contractor shall develop a system to implement Behavior-Based Safety (BBS) through which work groups can identify, measure and change the behaviors of employees and workers towards construction safety aspects.

b) The BBS process shall include the following:
- Identify the behaviors critical to achieve required safety performance.
- Communicate the behaviors and how they are performed correctly byall
- Observe the work force and record safe/at risk behaviors. Intervene with workers to give positive reinforcement when unsafe behaviors are observed. Provide coaching/correction when at risk behaviors are observed
- Collect and record observation data
- Summarize and analyze observation data
- Communicate observation data and analysis results to all employees
- Provide recognition or celebrate when safe behavior improvements occur
- Change behaviors to be observed or change activators or change consequences as appropriate.
- Communicate any changes to workforce

c) Contractor through its own HSE committee shall implement the above process.

d) The necessary procedures and Monthly reporting formats shall be developed by the contractor for approval by EIL/Owner.

e) The HSE committee of contractor shall observe individual's behavior for safe practices adapted for utilization/execution of work for followings a minimum:-
- PPE
- Tools & equipment's
- Hazard Identification & control
- House keeping
- Confined space entry
- Hot works
- Excavation
- Loading & unloading
- Work at height
- Stacking & storage
- Ergonomics

f) EIL/Owner and Contractor's site staff at all levels shall monitor the behavior of contractor employees that create and/or contribute to the unsafe situations at work place.

g) Contractor shall arrange Behavior Based safety (BBS) training of their employees at site on yearly basis.

3.1.7 **Awareness and Motivation**

a) The Contractor shall promote and develop awareness on Health, Safety and Environmental protection among all personnel working for the Contractor.

b) The contractor shall display safety statistics board at all prominent location .Also shall provide dedicated notice board for displaying of safety alerts or any other safety related notices for awareness site workforces.

c) Regular awareness programs and fabrication shop/work site meetings at least on monthly basis shall be arranged on HSE activities to cover hazards/risks involved in various operations during construction.

d) Contractor's workmen & supervisory staff shall participate in common Tool Box Meeting as & when organized/required at site to avoid any incident/accident or occupational disease arising out of multidisciplinary jobs/activities being performed by various contracting agencies in the same location at different elevation.

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e) Contractor to motivate & encourage the workmen & supervisory staff by issuing/ awarding them with tokens/ gifts/ mementos/ monetary incentives/ certificates etc. The motivational program shall be organized on regular basis.

f) Contractor shall assess & recognize the behavioral change of its site engineers / supervisors periodically and constantly motivate / encourage them to implement HSE practices at project works

g) Life Saving Rules (refer Appendix-I for details) are to be displayed at prominent location of site.

3.1.8 **Fire Prevention & First-Aid**

The Contractor shall deploy First aider & suitable First-aid measures such as First Aid Box (Refer Appendix-B for details), stand-by Emergency Vehicle. Additionally separate ambulance with trained personnel/male or female nurse to administer First Aid shall be provided by the Contractor beyond deployment of 500 workmen during day/night working hours.

a) The Contractor shall arrange installation of fire protection measures such as adequate number of steel buckets with sand & water and adequate number of appropriate portable fire extinguishers (Refer Appendix-C for details) to the satisfaction of EIL/Owner.

b) The Contractor shall arrange EMERGENCY MOCK DRILL like fire, bomb threat, gas leakage, earth quake, etc. at each site at least once in three months, involving site workmen and site supervisory personnel & engineers. The Contractor shall maintain record of such mock drills at project site.

c) The contractor shall require to tie-up with the hospitals located in the neighborhood for attending medical emergency.

3.1.9 **Documentation**

The Contractor shall evolve a comprehensive, planned and documented system covering the following as a minimum for implementation and monitoring of the HSE requirements and the same shall be submitted for approval by owner/EIL.

- HSE Organogram
- Site specific HSE Plan
- Safety Procedures, forms and Checklist. Indicative list of HSE procedures is attached as Appendix :H
- Inspections and Test Plan
- Risk Assessment & HIRAC for critical works.
- HIRAC Register as per Format no: HSE-19 to identify, assess, analyze & mitigate the construction hazards& incorporate relevant control measures before actually executing site works.
- Environmental Aspect Impact Register as per Format no: HSE-18 (identify, assess, analyze & mitigate the environmental impact & incorporate relevant control measures).
- Legal Register to identify and comply to all applicable HSE related legal requirements.

The monitoring for implementation shall be done by regular inspections and compliance of the observations thereof. The Contractor shall get similar HSE requirements implemented at his sub-contractor(s) work site/office, if applicable. However, compliance of HSE requirements shall be the responsibility of the Contractor. Any review/approval by EIL/Owner shall not absolve contractor of his responsibility/liability in relation to fulfilling all HSE requirements.

3.1.10 **Audit**

Safety Audit shall be conducted at initial stage by EIL/Owner to understand the readiness to start the job after mobilization of contractor's RCM at site& Suitable action shall be taken by contractor to comply the audit observation(s).

The Contractor shall submit an Audit Plan to EIL/Owner indicating the type of audits covering following as minimum:

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a) Internal HSE audits regularly on six monthly basis by engaging internal qualified auditors (viz. safety officers/Construction personnel having 5years experience in construction safety and Lead Auditor Course: OHSAS 18001/ISO 45001 certification).However, minimum two internal HSE audit will have to be conducted irrespective of time period of the contract.

b) External HSE audits regularly on yearly basis by engaging authorized auditing agencies (viz. National Safety Council etc.)or qualified external auditors (viz safety officers/Construction personnel having 10years experience in construction safety and Lead Auditor Course: OHSAS 18001/ISO 45001certification). However, minimum one external HSE audit will have to be conducted irrespective of time period of the contract.

c) EIL/Owner may participate in Opening and closing meeting of external audits and provide inputs to the external auditor. Outcome of external audit shall be discussed during HSE Meeting with EIL/Owner.

All HSE shortfalls/ non-conformances on HSE matters brought out during review/audit, shall be resolved forthwith(generally within a week) by Contractor& compliance report shall be submitted to EIL/Owner.

In addition to above audits by contractor, the contractor's work shall be subjected to HSE audit by EIL/Owner at any point of time during the pendency of contract. The Contractor shall take all actions required to comply with the findings of the Audit Report and issue regular Compliance Reports for the same to OWNER/ EIL till all the findings of the Audit Report are fully complied.

Failure to carry-out HSE Audits& its compliance (internal & external) by Contractor, shall invite penalization.

3.1.11 **Meetings**

i. The Contractor shall ensure participation of his top most executive at site (viz. Resident Construction Manager / Resident Engineer/ Project Manager / Site-in-Charge) along with safety officer in Safety Committee/HSE Committee meetings arranged by EIL/Owner usually on monthly basis or as and when called for. In case Contractor's top most executive at site is not in a position to attend such meeting, he shall inform EIL/Owner in writing before the commencement of such meeting indicating reasons of his absence and nominate his representative – failure to do so may invite very stringent penalization against the specific Contractor, as deemed fit as per Contract. The obligation of compliance of any observations during the meeting shall be always time bound. The Contractor shall always assist EIL/Owner to achieve the targets set by them on HSE management during the project implementation.

ii. In addition, the Contractor shall also arrange internal HSE meetings chaired by his top most executive at site on fortnightly basis and maintain records. Such internal HSE meetings shall essentially be attended by field engineers / supervisors including safety personnel of the Contractor and its associates. Records of such internal HSE meetings shall be maintained by the Contractor for review by EIL/Owner or for any HSE Audits.

iii. Agenda of internal HSE meeting should broadly cover: -

a) Confirmation of record notes /minutes of previous meeting
b) Discussion on outstanding subjects of previous points / subjects, if any
c) Incidents / Accidents (of all types) at project site, if any
d) Current topics related to site activities / subjects of discussion
e) House keeping
f) Behavioral Safety
g) Information / views / deliberations of members / site sub-contractors
h) Report from Owner / Client
i) Status of Safety awareness, Induction programs & Training programs

The time frame for such HSE meeting shall be religiously maintained by one and all.

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3.1.12 Intoxicating drinks & drugs and smoking

a) The Contractor shall ensure that his staff members & workers (permanent as well casual) shall not be in a state of intoxication during working hours and shall abide by any law relating to consumption & possession of intoxicating drinks or drugs in force.

b) The Contractor shall not allow any workman to commence any work at any locations of project activity who is/are influenced / effected with the intake of alcohol, drugs or any other intoxicating items being consumed prior to start of work or working day.

c) Awareness about local laws on this issue shall form part of the Induction Training and compulsory work-site discipline.

d) The Contractor shall ensure that all personnel working for him comply with "No-Smoking" requirements of the Owner as notified from time to time. Cigarettes, lighters, auto ignition tools or appliances as well as intoxicating drugs, dry tobacco powder, etc. shall not be allowed inside the project / plant complex.

e) Smoking shall be permitted only inside smoking booths, if any, exclusively designated & authorized by the Owner/EIL.

3.1.13 Penalty

The Contractor shall adhere consistently to all provisions of HSE requirements. In case of non-compliances and also for repeated failure in implementation of any of the HSE provisions, EIL/Owner may impose stoppage of work without any cost & time implication to the Owner and/or impose a suitable penalty.

The amount of penalty to be levied against defaulted Contractor shall be up to a cumulative limit of

2.0% (Two percent) of the contract value for Item Rate or Composite contracts with an overall ceiling of 1,00,00,000(Rupees One Crore).

0.5% (Zero decimal five percent) of the contract value for LSTK, OBE, EPC,BOO/BOOT, EPCC or Package contracts with an overall ceiling of 10,00,00,000(Rupees Ten Crores.)

This penalty shall be in addition to all other penalties specified elsewhere in the contract. The decision of imposing stop-work-instruction and imposition of penalty shall rest with EIL/Owner. The same shall be binding on the Contractor. Imposition of penalty does not make the Contractor eligible to continue the work in unsafe manner.
The amount of penalty applicable for the Contractor on different types of HSE violations is specified below:

Sl. No.	Violation of HSE Norms	Penalty Amount
1.	For not using personal protective equipment like Helmet, Safety Shoes, and other safety gadgets as applicable as per nature of work.	Rs.500/- per day/Item / Person
2.	Working without Work Permit/Clearance	Rs.20,000/- per occasion
3	Execution of work without deployment of requisite field engineer / supervisor at work spot	Rs.5,000/- per violation per day
4.	Unsafe electrical practices (not installing ELCB, using poor joints of cables, using naked wire without top plug into socket, laying wire/cables on the roads, electrical jobs by incompetent person, etc.)	Rs.10,000/- per item per day

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Sl. No.	Violation of HSE Norms	Penalty Amount
5.	Working at height without full body harness, using non-standard/ rejected scaffolding and not arranging fall protection arrangement as required, like hand-rails, life-lines, Safety Nets etc.	Rs.10,000/- per case per day
6.	Unsafe handling of compressed gas cylinders (No trolley, jubilee clips double gauge regulator, and not keeping cylinders vertical during storage/handling, not using safety cap of cylinder).	Rs.1,000/- per item per day
7.	Use of domestic LPG for cutting purpose / not using flash back arresters on both the hoses/tubes on both ends.	Rs.5,000/-per occasion
8.	No fencing/barricading of excavated areas / trenches.	Rs.5,000/- per occasion
9.	Not providing shoring/strutting/proper slope and not keeping the excavated earth at least 1.5M away from excavated area.	Rs.5,000/-per occasion
10.	Non display of scaffold tags, caution boards on erected scaffolds.	Rs.1,000/- per occasion per day
11.	Traffic rules violations like over speeding of vehicles, rash driving, talking on mobile phones during vehicle driving, wrong parking, not using seat belts, vehicles not fitted with reverse horn / warning alarms / flicker lamps during foggy weather.	Rs.3,000/-per occasion per day
12.	Absence of Contractor's RCM/SIC or his nominated representative (prior approval must be taken for each meeting for nomination) from site HSE meetings whenever called by EIL/Owner& failure to nominate his immediate deputy for such HSE meetings.	Rs.10,000/- per meeting
13.	Failure to maintain HSE records by Contractor Safety personnel, in line with approved HSE Plan/Procedures/Contract specifications.	Rs.10,000/- per month
14.	Failure to conduct daily site safety inspection (by Contractor's Site Engineer &safety officer), internal HSE meeting, internal HSE Awareness/Motivation Program and Site HSE Training at predefined frequencies (as approved in HSE Plan).	Rs.10,000/- per occasion
15.	Failure to fill online/submit the monthly HSE report by 5th of subsequent month to Engineer-in-Charge/ Owner	Rs10,000/-per occasion and Rs.1,000/-per day of further delay
16.	Poor House Keeping	Rs.5,000 /- per occasion per subject
17.	Failure to report &follow-up accident (including Near Miss) reporting system within specific time-frame.	Rs.20,000/- per occasion
18.	Degradation of environment (not confining toxic spills, spilling oil/lubricants onto ground)	Rs.10,000/- per occasion

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Sl. No.	Violation of HSE Norms	Penalty Amount
19.	Not medically examining the workers before allowing them to work at height / to work in confined space / to work in shot-blasting / to work for painting / to work in bitumen or asphalt works, not providing ear muffs while allowing them to work in noise polluted areas, made them to work in air polluted areas without respiratory protective devices, etc.	Rs.5,000/- per occasion per worker
20.	Violation of any other safety condition as per job HSE plan / work permit and HSE conditions of contract (e.g.using crowbar on cable trenches, improper welding booth, not keeping fire extinguisher ready at hot work site, unsafe rigging practices, non-availability of First-Aid box at site, not providing dead man handle switch for blasting, whiplash arrestor for the compressor line, not using hood with respiratory devices by blaster for shot//grit blasting, etc.)	Rs.5,000/- per occasion
21.	Penalty for non-deployment of ambulance in case of man-power more than 500 or not providing dedicated emergency vehicle in case of man-power less than 500.	Rs.3,000 per day
22.	Failure to carry-out Safety audit in time (internal & external),close-out of identified shortfalls of Observations of Safety Aspects(OSA),etc.	Rs.20,000/- per occasion (for internal audit &OSA). Rs.30,000/-per occasion for external audit
23.	Carrying out sand blasting instead of grit/shot blasting	Rs.50,000/- per day
24.	Failure to deploy adequately qualified and competent Safety Officer	Rs.10,000/- per day per Officer
25.	Utilization of Hydraulic Mobile Crane /back-hoe loader for material shifting or any other unauthorized /unsafe lifting works	Rs.25,000/- per occasion
26.	Any Fatal Accident	Rs.10,00,000/-per fatality
27.	Any violation not covered above	To be decided by EIL/Owner.

Note: Penalty amount deducted from the contractor shall be utilized by owner/EIC for the promotion of the safety during the currency of the project.

The Contractor shall make his field engineers/supervisors fully aware of the fact that they keep track with the site workmen for their behavior and compliance of various HSE requirements. Safety lapses / defects of project construction site shall be attributable to the concerned job supervisor / engineer of the Contractor, (who remains directly responsible for safely executing field works). For repeated HSE violations, concerned job supervisor / engineer shall be reprimanded or appropriate action, as deemed fit, shall be initiated (with information to EIL & Owner) by the concerned Contractor.

Contractor shall initiate verbal warning shall be given to the worker/employee during his first HSE violation. A written warning shall be issued on second violation and specific training shall be arranged / provided by the Contractor to enhance HSE awareness/skill including feedback on the mistakes/ flaws. Any further violation of HSE stipulations by the erring individuals shall call

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for his forthright debar from the specific construction site. A record of warnings for each worker/employee shall be maintained by the Contractor, like by punching their cards / Gate passes or by displaying their names at the Project entry gate. Warnings, penalizations, appreciations etc. shall be discussed in HSE Committee meetings by site Head of the Contractor.

3.1.14 **Accident/ Incident investigation**

All accidents/incidents shall be informed to EIL/Owner at least telephonically by Contractor immediately and in writing within 24 hours on Format No. HSE-2 as applicable, by Contractor. Thereafter, a Supplementary Accident/Incident investigation Report on Format No. HSE-3 shall be submitted to EIL/Owner within 72 hours. Near Miss incident(s), Dangerous accidents/incident shall also be reported on Format No. HSE-4 within24 hours. The accident/ incident shall be investigated by a team of Contractor's senior Site personnel (involving Site-in-Charge or at least by his deputy) for establishing root-cause and recommending corrective & preventive actions. Findings shall be documented and suitable actions taken to avoid recurrences shall be communicated to EIL/Owner. Owner/EIL shall have the liberty to independently investigate such occurrences and the Contractor shall extend all necessary help and cooperation in this regard. EIL/Owner shall have the right to share the content of this report with the outside world.

3.2 House Keeping

The Contractor shall ensure that a high degree of housekeeping is maintained and shall ensure inter-alia; the followings:

a) All surplus earth and debris are removed/disposed-off from the working areas to designated location(s).

b) Unused/surplus cables, steel items and steel scrap lying scattered at different places within the working areas are removed to identify location(s).

c) All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from work place to identified location(s).

d) Roads shall be kept clear and materials like pipes, steel, sand, boulders, concrete, chips and bricks etc. shall not be allowed on the roads to obstruct free movement of men & machineries.

e) Fabricated steel structural, pipes & piping materials shall be stacked properly.

f) Water logging on roads shall not be allowed.

g) No parking of trucks/trolleys, cranes and trailers etc. shall be allowed on roads, which may obstruct the traffic movement.

h) Utmost care shall be taken to ensure over all cleanliness and proper upkeep of the working areas.

i) Protective measures to be ensured with projected rebar by suitable means.

j) Trucks carrying sand, earth and pulverized materials etc. shall be covered while moving within the plant area/ or these materials shall be transported with top surface wet.

k) The contractor shall ensure that the atmosphere in plant area and on roads is free from particulate matter like dust, sand, etc. by keeping the top surface wet for ease in breathing.

l) At least two exits for any unit area shall be assured at all times – same arrangement is preferable for digging pits/ trench excavation/ elevated work platforms/ confined spaces etc.

m) Welding cables and the power cable must be segregated and properly stored and used. The same shall be laid away from the area of movement and shall be free from obstruction.

n) Upkeep/cleaning of site to be carried out on regular basis by the contractor. Contractor shall earmark the area for waste/scrap disposal and ensure that all waste/scrap arising out of the day's work is properly disposed to the earmarked area.

o) Hazardous waste shall be segregated and shall be kept separately at designated place.

p) Contractor shall present the status of housekeeping in HSE meeting.

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The Contractor shall carry-out regular checks (minimum one per fortnight) as per format No. HSE-11 for maintaining high standard of housekeeping and maintain records for the same. The Contractor shall provide supervisor for housekeeping exclusively for management of day-to-day housekeeping activities.

3.3 HSE Measures

3.3.1 Construction Hazards

The Contractor shall ensure identification of all Occupational Health, Safety & Environmental hazards in the type of work he is going to undertake and enlist mitigation measures. Contractor shall carry out HIRAC specifically for high risk jobs/critical jobs like

a) Working at height (+2.0 Mts height) for cold (incl. colour washing, painting, insulation etc.) & hot works.
b) Work in confined space,
c) Deep excavations &trench cutting (depth > 2.0 mts.)
d) Operation & Maintenance of Batching Plant.
e) Shuttering / concreting (in single or multiple pour) for columns, parapets & roofs.
f) Erection & maintenance of Tower Crane.
g) Erection of structural steel members / roof-trusses / pipes at height more than 2.0 Mts. with or without crane.
h) Erection of pipes (full length or fabricated) at height more than 2.0 Mts. height with Crane of 100T capacity.
i) All lifts using 100T Crane plus mechanical pulling.
j) All lifts using two cranes in unison (Tandem Lifting).
k) Any lift exceeding 80% capacity of the lifting equipment's (Hydraulic Mobile Crane, crane etc.).
l) Laying of pipes (isolated or fabricated) in deep narrow trenches – manually or mechanically.
m) Maintenance of crane / extension or reduction of crane-boom on roads or in yards.
n) Erection of any item at >2.0 Mts. height using 100T crane or of higher capacity
o) Hydrostatic test of pipes, vessels & columns and water-flushing.
p) Radiography jobs (in-plant & open field)
q) Work in Live Electrical installations / circuits
r) Handling of explosives &Blasting operations
s) Demolishing/ dismantling activities
t) Welding/ gas cutting jobs at height (+2.0 Mts.)
u) Lifting/placing roof-girders at height(+2.0 Mts.)
v) Lifting & laying of metallic / non-metallic sheet over roof/structures.
w) Lifting of pipes, gratings, equipment's/vessels at heights (+2.0 Mts.) with & without using cranes
x) Calibration of equipment, instruments and functional tests at yards / work-sites.
y) Operability test of Pump, Motors (after coupling) & Compressors.
z) Cold or Hot works inside Confined Space.
aa) Transportation & shifting of ODC consignments into project areas.
bb) Working in "Charged/Live" elect. Panels
cc) Stress Relieving works (Electrically or by Gas-burners).
dd) Pneumatic Tests
ee) Card board blasting
ff) Grit Blasting activity
gg) Catalyst loading/unloading
hh) Erection/dismantling of scaffolding
ii) Chemical cleaning

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The necessary HSE measures devised shall be put in place, prior to start of an activity &also shall be maintained during the course of works, by the Contractor. Copies of such HIRAC shall be kept available at work sites by the Contractor to enable all concerned carrying out checks / verification.

A list of typical construction hazards along with their effects & preventive measures is given in **Appendix-E.**

3.3.2 Accessibility

h) The Contractor shall provide safe means of access(in sufficient numbers)& efficient exit to any working place including provisions of suitable and sufficient scaffolding at various stages during all operations of the work for the safety of his workmen and EIL/Owner.

i) The Contractor shall implement use of all measures including use of "life line", "fall-arresters", "retractable fall arresters", "safety nets" etc. during the course of using all safe accesses& exits, so that in no case any individual remains at risk of slip & fall during their travel.

j) A ladder or step- ladder must have a level and firm footing, in case of use of fixed ladders, sufficient foot hold and hand hold to be provided.

k) The access to operating plant / project complex shall be strictly regulated. Any person or vehicle entering such complex shall undergo identification check, as per the procedures in force / requirement of EIL/Owner.

l) Accessibility to 'confined space' shall be governed by specific system / regulation, as established at project site.

3.3.3 Personal Protective Equipment (PPEs)

a) The Contractor workmen shall be permitted entry inside the project premises only with proper PPEs.

b) The Contractor shall ensure that all their staff, workers and visitors including their sub-contractor(s) have been issued (records to be kept) & wear appropriate PPEs like nape strap type safety helmets preferably with head &sweat band with ¾" cotton chin strap (made of industrial HDPE), High ankle safety shoes with steel toe cap and antiskid sole, Coverall, full body harness (CE marked and conforming to EN361), protective goggles, gloves, ear muffs, respiratory protective devices, etc. All these gadgets shall conform to applicable IS Specifications/CE or other applicable international standards. The Contractor shall implement a regular regime of inspecting physical conditions of the PPEs being issued / used by the workmen of their own & also its sub-agencies and the damaged / unserviceable PPEs shall be replaced forthwith.

c) Owner/EIL may issue a comprehensive color scheme for helmets to be used by various agencies. The Contractor shall follow the scheme issued by the owner/EIL and shall choose colour other than white (for Owner) or blue (for EIL). All HSE personnel shall preferably wear dark green band on their helmet or green color safety helmet so that workmen can approach them for guidance during emergencies.HSE personnel shall preferably wear such dresses with fluorescent stripes, which are noticeable during night, when light falls on them.

d) Florescent jackets with respective company logo to be worn by the contractor workmen with different color coding for categories like supervisor and workmen.

e) Workers required using or handling alkalies, acid or other similar corrosive substance at site shall be provided with appropriate protective equipment, in accordance with MSDS.

f) For shot blasting, the usage of protective face shield and helmets, gauntlet and protective clothing is mandatory. Such protective clothing should conform relevant IS Specification.

g) For off-shore jobs/contracts, contractor shall provide PPEs (new) of all types to EIL & Owner's personnel, at his (contractor's) cost. All personnel shall wear life jacket at all time.

h) An indicative list of HSE standards/codes is given under **Appendix-A**.

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i) Contractor shall ensure procurement & usage of following safety equipment's/ accessories (conforming to applicable IS mark / CE standard) by their staff, workmen & visitors including their subcontractors all through the span of project construction / pre-commissioning/ Commissioning:-

i. PPEs (Helmet with company name/logo, Safety Goggles, Coverall, Ear-muff, Face Shield, Hand Gloves, High Ankle Safety Shoes, Gum Boot etc.)
ii. Barricading tape / warning signs
iii. Rechargeable Safety torch (flame-proof)
iv. Safety nets (with tie-chords)
v. Fall arresters
vi. Emergency Man-basket/rescue kit for height works
vii. Portable ladders (varying lengths)
viii. Life-lines (steel wire-rope, dia. not less than 8.0 mm)
ix. Full body double lanyard Safety harness with Rebar/ladder hook or scaffolding hook.
x. Lanyard
xi. Karabiner
xii. Retractable fall arresters (various length)
xiii. Portable fire extinguishers (DCP type) – 5 kg&10 kg capacity
xiv. Portable Multi Gas detector
xv. Sound level meter
xvi. Digital lux meter
xvii. Fire hoses & flow nozzles
xviii. Fire blankets/ Fire retardant cloth (with eyelets)
xix. Flame retardant/Flame resistant coverall-based on hazard identification & risk assessment, if required.

3.3.4 **Working at height**

a) The Contractor shall issue permit for working (PFW) at height after verifying and certifying the checkpoints as specified in the attached permit (Format No. HSE-6). He shall also undertake to ensure compliance to the conditions of the permit during the currency of the permit including adherence of personal protective equipment's. Contractor's Safety Officer shall verify compliance status of the items of permit document after implementation of action is completed by Contractor's execution / field engineers at work site. HIRAC for specific works at height duly commented by EIL/Owner, shall be kept attached with particular Permit for Work (PFW) at site for ready reference & follow-up.

b) Such PFW shall be initially issued for one single shift or expected duration of normal work and extended further for balance duration, if required. EIL/Owner can devise block-permit system at any specific area, in consultation with project specific HSE Committee to specify the time-period of validity of such PFW or its renewal. This permit shall be applicable in areas where specific clearance from Owner's operation Deptt./Safety Deptt. is not required. EIL / Owner's field Engineers/Safety Officers/Area Coordinators may verify and counter sign this permit (as an evidence of verification) during the execution of the job.

c) All personnel shall be medically examined & certified by registered doctor, confirming their 'medical fitness(Vertigo or epilepsy must be covered under test report)for working at height. Contractor shall develop the model for conducting vertigo test. The fitness examination shall be done once in six months. Sticker for "PASS FOR HEIGHT WORK" shall be pasted on the safety helmet of the site personnel.

d) In case work is undertaken without taking sufficient precautions as given in the permit, EIL/Owner Engineers may exercise their authority to cancel such permit and stop the work till satisfactory compliance/rectification is arranged made. Contractors are expected to maintain a register for issuance of permit and extensions thereof including preserving the

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used permits for verification during audits etc.

e) The Contractor shall arrange (at his cost) and ensure use of Fall Arrester Systems by his workers. Fall arresters are to be used while climbing/descending tall structures or vessels / columns etc. These arresters should lock automatically against the anchorage line, restricting free fall of the user. The device is to be provided with a double security opening system to ensure safe attachment or release of the user at any point of rope. In order to avoid shock, the system should be capable of keeping the person in vertical position in case of a fall. All the fall arrest systems should be cleaned after use and stored in a clean &dry area. Defective Safety Harness, lanyards & life line must be discarded from workplace and record to be maintained.

f) The Contractor shall ensure that Full body harnesses with double lanyards conforming EN361 and having authorized CE marking is used by all personnel while working at height. The lanyards and life lines should have enough tensile strength to take the load of the worker in case of a fall. One end of the lanyard shall be firmly tied with the harnesses and the other end with life line. The harness should be capable of keeping the workman vertical in case of a fall, enabling him to rescue himself.

g) The Contractor shall provide Roof Top Walk Ladders for carrying out activities on sloping roofs in order to reduce the chances of slippages and falls.

h) The Contractor shall ensure that a proper Safety Net System is used wherever the hazard of fall from height is present. The safety net, preferably a knotted one with mesh ropes conforming to IS 5175/ ISO 1140 shall have a border rope & tie cord of minimum 12mm dia. The Safety Net shall be located not more than 6.0 meters below the working surface extending on either side upto. sufficient margin to arrest fall of persons working at different heights.

i) In case of accidental fall of person on such Safety Net, the bottom most portion of Safety Net should not touch any structure, object or ground.

j) Grade separators shall be provided in Pipe-rack/Tech-structures to arrest falling objects like welding spatters, welding rods, nuts, bolts, tools etc. and to facilitate U/G and A/G works simultaneously.

k) Beam Clamps may be used for construction of localized temporary working platforms sheds for welding booths etc. at height in all types of steel structure due to faster installation and requirement of less scaffolding materials.

l) Hanging Platform, manufactured by Standard HSE equipment vendors must be encouraged for painting of Buildings etc.

m) All the tools used at height (like spanner, screw driver etc.) shall be provided with securing arrangement like back-pack/waist pouch to prevent accidental slippage from worker hand.

n) The Contractor shall install temporary lightening arrester in tall structures during construction to save human life and to avoid damage to equipment's& machineries. During the possibility of a thunderstorm, all the work at height where a person can be exposed to lightning shall be stopped.

o) To the extent possible use Roller arrangement to shift overhead pipes from one end to other in Pipe Racks Area.

p) Providing of steel scaffold stair tower system with landings at regular intervals as and when required for height work.

q) The Contractor shall ensure positive isolation while working at different levels like in the pipe rack areas. The working platforms with toe boards & hand rails shall be sufficiently strong & shall have sufficient space to hold the workmen and tools& tackles including the equipment's required for executing the job. Such working platforms shall have mid-rails, to enable people work safely in sitting posture.

3.3.5 Scaffoldings& Barricading

a) Suitable steel scaffoldings only shall be provided to workmen for all works that cannot be safely done from the ground or from solid construction except such short period work that

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can be safely done using ladders or certified (by 3rd party competent person) man-basket. When a ladder is used, an extra workman shall always be engaged for holding the ladder. The ladder shall be inspected before use for cracked or split stiles, missing, broken, loose or damaged rungs & splinters. The ladder shall be of adequate length to enable it to extend to at least 1.0m above the landing place or working point. Metallic ladders shall be only used as access.

b) The Contractor shall ensure that the scaffolds used during construction activities shall be strong enough to take the designed load. Main Contractor shall always furnish duly approved construction-design details of scaffold &SWL (from competent designers) free of charge, before they are being installed/ constructed at site. Owner/EIL reserves the right to ask the Contractor to submit certification and or design calculations from his Head Office/ Design/Engineering expert regarding load carrying capacity of the scaffoldings. All steel tubing, couplers and fittings used for scaffolding shall conform to IS 3696 or an acceptable equivalent. Only metallic scaffold boards shall be allowed to use. Steel tubes shall be free from cracks, splits. Surface flaws & other defects. All couplers & fittings shall be properly oiled and maintained. Nuts shall have a free running fit on their bolts. Bolts with worn or damaged thread shall be replaced.

c) All scaffolds shall be inspected by a competent Scaffolding Inspector (person with scaffolding related experience in construction field and having a training of scaffolding supervisor from a institute/agency like National Safety Council etc.). He shall paste a GREEN tag (duly signed by competent Scaffolding Inspector) on each scaffold found safe and a RED tag (duly signed by competent Scaffolding Inspector) on each scaffold found unsafe. Scaffolds with GREEN tag only shall be permitted to be used and Scaffolds with RED ones shall immediately be made inaccessible. Work being found continuing on scaffolds with RED tag shall be considered unauthorized work by Contractor and may invite penalization from EIL/Owner. For every 120-125 m^2 /m^3 area / volume or its parts thereof minimum one TAG shall be provided.

d) The Contractor shall ensure positive barricading (indicative as well as protective) of the excavated, radiography, heavy lift, high pressure hydrostatic & pneumatic testing and other such areas. Sufficient warning signs shall be displayed along the barricading areas.

e) Scaffolding shall be constructed using foot seals or base plates only. Base plates shall be used below each standard on surface .Sole plate of timber shall be used beneath the base plate to achieve greater load distribution.

3.3.6 **Electrical installations**

a) All electrical installations/ connections shall be carried out as per the provisions of latest revision of following codes/standards, in addition to the requirements of Statutory Authorities and IE/applicable international rules& regulations:

- OISD STD 173 : Fire prevention & protection system for electrical installations
- SP 30 (BIS) : National Electric Code

b) All electrical installations shall be approved by the concerned statutory authorities.

c) All temporary electrical installations / facilities shall be regularly checked by the licensed/competent electricians of the Contractor and appropriate records shall be maintained in format no: HSE-12" Inspection of temporary electrical booth/installation at project construction site". Such inspection records are to be made available to EIL/Owner, whenever asked for.

3.3.6.1 The Contractor shall meet the following requirements:

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a. Shall make Single Line Diagram (SLD) for providing connection to each equipment's & machinery and the same (duly approved by EIL/Owner) shall be pasted on the front face of DBs (distribution boards) or JBs (Junction boxes) at every site.(A typical Switch Board Sketch is attached as Appendix -G)

b. Ensure that electrical systems and equipment including tools & tackles used during construction phase are properly selected, installed, used and maintained as per provisions of the latest revision of the Indian Electrical/ applicable international regulations.

c. Shall deploy qualified & licensed electricians for proper & safe installation and for regular inspection of construction power distribution system/points including their earthing. A copy of the license shall be submitted to EIL / Owner for records. Availability of at least one competent (ITI qualified) / licensed electrician (by State Elec. authorities) shall be ensured at site round the clock to attend to the normal/emergency jobs.

d. All switchboards / welding machines shall be kept in well-ventilated & covered shed/ with rain shed protection. The shed shall be elevated from the existing ground level to avoid water logging inside the shed. Installation of electrical switch board must be done taking care of the prevention of shock and safety of machine.

e. No flammable materials shall be used for constructing the shed. Also flammable materials shall not be stored in and around electrical equipment / switchboard. Adequate clearances and operational space shall be provided around the equipment.

f. Fire extinguishers and insulating mats shall be provided in all power distribution centers.

g. Temporary electrical equipment shall not be employed in hazardous area without obtaining safety permit.

h. Proper housekeeping shall be done around the electrical installations.

i. All temporary installations shall be tested before energizing, to ensure proper earthing, bonding, suitability of protection system, adequacy of feeders/cables etc.

j. All welders shall use hand gloves irrespective of holder voltage.

k. Multilingual (Hindi, English and local language) caution boards, shock treatment charts and instruction plate containing location of isolation point for incoming supply, name & telephone No. of contact person in emergency shall be provided in substations and near all distribution boards / local panels.

l. ELCB tester /test meter shall be used for testing the ELCBs operation. ELCBs testing shall be carried out by using ELCB tester on monthly basis but in specific cases like heavy rain as decided by owner/EIC. Record of the testing shall be maintained.

m. Regular inspection of all installations at least once in a month. (**Ref. Format HSE-12**).

3.3.6.2 The following features shall also be ensured for all electrical installations during construction phase by the contractor:

a. Each installation shall have a main switch with a protective device, installed in an enclosure adjacent to the metering point. The operating height of the main switch shall not exceed 1.5 M. The main switch shall be connected to the point of supply by means of armoured cable.

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b. The outgoing feeders shall be double or triple pole switches with fuses / MCBs. Loads in a three phase circuit shall be balanced as far as possible and load on neutral should not exceed 20% of load in the phase.

c. The installation shall be adequately protected against overload, short circuit and earth leakage by the use of suitable protective devices. Fuses wherever used shall be HRC type. Use of rewirable fuses shall be strictly prohibited. ELCB/RCCB (Residual Current Circuit Breaker) must be fitted with all Electrical installation. The earth leakage devices shall have an operating current not exceeding 30 mA.

d. All connections to the hand tools / welding receptacles shall be taken through proper switches, sockets and plugs.

e. All single phase sockets shall be minimum 3 pin type only. All unused sockets shall be provided with socket caps.

f. Only 3 core (P+N+E) overall sheathed flexible cables with minimum conductor size of 1.5 mm^2 copper shall be used for all single phase hand tools.

g. Only metallic distribution boxes with double earthing shall be used at site. No wooden boxes shall be used.

h. All power cables shall be terminated with compression type cable glands. Tinned copper lugs shall be used for multi-strand wires / cables.

i. Cables shall be free from any insulation damage.

j. Minimum depth of cable trench shall be 750 mm for MV & control cables and 900 mm for HV cables. These cables shall be laid over a sand layer and covered with sand, brick & soil for ensuring mechanical protection. Cables shall not be laid in waterlogged area as far as practicable. Cable route markers shall be provided at every 25 M of buried trench route.

When laid above ground, cables shall be properly cleated or supported on rigid poles of atleast 2.1 M high. Minimum head clearance of 6 meters shall be provided at road crossings.

k. Underground road crossings for cables shall be avoided to the extent feasible. In any case no underground power cable shall be allowed to cross the roads without pipe sleeve.

l. All cable joints shall be done with proper jointing kit. No taped/temporary joints shall be used.

m. An independent earthing facility should preferably be established within the temporary installation premises. All appliances and equipment shall be adequately earthed. In case of armored cables, the armour shall be bonded to the earthing system. IS: 3043 Code for earthing practices shall be followed at project site.

n. All cables(green colour) and wire rope used for earth connections shall be terminated through tinned copper lugs.

o. In case of local earthing, earth electrodes shall be buried near the supply point and earth continuity wire shall be connected to local earth plate for further distribution to various appliances. All insulated wires for earth connection shall have insulation of green colour. Periodical check tests of all electrodes should be carried out and record shall be maintained of such checks.

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p. Separate core shall be provided for neutral. Earth / Structures shall not be used as a neutral in any case.

q. ON/OFF position of all switches shall be clearly designated / painted for easy isolation in emergency.

3.3.7 Welding/ Grinding/Gas cutting

a) Contractor shall ensure that flash back arrestors conforming to BS:6158 or equivalent are installed on all gas cylinders as well as at the torch end of the gas hose, while in use.

b) All cylinders shall be mounted on trolleys and provided with a closing key. Empty & filled-up gas cylinders shall be stored separately with TAG, protecting them from direct sun or rain. Minimum 2 nos. of Portable DCP type fire extinguishers (10 kg) shall be maintained at the gas cylinder stores. Stacking & storing of compressed gas cylinders shall be arranged away from DG set, hot works, Elect. Panels / Elec. boards, etc.

c) The burner and the hose placed downstream of pressure reducer shall be equipped with Flash Back Arrester/Non Return Valve device.

d) The hoses for acetylene and oxygen cylinders must be of different colours. Their connections to cylinders and burners shall be made with a safety collar.

e) At end of work, the cylinders in use shall be closed and hoses depressurized.

f) Cutting of metals using gases, other than oxygen &acetylene, shall require written concurrence from Owner.

g) Grinding activity shall not be carried out in confined spaces without a valid work permit.

h) All grinding/cutting machines shall be guarded and fitted with Dead-Man switch and this shall not be bypassed any time.

i) All welding/grinding machines shall have effective earthing at least at distinctly isolated two points.

j) In order to help maintain good housekeeping, and to reduce fire hazard, live electrode bits shall be contained safely and shall not be thrown directly on the ground.

k) The hoses of Acetylene and Oxygen shall be kept free from entanglement & away from common pathways / walkways and preferably be hanged overhead in such a manner which can avoid contact with cranes, Hydraulic Mobile Crane or other mobile construction machinery.

l) Hot spatters shall be contained / restricted appropriately (by making use of effective fire-retardant cloth/fabric) and their flying-off as well as chance of contact with near-by flammable materials shall be stopped. The Fire retardant blanket shall be woven from ceramic yarn with eyelets.

m) The Contractor shall arrange adequate systems & practices for accumulation / collection of metal & other scraps and remnant electrodes and their safe disposal at regular interval so as to maintain the fabrication and other areas satisfactorily clean & tidy.

n) All gas cylinders must have a cylinder cap on at all times when not in use.

3.3.8 Ergonomics and tools & tackles

a) The Contractor shall assign to his workmen, tasks commensurate with their qualification, experience and state of health. Competency of the crane operator to be thoroughly checked prior to engaging in crane operation.

b) All lifting tools, tackles, equipment, trailers, trucks/dumpers, accessories including cranes shall be tested periodically by statutory/competent authority for their condition and load carrying capacity. Valid test & fitness certificates from the applicable authority shall be submitted to Owner/EIL for their review/acceptance before the lifting tools, tackles,

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equipment, trailers, trucks/dumpers, accessories and cranes are used. Third party inspection certificate is mandatory for all lifting tools & tackles before put into use.

c) Load testing of Cranes by competent person must be made mandatory after each modification/alteration of crane configuration/change in boom length. All heavy equipment's including cranes must be maintained in good condition &record of such maintenance shall be maintained. Routine preventive maintenance of the crane to be carried out& record to be maintained for such preventive maintenance. Healthiness of the crane to be checked by Crane Expert on regular basis as per manufacturer guidelines.

d) HIRAC/JSA for assembly/dismantling activity of the crane to be submitted for approval of EIC.

e) No one should stand/work below the mast & boom of the crane. Mast of the crane should not be used for unintended lifts.

f) Mast of the crane to be kept in right position during dismantling activity of the crane.

g) Log book of all crane to be maintained.

h) Only authorized person shall be allowed to give signal to the operator.

i) Lifting/Loading/Unloading activities shall be carried out by the trained riggers under supervision of rigging Foreman.

j) Prior to marching/movement of the crane, obstructions free access/route to be ensured.

k) Skilled Technician to be engaged for AC gas checking and refilling of refrigerant and should follow the safe operating procedure for cranes.

l) Manufacturer's instructions to be followed without any deviation.

m) The contractor shall not be allowed to use defective equipment or tools not adhering to safety norms.

n) Adequate capacity of Chain pulley blocks with valid TPI certificate to be used for lifting/lowering/dragging/erection of piping material .

o) Colour coding system for lifting tools & tackles shall be followed on quarterly basis for a particular colour as mentioned below:

Period	Colour Code
January, February, March	Blue
April,May, June	Yellow
July, August, September	Green
October, November, December	Orange
For Quarantine (Unsafe Tools & Tackles)	Red

Contractor shall arrange non-sparking tools for project construction works in operating plant areas / hydrocarbon prone areas.

i. Wherever required the Contractor shall make use of Elevated Work Platforms (EWP) or Aerial Work Platforms (mobile or stationary) to avoid ergonomical risks and workmen shall be debarred to board such elevated platform during the course of their shifting / transportation.

ii. Contractor shall ensure installation of Safe Load Indicator (SLI) on all cranes (while in use) to minimize overloading risk. SLI shall have capability to continuously monitor and display the load on the hook, and automatically compare it with the rated crane capacity at the operating condition of the crane. The system shall also provide visual and audible warnings at set capacity levels to alert the operator in case of violations.

iii. The contractor shall be responsible for safe operations of different equipments mobilized and used by him at the workplace like transport vehicles, Tower Crane, engines, cranes, mobile ladders, scaffoldings, work tools, etc. Strictly avoid standing close to Hydraulic Mobile Crane/vehicles tyres during operation.

iv. The contractor shall deploy cranes in good working condition of maximum allowable years of service from the year of manufacture as specified below: -

20 years for cranes of 50 MT & below capacity,25 years for 51 MT to 100 MT,30 years for cranes above 101 MT.

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v. In general Man basket shall not be lifted by Hydraulic Mobile Crane. Generally Crane shall be used for lifting the man basket.

vi. Tower Crane, Crane, Hydraulic Mobile Crane or equivalent, Hydraulic Rig &Boom Lift shall be inspected on fortnightly basis as per Format No. HSE-20, HSE-21, HSE-22, HSE-23 & HSE-24.

vii. The Contractor shall arrange periodical training for the operators of Hydraulic Mobile Crane, crane, excavator, mobile machinery, Tower Crane, etc. at site by utilizing services from renowned manufacturers.

viii. Hydraulic Mobile Crane or equivalent having steering control mechanism shall be permitted at construction site only for the purpose of loading/unloading. However, continuous rigger availability during marching of hydraulic crane at site shall be ensured by contractor.

3.3.9 Occupational Health

a) The contractor shall identify all operations that can adversely affect the health of its workers and issue & implement mitigation measures.

b) For surface cleaning operations, sand blasting shall not be permitted even if not explicitly stated elsewhere in the contract.

c) To eliminate radiation hazard, Tungsten electrodes used for Gas Tungsten Arc Welding shall not contain Thorium.

d) Appropriate respiratory protective devices(hood with respiratory devices) shall be used to protect workmen from inhalation of air borne contaminants like silica, asbestos, gases, fumes, etc.

e) Workmen shall be made aware of correct methods for lifting, carrying, pushing & pulling of heavy loads. Wherever possible, manual handling shall be replaced by mechanical lifting equipment's.

f) Fuelling of construction equipments/Diesel Generator set shall be carried out by hand operated pump.

g) In view of the congested working environment and associated hazards, deployment of manpower/machineries shall be in staggered manner keeping adequate safe distance between two adjacent work spot.

h) For jobs like drilling/demolishing/dismantling/steam blowing/cardboard blasting etc. where noise pollution exceeds the specified limit of 85decibels, ear muffs shall be provided to the workers. The Noise level monitoring record shall be maintained.

i) To avoid work related upper limb disorders (WRULD) and backaches, Display Screen Equipments' workplace stations shall be carefully designed & used with proper sitting postures. Power driven hand-held tools shall be maintained in good working condition to minimize their vibrating effects and personnel using these tools shall be taught how to operate them safely & how to maintain good blood circulation in hands.

j) The Contractor shall arrange health check-up(by registered medical practitioner) for all the workers at the time of induction. Health check may have to be repeated if the nature of duty assigned to him is changed necessitating health check or doubt arises about his wellness. EIL/Owner reserves the right to ask the contractor to submit medical test reports. Regular health check-ups are mandatory for the workers assigned with Welding, Radiography, Blasting, Painting, Heavy Lift and Height (>2m) jobs. All the health check-ups shall be conducted by registered Medical practitioner and records are to be maintained by the Contractor.

k) The Contractor shall arrange Medical Camps at regular intervals at work sites and labor colonies to assess health condition of workers.

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l) The Contractor shall ensure vaccination of all the workers including their families, during the course of entire project span.

3.3.10 Hazardous substances

a) Hazardous, inflammable and/or toxic materials such as solvent coating, thinners, anti-termite solutions, water proofing materials shall be stored in appropriate containers preferably with lids having spillage catchment trays and shall be stored in a good ventilated area. These containers shall be labeled with the name of the materials highlighting the hazards associated with its use and necessary precautions to be taken. Respective MSDS (Material Safety Data Sheet) shall be made available at site &may be referred whenever problem arises.

b) Where contact or exposure of hazardous materials are likely to exceed the specified limit or otherwise have harmful effects, appropriate personal protective Equipment's such as gloves, goggles/face-shields, aprons, chemical resistant clothing, respirator, etc. shall be used.

c) The work place shall be checked prior to start of activities to identify the location, type and condition of any asbestos materials which could be disturbed during the work. In case asbestos material is detected, usage of appropriate PPEs by all personnel shall be ensured and the matter shall be reported immediately to EIL/ Owner.

3.3.11 Slips, trips & falls

a) The contractor shall establish a regular cleaning and basic housekeeping programme that covers all aspects of the workplace to help minimize the risk of slips, trips & falls. The contractor shall take positive measures like keeping the work area tidy, storing waste in suitable containers & harmful items separately, keeping passages, stairways, entrances & exits especially emergency ones clear, cleaning up spillages immediately and replacing damaged carpet/ floor tiles, mats & rugs at once to avoid slips, trips & falls.

b) Grating removal permit system should be implemented during construction phase. So that after permanent gratings are installed on platforms and tech structure floors; removal of any gratings for whatever purpose (including for lifting piping material etc.) is required to be sanctioned by signed permit by HSE officers of both contractor and Engineer-in-charge. The spot where gratings are removed shall be hard-barricaded during course of work. The removed gratings shall be re-installed immediately after completion of work or at the time of cessation of work every day whichever is earlier and the permit shall be closed on daily basis. A register shall be maintained for recording all the grating removal permits and their closure shall be monitored on daily basis.

3.3.12 Radiation exposure

a) All personnel exposed to physical agents such as ionizing &non-ionizing radiation, including ultraviolet rays or similar other physical agents shall be provided with adequate shielding or protection commensurate with the type of exposure involved.

b) For Open Field Radiography works, requirements of Bhabha Atomic Research Centre (BARC)/ Atomic Energy Regulatory Board (AERB) shall be followed.

c) The Contractor shall implement an effective system of control (as described in the AERB regulations) at site for handling radiography-sources & for avoiding its misuse & theft.

d) The contractor shall generate the Format No: HSE-8 "Permit for radiation work" before start of work.

e) In case the radiography work has to be carried out at day time, suitable methodology to be used so that other works, people are not affected.

3.3.13 Explosives/Blasting operations

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a) Blasting operations shall be carried out as per latest Explosive Rules (Indian/ International) with prior permission. The Contractor shall obtain license from Chief Controller of Explosives (CCoE) for collection, transportation, storage of explosives as well as for carrying out blasting operations.

b) The Contractor shall prepare exclusive method statement (in cognizance with statutory requirements)for rock blasting works &diffusing unfired explosives, if any, at project site before carrying out actual task. Nowhere blasting shall be carried out by the Contractor or its agency without the involvement of competent supervisor and licensed blaster.

3.3.14 Demolition/ Dismantling

a) The contractor shall adhere to safe demolishing/ dismantling practices at all stages of work to guard against unsafe working practices.

b) The contractor shall disconnect service lines (power, gas supply, water, etc.)/ make alternate arrangements prior to start of work and restore them, ifrequired as directed by EIL/ Owner at no extra cost.

c) Before carrying out any demolition/dismantling work, the contractor shall take prior approval of EIL/Owner and generate the Format No.HSE-9. For revamp jobs in operating plants where location of underground utilities is not known with certainty, the contractor shall depute an experienced engineer for supervision and shall make adequate arrangements for Fire-fighting& First-Aid during the execution of these activities.

d) The Contractor shall arrange approved HIRAC/ Method Statement for the specific demolition / dismantling task and corresponding action plan commensurate with hazards / risks associated therein. In no case any activity related to demolition / dismantling shall be carried out by the Contractor without engaging own supervision / field engineer.

3.3.15 Road Safety

a) The Contractor shall ensure adequately planned road transport safety management system.

b) The vehicles shall be fitted with reverse warning alarms & flashing lights / fog-lights and usage of seat belts shall be ensured.

c) The Contractor shall also ensure a separate pedestrian route for safety of the workers and comply with all traffic rules & regulations, including maintaining speed limit of 20 KMPH or indicated by owner for all types of vehicles / mobile machinery. The maximum allowable speed shall be adhered to.

d) In case of an alert or emergency, the Contractor must arrange clearance of all the routes, roads, access. The Contractor shall deploy sufficient number of traffic controllers at project site routes / roads/ accesses, to alert reversing movement of vehicles & machinery as well as pedestrians. Experienced drivers/operators with valid driving license (LMV/HMV)shall be allowed to drive/operate the vehicles/equipment's. The Contractor shall maintain copy of PUC,RC and Insurance etc. for all the vehicles/equipment's.

e) Dumpers, Tippers, etc. shall not be allowed to carry workers within the plant area and also to & from the labour colony to & from project sites.

f) Hydraulic Mobile Crane or equivalent)shall only be allowed for handling(loading/unloading) the materials at fabrication/ storage yards and in no case shall be allowed to transport the materials over project / plant roads.

g) The Contractor shall not deploy any such mobile machinery / Equipment's, which do not have competent operator and / or experienced banks-man/signal-man. Such machinery/equipment's shall have effective limit-switches, reverse-alarm, front& rear-end lights etc. and shall be maintained in good working order.

h) The Contractor shall not carry-out maintenance of vehicles / mobile machinery occupying space on project / plant roads and shall always arrange close supervision for such works.

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i) For pipeline jobs, the contractor shall submit a comprehensive plan covering transportation, loading / unloading of pipes, movement of side booms, movement of vehicles on the ROW, etc.

j) Height barrier/Restriction to be provided on both side of the HT lines, if required.

k) Contractor's shall arrange /install visible road signs, diversion boards, caution boards, etc. on project roads for safe movement of men and machinery.

3.3.16 Welfare measures

Contractor shall, at the minimum, ensure the following facilities at work sites:

a) A crèche at site where 10 or more female workers are having children below the age of 6 years.

b) Adequately ventilated / illuminated rooms at labour camps & its hygienic up-keeping.

c) Reasonable canteen facilities at site and in labour camps at appropriate location depending upon site conditions. Contractor shall make use of "industrial" variety of LPG cylinder & satisfactory illumination at the canteens. Necessary arrangement for efficient disposal of wastes from canteens & urinals /toilets shall also be made and regular review shall be made to maintain the ambience satisfactorily hygienic &shall also comply with all applicable statutory requirements.

d) Adequately lighted & ventilated Rest rooms at site (separate for male workers and female workers).

e) Provision for suitable mobile toilets to be made available by Contractor for remote/scattered job locations.

f) Urinals, Toilets, drinking water, washing facilities, adequate lighting at site and labour camps, commensurate with applicable Laws/ Legislation.

g) The contractor shall ensure the test report of drinking water.

h) The contractor at periodic interval shall arrange to prevent mosquito breeding by fumigation/spraying of insecticides at workplace/fabrication yard.

3.3.17 Environment Protection

Contractor shall ensure proper storage and utilization methodology of materials that are detrimental to the environment. Where required, Contractor shall ensure that only the environment friendly materials are selected and emphasize on recycling of waste materials, such as metals, plastics, glass, paper, oil & solvents. The waste that cannot be minimized, reused or recovered shall be stored and disposed of safely. In no way, toxic spills shall be allowed to percolate into the ground. The contractor shall not use the empty areas for dumping the wastes.

The contractor shall ensure availability of stack emission test report of DG set. Monitoring of air quality emission of DG stack shall be carried out on yearly basis. However, air quality emission shall be monitored first time on commissioning of DG Set.

Contractor to submit Environmental Aspect Impact Register detailing the list of activities in his scope, the respective environmental impact and the actions taken to minimize the impact. Environmental Aspect Impact Register to be prepared as per Format HSE-18 and to be updated and maintained till job completion. Environmental Aspect Impact Register of the contractor shall be reviewed by EIL/Owner on half-yearly basis.

The contractor shall strive to conserve energy and water wherever feasible.

The contractor shall ensure dust free environment at workplace by sprinkling water on the ground at frequent intervals. The air quality parameters for dust, poisonous gases, toxic releases,

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harmful radiations, etc. shall be checked by the contractor on daily basis and whenever need arises.

The contractor shall not be allowed to discharge chemicals, oil, silt, sewage, sullage and other waste materials directly into the controlled waters like surface drains, streams, rivers, ponds. A discharge plan suggesting the methods of treating the waste before discharging shall be submitted to EIL/Owner for approval.

For pipeline jobs, top soil shall be stacked separately while making ROW through fields. This fertile soil shall be placed back on top after backfilling.

For offshore construction barges, arrangements shall be made for safe disposal of human, food & other wastes and applicable laws in this regard shall be followed.

3.3.18 Rules & Regulations

All persons deployed at site shall be knowledgeable of and comply with the environmental laws, rules & regulations relating to the hazardous materials, substances and wastes. Contractor shall not dump, release or otherwise discharge or disposes off any such materials without the express authorization of EIL/Owner. An indicative list of Statutory Acts & Rules relating to HSE is given under Appendix-D.

3.3.19 Weather Protection

Contractor shall take appropriate measures to protect workers from severe storms, rain, solar radiations, poisonous gases, dust, etc. by ensuring proper usage of PPEs like Sun glasses, Sun screen lotions, respirators, dust masks, etc. and rearranging/ planning he construction activities to suit the weather conditions. Effective arrangement (without creating inconvenience to project facilities & permanent installations) for protecting workmen from hailstorm, drizzle in the form of temporary shelter shall be made at site.

3.3.20 Communication

All persons deployed at the work site shall have access to effective means of communication so that any untoward incident can be reported immediately and assistance sought by them.

All health & safety information shall be communicated in a simple & clear language easily understood by the local workforce.

For information to all, typical subjects that should be communicated are: -

Inside the company (Top to down)

a. Quality Policy
b. HSE Policy contents
c. Environment Policy
d. HSE Objectives
e. Safety Cardinal Rules
f. HSE Target – reached or missed
g. Praises & Warnings to personnel for HSE Management
h. Safety Walk Through Reports and safety defects / shortfalls (by management)
i. HSE Audit results
j. Revised Statutory Health & Safety provisions, if any
k. H & S publicity
l. Suggestions

Inside the Company (Bottom to up)

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a. Complaints
b. Compliances on safety defects / shortfalls
c. Suggestions
d. Proposals for changes & improvements
e. HSE Reports (including near-miss reports)

3.3.21 Confined Space Entry

The contractor shall generate a work permit (Format No. HSE -7) before entering a confined space. People, who are permitted to enter into confined space, must be medically examined & certified by registered doctor, confirming their 'medical fitness for working in confined space'. All necessary precautions mentioned therein shall be adhered to. An attendant shall be positioned outside a confined space for extending help during an emergency. Effective communication shall be maintained between personnel in confined space and outside by combination of visual/voice or portable radio. Compressed gas cylinders shall not be taken into confine space. Entry Register for confined space to be maintained with the name and time of entry/exit. All appropriate PPEs and air quality parameters shall be checked before entering a confined space. It shall be ensured that the piping of the equipment which has to be opened is pressure- free by checking that blinds are in place, vents are open and volume is drained. Inside confined space works, only electrical facilities / installations of 24V shall be permitted. Contractor shall ensure usage of safe & suitable arrangement of oxygen supply for individual workmen (during the course of work in confined space), if oxygen concentration is found to be less than 19.5% (v/v) there. All persons must be made aware of the risk associated with Nitrogen &all precautionary measures shall be taken when vessel/sphere/pipelines etc. are being purged with nitrogen.
Rescue arrangement must be readily available at workplace to fulfill requirement of the emergency situation.

3.3.22 Heavy Lifts

a) The contractor shall submit detailed rigging study/ plan for EIL/ Owner approval prior to lifting equipment requiring a crane of approx. 100 MT capacity or more due to constraints of its dimensions, location of foundation height, approach & weight.
b) Contractor shall generate the format no. HSE-15 "Permit for heavy lift/critical erection"
c) The Safe Working Load (SWL) and manufacturer's serial numbers shall be clearly marked on the slings and the lifting gears, either by tagging, stamping, engraving or embossing.
d) Prior to actual lifting activities, contractor shall check the validity of the crane inspection certificate issued by statutory/ competent authority. This requirement shall also apply to all rigging equipment's utilized for the job.
e) The contractor shall, at all times, be responsible for all rigging activities.
f) The Contractor shall ensure medical fitness of all workmen who are engaged / involved in erection of equipment's, vessels etc. and such fitness checks shall be carried-out every six months interval with the help of a registered medical practitioner & record shall be maintained
g) Adequate safety measures such as positive barricading, usage of appropriate PPEs, permit to work, etc. shall be taken during all heavy or critical lifts.
h) Ground condition should be suitable to sustain the Ground Bearing Load of the Crane with full load condition.
i) For lifting any material (irrespective of shape, size or volume), at any height, it is always advisable to prepare a Plan of Erection (PoE) taking into consideration hazards & risks associated therein – this can enable people to put their own experiences of various natures & side-by-side establish a practical method for risk-free erection / lifts. The contractor shall

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prepare PoE & shall document the same, when risks are identified as "medium" or "high" and the same shall be approved by its competent / qualified engineer.

3.3.23 Key Performance Indicators

The contractor shall measure an activity in both leading & trailing indicators for statistical and performance measurement. The activities pertaining to key performance indicators are covered in Monthly HSE Report (Format No. HSE-5). The contractor shall try to achieve a statistically fair record and strive for its continual improvement.

Leading Indicators viz:-:

- Number of Safety Inductions carried-out at site (for workmen & staff members)
- Number of HSE inspections carried out
- Number of "Safety Walk Through" carried-out by site-head.
- Number of HSE shortfalls / lapses identified per contractor& closed-out in time.
- Number of Safety Meetings conducted (in-house / with contractors)
- Number of HSE Audits made (internal & external) vis-à-vis non conformances raised
- Number of HSE Awareness / Motivational program conducted by contractors
- Number of HSE Trainings conducted at site for supervisors & workmen
- Study of Near miss case reported
- Encouragements / Awards / Recognitions to workmen, job supervisors & field engineers.
- Suggestions for improvement

Trailing Indicators viz:-:

- Calculation of HSE statistics viz frequency rate, severity rate, LTA free man hours etc.
- Analysis of incidents / accidents (nature, severity, types etc.)
- Study of Incident / Accident with respect to :-
    - Variety
    - Period of the year / project span
    - Timings of the incident / accident
    - Age profile of victims
    - Body parts involved
    - Penalty levied for causing incident / accident

3.3.24 Unsuitable Land Conditions

Contractor shall take appropriate measures and necessary work permits/clearances if work is to be done in or around marshy areas, river crossings, mountains, monuments, etc. The Contractor shall make right assessment and take all necessary action for developing work areas to make them safe & suitable for crane operations or other vehicular movement before carrying out any project related activity / operation. Contractor shall take all necessary actions to make the surroundings of its site establishments (site office, stores, lay-down area etc.) work-worthy safe and secure.

3.3.25 Under Water Inspection

Contractor shall ensure that boats and other means used for transportation, surveying & investigation works shall be certified seaworthy by a recognized classification society. It shall be equipped with all life saving devices like life jackets, adequate fire protection arrangement sand shall possess communication facilities like cellular phones, wireless, walkie-talkie. All divers used for seabed surveys, underwater inspections shall have required authorized license, suitable life-saving kit. Number of hours of work by divers shall be limited as per regulations. EIL/ Owner shall have the right to inspect the boat and scrutinize documents in this regard.

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3.3.26 Excavation

The Contractor shall obtain permission from competent authorities prior to excavation wherever required.

The Contractor shall locate the position of buried utilities (water line, cable route, etc.) by referring to project / plant drawing / in consultation with EIL/Owner. The Contractor shall start digging manually to locate the exact position of buried utilities & thereafter use mechanical means.

In case of non-availability of sufficient data/drawings, underground services i.e. underground cable/ pipe shall be checked by cable detector/pipe locator by the contractor.

The Contractor shall keep soil heaps at least 1.5 M away from edge or a distance equal to depth of pit (whichever is more)

All excavated pits greater than 10 Sq.M plan area and depth more than 1.5M shall have at least two access routes for ingress and egress. Also, additional access routes shall be provided such that distance between any two access routes shall not be more than 20M.

The Contractor shall maintain sufficient "angle of repose" during excavation – shall also provide slope or suitable bench as decided by EIL / Owner.

The Contractor shall arrange "battering" or "benching" wherever required for preventing collapse of edge of excavations.

Avoid vertical wall of less than 2mtrs between two adjacent deep excavated pit/area. Further deep excavation should not be kept open for a longer duration.

The Contractor shall identify & arrange de-watering pump or well-point system to prevent earth collapse due to heavy rain / influx of underground water.

The Contractor shall arrange protective fencing/hard barricading with warning signal around excavated pits, trenches, etc. along with minimum 2 (two) entries, exits / escape ladders.

The Contractor must avoid "underpinning" / under-cutting to prevent collapse of chunk of earth during excavation.

The Contractor shall use "stoppers" to prevent over-run of vehicle wheels at the edge of excavated pits / trenches. Vehicles movement should be restricted to minimum three meters away from the excavated pit.

The Contractor shall arrange strengthening of "shoring" & "strutting" proactively to avoid collapse of earth / edges due to vehicular movement in close proximity of excavated areas / pits/ trenches, etc.

3.4 Tool Box Talks (TBT)

Contractor shall conduct daily TBT with workers prior to start of work and shall maintain proper record of the meeting. A suggested format is given below. The Job specific TBT is to be conducted by the immediate supervisor of the workers.

The Contractor shall conduct TBT before start of every morning or evening shift or night shift activities, for alerting the workers on specific hazards and their appropriate dos & don'ts. The Contractor shall provide sufficient rests to the site workmen and their foremen to avert fatigue & thereby endangering their lives during the course of site works.

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TOOLBOX TALK RECORDING SHEET		
Date & Time		
Work Location		
Subject (Nature of work)		
Presenter		
Hazards involved		
Precautions to be taken		
Worker's Name	Signature	Section
Remarks, in any		

The topics during TBT shall include

- Hazards related to work assigned on that day and precautions to be taken.
- Any forthcoming HSE hazards/events/instruction/orders, etc.

The above record can be kept in local language, which workers can read. These records shall be made available to EIL/ Owner whenever demanded.

3.5 Training & Induction Programme

a) Initial induction of workers into Construction oriented activities and appraising them about the methodology of works and how to carry-out safely and the same should not be inter mixed with Tool Box Talks or HSE Training. In this regard careful action should be made& maintained for imparting HSE induction to every individual, irrespective of his task/designation/level of employment, whereas, HSE Training should be imparted to specific person/group of people who are to carry-out that specific task more than once – for example, Riggers must be trained for working at heights, welders must be trained for work in confined space, fitters/carpenters, mesons must be trained for work at heights, etc.
Contractor shall arrange suitable facilities (e.g training room/place, audio visual facilities etc.) for organizing such training on HSE.

b) Contractor shall conduct Safety induction programme on HSE for all his workers and maintain records. Sticker for "Safety Induction" shall be pasted on the safety helmet of the site personnel. The Gate Pass shall be issued only to those workers who successfully qualify the Safety induction programme. Contractor to conduct effective safety induction program at work site by making efforts to arrange Video film/Virtual Reality (VR) technology pertaining to the escape routes, assembly points, risks involved in the event of an emergency etc while imparting safety induction.

c) The Contractor brief the visitors about the HSE precautions which are required to be taken before their proceeding to site and make necessary arrangements to issue appropriate PPEs like Aprons, hard hats, ear-plugs, goggles & safety shoes etc., to his visitors. The Contractor shall always maintain relevant acknowledgement from visitor on providing him brief information on HSE actions.

d) Contractor shall submit job specific training schedule for approval of EIL/Owner &ensure that all his personnel possess appropriate training to carry out the assigned job safely. The training should be imparted in a language understood by them and should specifically be trained about

- Potential hazards to which they may be exposed at their workplace

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- Measures available for prevention and elimination of these hazards

The topics during training shall cover, at the minimum: -

- Why safety should be considered during work - explanation
- Education about hazards and precautions required
- Employees' duties & responsibilities
- Emergency and evacuation plan
- HSE requirements during project activities
- Fire fighting and First-Aid
- Use of PPEs
- Occupational health issues – dos & don'ts
- Local laws on intoxicating drinks, drugs, smoking in force
- Common environmental subjects – lighting, ventilation, vibration, smoke/fumes etc.

e) Records of the training shall be kept and submitted to EIL/ Owner.

f) The Contractor shall make regular program for conducting Safety Training on various topics related to various activities & their safe-guarding utilizing experienced persons / outside agency / faculty. A program for Safety Training (indicative list as per Appendix –F) shall be furnished by the Contractor in its HSE Plan.

g) For offshore and jetty jobs, contractor shall ensure that all personnel deployed have undergone a structured sea survival training including use of lifeboats, basket landing, use of radio communication etc. from an agency acceptable to Owner/EIL.

3.6 ADDITIONAL SAFETY REQUIREMENTS FOR WORKING INSIDE A RUNNING PLANT

As a minimum, the contractor shall ensure adherence to following safety requirements while working in or in the close vicinity of an operating plant:

a) Contractor shall obtain permits for Hot work, Cold work, Excavation and Confined Space from Owner in the prescribed format.

b) The contractor shall monitor record and compile list of his workers entering the operational plant/unit each day and ensure & record their return after completing the job.

c) Contractor's workers and staff members shall use designated entrances and proceed by designated routes to work areas only assigned to them. The workers shall not be allowed to enter units' area, tanks area, pump rooms, etc. without work authorization permit.

d) Work activities shall be planned in such a way so as to minimize the disruption of other activities being carried out in an operational plant/unit and activities of other contractors.

e) The contractor shall submit a list of all chemicals/toxic substances that are intended to be used at site and shall take prior approval of the Owner.

f) Specific training on working in a hydrocarbon plant shall be imparted to the work force and mock drills shall be carried out for Rescue operations/First-Aid measures.

g) Proper barricading/cordoning of the operational units/plants shall be done before starting the construction activities. No unauthorized person shall be allowed to trespass. The height and overall design of the barricading structure shall be finalized in consultation with the Owner and shall be got approved from the Owner.

h) Care shall be taken to prevent hitting underground facilities such as electrical cables, hydrocarbon piping during execution of work.

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i) Barricading with water curtain shall be arranged in specific/critical areas where hydrocarbon vapors are likely to be present such as near horton spheres or tanks. Positioning of fire tenders (from owner) shall also be ensured during execution of critical activities.

j) Emergency evacuation plan shall be worked out and all workmen shall be apprised about evacuation routes. Mock drill operations may also be conducted.

k) Flammable gas test shall be conducted prior to any hot work using appropriate measuring instruments. Sewers, drains, vents or any other gas escaping points shall be covered with flame retardant tarpaulin.

l) Respiratory devices shall be kept handy while working in confined zones where there is a danger of inhalation of poisonous gases. Constant monitoring of presence of Gas/Hydrocarbon shall be done.

m) Clearance shall be obtained from all parties before starting hot tapping, patchwork on live lines and work on corroded tank roof.

n) Positive isolation of line/equipment by blinding for welding/cutting/grinding shall be done. Closing of valve will not be considered sufficient for isolation.

o) Welding spatters shall be contained properly by using fire retardant blanket and in no case shall be allowed to fall on the ground containing oil. Similar care shall be taken during cutting operations. Fire watcher to be deployed to ensure the same.

p) The vehicles, cranes, engines, etc. shall be fitted with spark arresters on the exhaust pipe and got it approved from Safety Department of the Owner.

q) Plant air should not be used to clean any part of the body or clothing or use to blow off dirt on the floor.

r) Gas detectors should be installed in gas leakage prone areas as per requirement of Owner's plant operation personnel.

s) Flame proof electrical distribution board, plug and socket shall be used for electrical appliances.

t) Experienced full time safety personnel shall be exclusively deployed to monitor safety aspects in running plants.

3.7 Self-Assessment and Enhancement

The contractor shall develop a method of check & balance through self-assessment& enhancement techniques and shall explore the opportunities for continual improvement in the HSE system.

3.8 HSE Promotion

The contractor shall encourage his workforce to promote HSE efforts at workplace by way of organizing workshops/seminars/training programs, celebrating HSE awareness weeks &National Safety Day, conducting quizzes & essay competitions, distributing pamphlets, posters & material on HSE, providing incentives for maintaining good HSE practices and granting incentives/ bonus for completing the job without any lost time accident.

3.9 Lock Out and Tag Out(LOTO) for Isolation of Energy Source

a) Contractor shall follow the LOTO/Isolation procedure of owner for all energy source isolations installed/under purview by /of owner i.e. "Brown field"

b) For all the other energy source (not under purview of client/owner)i.e. "Green field" Contractor shall develop a system to ensure the isolation of equipments, pipelines, Vessel, electrical panels from the energy source covering following as minimum:-

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- Identification of all energy source viz electrical, mechanical, hydraulic, pneumatic, chemical, thermal, gravitational, radiation and other forms of stored or kinetic energy.
- Establishing the energy isolation devices viz manually operated electrical circuit breakers, disconnection switches, blind flanges, etc.
- Installation of Lock Out devices for preventing the inadvertent release of stored energy and Tag Out devices ("Danger", "Do Not operate" or Do not Remove"tags) to indicate that testing, maintenance or servicing is underway and the device cannot be operated until the tag out device is removed.
- Lock Out and Tag out log book
- Permit for isolation and de-isolation of energy source as per format No.: HSE-16
- Availability of competent persons like experienced operators at substations, pump house, units etc. supervisors etc.

c) Contractor shall ensure that all the sources are locked out and tagged properly before giving clearance to start the job.

d) After the completion of job, contractor shall ensure all tools and tackles are removed and nobody is present in the working area and signing on LOTO log book.

e) Only on confirmation of above the contractor will remove their lock and tag from the isolation points and give instructions for energizing the same. Only the person carrying out the task shall himself carry the key for the lock in /Lock out.

4.0 DETAILS OF HSE MANAGEMENT SYSTEM BY CONTRACTOR

4.1 On Award of Contract

The Contractor shall submit a comprehensive Health, Safety and Environmental Plan or programme for approval by EIL/Owner prior to start of work. The Contractor shall participate in the pre-start meeting with EIL/Owner to finalize HSE Plans which shall including the following:

- HSE policy & Objectives
- Job procedure to be followed by the Contractor for construction activities including handling of equipment's, scaffolding, electric installations, etc. describing the risks involved, actions to be taken and methodology for monitoring each activity. Indicative list of procedures is enclosed as Annexure-H
- EIL/Owner review/audit requirement.
- Organization structure along with responsibility and authority, on HSE activities.
- Administrative & disciplinary steps involving implementation of HSE requirements
- Emergency evacuation plan/ procedures for site and labour camps
- Procedures for reporting & investigation of accidents and near misses.
- HSE Inspection
- HSE Training programme at project site
- HSE Awareness program eat project site
- Reference to Rules, Regulations and statutory requirements.
- HIRAC
- Environment Aspect Impact Register
- Legal Register
- HSE documentation viz reporting, analysis & record keeping.

4.2 During Job Execution

Contractor shall implement approved Health, Safety and Environment management plan or programme including but not limited to as brought out under para 3.0. Contractor shall also ensure:

a) to arrange workmen compensation insurance, registration under ESI Act, third party liability insurance, registration under BOCW Act etc., as applicable.

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b) to arrange all HSE permits before start of activities (as applicable), like permits for hot work, working at heights (Refer Format No. HSE-6), confined space (Refer Format No. HSE-7), Radiation Work Permit (Refer Format No. HSE-8), Demolishing/ Dismantling Work Permit (Refer Format No. HSE-9),Permit for erection/modification & dismantling of scaffolding(Refer Format No:HSE-14),Permit for heavy lift/critical erection (Refer Format No:HSE-15) ,Permit for energy Isolation & De-isolation" (HSE-16) ,storage of chemical/explosive materials & its use and implement all precautions mentioned therein. In this regard, requirements of *Oil industry Safety Directorate Standard No.* Std -105 "Work Permit Systems" shall be complied with while working in existing Oil or Gas processing plants. List of the persons involved shall be maintained as annexure to the work permit issued for a particular activity.

c) to submit, timely, the completed checklist on HSE activities in Format No.HSE-1, Monthly HSE report in Format No.HSE-5 (use of web based package (www.eil.co.in/conthse) is compulsory wherever the facility is available else a hard copy is to be submitted), accident/ incident reports, investigation reports etc. as per EIL/Owner requirements. Compliance of instructions on HSE shall be done by Contractor and informed urgently to EIL/Owner.

d) that his top most executive at site attends all the Safety Committee/HSE meetings arranged by EIL/Owner and carries out safety walk regularly. Only in case of his absence from site that a second senior most person shall be nominated by him, in advance, and communicated to EIL/Owner for performing the above tasks.

e) display at site office and at prominent locations HSE Policy, caution boards, list of hospitals, emergency services available, safety signs like Men at work, Speed Limits, Hazardous Area, various do's & don'ts, etc.

f) provide posters, banners for safe working to promote safety consciousness.

g) identify, assess, analyze & mitigate the construction hazards& incorporate relevant control measures before actually executing site works. (HIRAC = Hazard Identification, Risk Analysis and Control).

h) identify, assess, analyze & mitigate the environmental impact & incorporate relevant control measures through Environmental Aspect Impact Register

i) Identify and comply to all applicable HSE related legal requirements by preparing and maintaining a Legal register.

j) To maintain & monitor the level of legal compliance at site, a committee shall be formed comprising of contractor's RCM as Head and lead representatives as member(s)from HR/Legal, HSE and discipline engineer(s) (Civil, Mechanical, Electrical, Instrumentation) as applicable. Committee shall review the applicable legal requirements during periodical meetings and monitor the compliance status.

k) arrange testing, examination, inspection of own as well as borrowed construction equipment's/ machinery (stationary &mobile) before being used at site and also at periodical interval, through own resources and also by 3rd party competent agencies (as deemed fit in statutes). Records of such test, examination etc. shall be maintained & shall be submitted to EIL/Owner as & when asked for.

l) carryout audits/inspection (internal & external) at his works as well as sub-contractor works as per approved HSE plan/procedure/programme & submit the compliance reports of identified shortfalls for EIL/Owner review.

m) Arranging HSE training for site workmen (of his own &subcontractors) through internal or external faculty at periodical intervals.

n) Assistance& cooperate during HSE audits by EIL/Owner or any other 3rd party and submit compliance report.

o) Generate & submit of HSE records/report as per this specification.

p) Contractor shall arrange minimum 100 lux. illumination level at construction site for night works& record shall be maintained.

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q) Mobile phones shall not be permitted in operational area of the Project Site. However, intrinsically safe mobile phone can be permitted on approval from EIL/Owner. Alternatively, telephone booth(s) may be set up by the contractor after obtaining approval from EIL/Owner. Use of mobile phone shall also be restricted during construction activities such as height work, erection of material, confined space and Pre-commissioning & Commissioning activities at all project sites.

r) The contractor shall assign responsible person as in charge for night works and it shall be informed to owner/EIL.

s) Appraise EIL/Owner on HSE activities at site regularly.

t) Carry-out all dismantling activities safely, with prior approval of EIL/Owner representative.

u) The Contractor shall ensure that "Hot works" and painting works do not continue at the same place/ location at project site for which chance or probability of "fire" incident exists.

4.3 During Short Listing of the Sub-Contractors

The contractor shall review the HSE management system of the sub-contractors in line with the requirements given in this specification. The contractor shall be held responsible for the shortcomings observed in the HSE management system of the sub-contractor(s) during execution of the job.

5.0 RECORDS

At the minimum, the contractor shall maintain/ submit HSE records in the following reporting formats:

Safety Walk Through Report	HSE-1
Accident/ Incident Report	HSE-2
Supplementary Accident/ Incident Investigation report	HSE-3
Near Miss Incident Report	HSE-4
Monthly HSE Report	HSE-5
Permit for working at height	HSE-5
Permit for working in confined space	HSE-7
Permit for radiation work	HSE-8
Permit for demolishing/ dismantling	HSE-9
Daily Safety checklist	HSE-10
Housekeeping Assessment & compliance	HSE-11
Inspection of temporary electrical booth/installation	HSE-12
Inspection for scaffolding	HSE-13
Permit for erection/modification &dismantling of scaffolding	HSE-14
Permit for heavy lift/critical erection.	HSE-15
Permit for Energy isolation and de-isolation.	HSE-16
Permit for Excavation	HSE-17
Environmental Aspect Impact Register	HSE-18
HIRAC Register	HSE-19
Checklist for Tower Crane	HSE-20
Crane Inspection Checklist	HSE-21
Hydraulic Mobile Crane Inspection Checklist	HSE-22
Hydraulic Rig Inspection Checklist	HSE-23

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Boom Lift Inspection Checklist	HSE-24
Inspection reports of Equipment/tools/tackles	*
Report of Toolbox Talks	As indicated in specification
PPE issue report/register	*
Site inspection reports	*
Training records	*

(*) The formats shall be developed by contractor in consultation with EIL/Owner.

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APPENDIX-A
(Sheet 1 of 2)

A. IS CODES ON HSE

SP: 53	Safety code for the use, Care and protection of hand operated tools.
IS: 838	Code of practice for safety & health requirements in electric and gas welding and cutting operations
IS: 1179	Eye & Face precautions during welding, equipment etc.
IS: 1860	Safety requirements for use, care and protection of abrasive grinding wheels.
IS: 1989 (Pt -II)	Leather safety boots and shoes
IS: 2925	Industrial Safety Helmets
IS: 3016	Code of practice for fire safety precautions in welding & cutting operation.
IS: 3043	Code of practice for earthing
IS: 3764	Code of safety for excavation work
IS: 3786	Methods for computation of frequency and severity rates for industrial injuries and classification of industrial accidents
IS: 3696	Safety Code of scaffolds and ladders
IS: 4083	Recommendations on stacking and storage of construction materials and components at site
IS: 4770	Rubber gloves for electrical purposes
IS: 5121	Safety code for piling and other deep foundations
IS: 5216 (Pt-I)	Recommendations on Safety procedures and practices in electrical works
IS: 5557	Industrial and Safety rubber lined boots
IS: 5983	Eye protectors
IS: 6519	Selection, care and repair of Safety footwear
IS: 6994 (Pt-I)	Industrial Safety Gloves (Leather & Cotton Gloves)
IS: 7293	Safety Code for working with construction Machinery
IS: 8519	Guide for selection of industrial safety equipment for body protection
IS: 9167	Ear protectors
IS: 11006	Flash back arrestor (Flame arrestor)
IS: 11016	General and safety requirements for machine tools and their operation
IS: 11057	Specification for Industrial safety nets
IS: 11226	Leather safety footwear having direct moulded rubber sole
IS: 11972	Code of practice for safety precaution to be taken when entering a sewerage system
IS: 13367	Code of practice-safe use of cranes
IS: 13416	Recommendations for preventive measures against hazards at working place

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APPENDIX-A
(Sheet 2 of 2)

B. INTERNATIONAL STANDARDS ON HSE

Safety Glasses	:	ANSI Z 87.1, ANSI ZZ 87.1, AS 1337, BS 2092, BS 1542, BS 679, DIN 4646/ 58311
Safety Shoes	:	ANSI Z 41.1, AS 2210, EN 345
Hand Gloves	:	BS 1651
Ear Muffs	:	BS 6344, ANSI S 31.9
Hard Hat	:	ANSI Z 89.1/89.2, AS 1808, BS 5240, DIN 4840
Goggles	:	ANSI Z 87.1
Face Shield	:	ANSI Z 89.1
Breathing Apparatus	:	BS 4667, NIOSH
Welding & Cutting	:	ANSI Z49.1
Safe handling of compressed:	P-1	(Compressed Gas Association Gases in cylinders 1235 Jefferson Davis Highway, Arlington VA 22202 - USA)
Full body harness	:	EN-361
Lanyard	:	EN-354
Karabiner	:	EN-362 and EN-12275

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APPENDIX-B

DETAILS OF FIRST AID BOX

SL. NO.	DESCRIPTION		QUANTITY
1.	Small size Roller Bandages, 1 Inch Wide	(Finger Dressing small)	6 Pcs.
2.	Medium size Roller Bandages, 2 Inches Wide	(Hand & Foot Dressing)	6 Pcs.
3.	Large size Roller Bandages, 4 Inches Wide	(Body Dressing Large)	6 Pcs.
4.	Large size Burn Dressing	(Burn Dressing Large)	4 Pkts.
5.	Cotton Wool	(20 gms packing)	4 Pkts.
6.	Antiseptic Solution Dettol (100 ml.) or Savlon		1 Bottle
7.	Mercurochrome Solution (100 ml.) 2% in water		1 Bottle
8.	Ammonia Solution (20 ml.)		1 Bottle
9.	A Pair of Scissors		1 Piece
10.	Adhesive Plaster (1.25 cm X 5 m)		1 Spool
11.	Eye pads in Separate Sealed Pkt.		4 pcs.
12.	Tourniqut		1 No.
13.	Safety Pins		1 Dozen
14.	Tinc. Iodine/ Betadine (100 ml.)		1 Bottle
15.	Polythene Wash cup for washing eyes		1 No.
16.	Potassium Permanganate (20 gms.)		1 Pkt.
17.	Tinc. Benzoine (100 ml.)		1 Bottle
18.	Triangular Bandages		2 Nos.
19.	Band Aid Dressing		5 Pcs.
20.	Iodex/Moov(25 gms.)		1 Bottle
21.	Tongue Depressor		1 No.
22.	Boric Acid Powder (20 gms.)		2 Pkt.
23.	Sodium Bicarbonate (20 gms.)		1 Pkt.
24.	Dressing Powder (Nebasulf) (10 gms.)		1 Bottle
25.	Medicinal Glass		1 No.
26.	Duster		1 No.
27.	Booklet (English& Local Language)		1 No. each
28.	Soap		1 No.
29.	Toothache Solution		1 No.
30.	Vicks (22 gms.)		1 Bottle
31.	Forceps		1 No.
32.	Snake –Bite Lancet		1No.
33.	Note Book		1 No.
34.	Splints		4 Nos.
35.	Lock		1 Piece
36.	Life Saving/Emergency/Over-the counter Drugs		As decided at site

Box size: Suitable size first aid box to be used for first aid items

Note : The medicines prescribed above are only indicative. Equivalent medicines can also be used. A prescription, in this regard, shall be required from a qualified Physician.

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APPENDIX-C

TYPE OF FIRES VIS-À-VIS FIRE EXTINGUISHERS

Fire Extinguisher → / Fire ↓	Water	Foam	CO_2	Dry Powder	Multi purpose (ABC)
Originated from paper, clothes, wood	✔	✔	can control minor surface fires	can control minor surface fires	✔
Inflammable liquids like alcohol, diesel, petrol, edible oils, bitumen	×	✔	✔	✔	✔
Originated from gases like LPG, CNG, H_2	×	×	✔	✔	✔
Electrical fires	×	×	✔	✔	✔

LEGEND : ✔ : CAN BE USED

× : NOT TO BE USED

Note: Fire extinguishing equipment must be checked atleast once a year and after every use by an authorized person. The equipment must have an inspection label on which the next inspection date is given. Type of extinguisher shall clearly be marked on it.

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APPENDIX-D

List of Statutory Acts & Rules Relating to HSE

- The Indian Explosives Act and Rules
- The Motor Vehicle Act and Central Motor Vehicle Rules
- The Factories Act and concerned Factory Rules
- The Petroleum Act and Petroleum Rules
- The Workmen Compensation Act
- The Gas Cylinder Rules and the Static & Mobile Pressure Vessels Rules
- The Indian Electricity Act and Rules
- The Indian Boiler Act and Regulations
- The Water (Prevention & Control & Pollution) Act
- The Water (Prevention & Control of Pollution) Cess Act
- The Mines & Minerals (Regulation & Development) Act
- The Air (Prevention & Control of Pollution) Act
- The Atomic Energy Act
- The Radiation Protection Rules
- The Indian Fisheries Act
- The Indian Forest Act
- The Wild Life (Protection) Act
- The Environment (Protection) Act and Rules
- The Hazardous Wastes (Management & Handling) Rules
- The Manufacturing, Storage & import of Hazardous Chemicals Rules
- The Public Liability Act
- The Building and Other Construction Workers (Regulation of Employment and Condition of Service) Act
- Other statutory acts Like EPF, ESIS, Minimum Wages Act.

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APPENDIX-E(Sheet 1 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
(A) EXCAVATION Pit Excavation upto 3.0m	Falling into pit	Personal injury	Provide guard rails/ barricade with warning signal Provide atleast two entries/ exits. Provide escape ladders.
	Earth Collapse	Suffocation/ Breathlessness Buried	Provide suitable size of shoring and strutting, if required. Keep soil heaps away from the edge equivalent to 1.5m or depth of pit whichever is more. Don't allow vehicles to operate too close to excavated areas. Maintain atleast 2m distance from edge of cut. Maintain sufficient angle of repose. Provide slope not less than 1:1 and suitable bench of 0.5m width at every 1.5m depth of excavation in all soils except hard rock. Battering/benching the sides.
	Contact with buried electric cables Gas/ Oil Pipelines	Electrocution Explosion	Obtain permission from competent authorities, prior to excavation, if required. Locate the position of buried utilities by referring to plant drawings. Start digging manually to locate the exact position of buried utilities and thereafter use mechanical means.
Pit Excavation beyond 3.0m	Same as above plus Flooding due to excessive rain/ underground water	Can cause drowning situation	Prevent ingress of water Provide ring buoys Identify and provide suitable size dewatering pump or well point system
	Digging in the vicinity of existing Building/ Structure	Building/Structure may collapse Loss of health & wealth	Obtain prior approval of excavation method from local authorities. Use under-pining method Construct retaining wall side by side.
	Movement of vehicles/ Equipments close to the edge of cut.	May cause cave-in or slides. Persons may get buried.	Barricade the excavated area with proper lighting arrangements Maintain at least 2m distance from edge of cut and use stop blocks to prevent over-run Strengthen shoring and strutting

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APPENDIX-E: (Sheet 2 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
Narrow deep excavations for pipelines, etc.	Same as above plus Frequent cave-in or slides	May cause severe injuries or prove fatal	Battering/benching of sides Provide escape ladders
	Flooding due to Hydro- static testing	May arise drowning situation	Same as above plus Bail out accumulated water Maintain adequate ventilation.
Rock by excavation blasting	Improper handling of explosives	May prove fatal	Ensure proper storage, handling & carrying of explosives by trained personnel. Comply with the applicable explosive acts & rules.
	Uncontrolled explosion	May cause severe injuries or prove fatal	Allow only authorized persons to perform blasting operations. Smoking and open flames are to be strictly prohibited
	Scattering of stone pieces in atmosphere	Can hurt people	Use PPE like goggles, face mask, helmets etc.
Rock excavation by blasting (Contd)	Entrapping of persons/ animals.	May cause severe injuries or prove fatal	Barricade the area with red flags and blow siren before blasting.
	Misfire	May explode suddenly	Do not return to site for atleast 20 minutes or unless announced safe by designated person.
Piling Work	Failure of pile-driving equipment	Can hurt people	Inspect Piling rigs and pulley blocks before the beginning of each shift.
	Noise pollution	Can cause deafness and psychological imbalance.	Use personal protective equipment's like ear plugs, muffs, etc.
	Extruding rods/casing	Can hurt people	Barricade the area and install sign boards Provide first-aid
	Working in the vicinity of 'Live-Electricity'	Can cause electrocution/ Asphyxiation	Keep sufficient distance from Live-Electricity as per IS code. Shut off the supply, if possible Provide artificial/rescue breathing to the injured
(B) CONCRETING	Air pollution by cement	May affect Respiratory System	Wear respirators or cover mouth and nose with wet cloth.
	Handling of ingredients	Hands may get injured	Use gloves & other PPE.
	Protruding reinforcement rods.	Feet may get injured	Provide platform above reinforcement for movement of workers or provide end caps for protection on reinforcement bars.

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APPENDIX-E :(Sheet 3 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
	Earthing of electrical mixers, vibrators, etc. not done.	Can cause electrocution/ asphyxiation	Ensure earthing of equipments and proper functioning of electrical circuit before commencement of work.
	Falling of materials from height	Persons may get injured	Use hard hats Remove surplus material immediately from work place. Ensure lighting arrangements during night hours
	Continuous pouring by same gang	Cause tiredness of workers and may lead to accident.	Insist on shift pattern Provide adequate rest to workers between subsequent pours.
	Revolving of concrete mixer/ vibrators	Parts of body or clothes may get entrapped.	Allow only mixers with hopper Provide safety cages around moving motors Ensure proper mechanical locking of vibrator.
Super-structure	Same as above plus Deflection in props or shuttering material	Shuttering/props may collapse and prove fatal	Avoid excessive stacking on shuttering material Check the design and strength of shuttering material before commencement of work Rectify immediately the deflection noted during concreting.
	Passage to work place	Improperly tied and designed props/planks may collapse	Ensure the stability and strength of passage before commencement of work. Do not overload and stand under the passage.
(C) REINFOR-CEMENT	Curtailment and binding of rods	Persons may get injured	Use PPE like gloves, shoes, helmets, etc. Avoid usage of shift tools
	Carrying of rods for short distances/at heights	Workers may get injured their hands and shoulders.	Provide suitable pads on shoulders and use safety gloves. Tie up rods in easily liftable bundles Ensure proper staging.
	Checking of clear distance/ cover with hands	Rods may cut or injure the fingers	Use measuring devices like tape, measuring rods, etc.
	Hitting projected rods and standing on cantilever rods.	Persons may get injured and fell down	Use safety shoes and avoid standing unnecessarily on cantilever rods Avoid wearing of loose clothes

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APPENDIX-E:(Sheet 4 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
	Falling of material from height	May prove fatal	Use helmets Provide safety nets
	Transportation of rods by trucks/ trailers	Protruded rods may hit the persons	Use red flags/lights at the ends Do not protrude the rods in front of or by the side of driver's cabin. Do not extend the rods 1/3rd of deck length or 1.5m whichever is less
(D)WELDING AND GAS CUTTING	Welding radiates invisible ultraviolet and infra-red rays	Radiation can damage eyes and skin.	Use specified shielding devices and other PPE of correct specifications. Avoid thoriated tungsten electrodes for GTAW
	Improper placement of oxygen and acetylene cylinders	Explosion may occur	Move out any leaking cylinder Keep cylinders in vertical position Use trolley for transportation of cylinders and chain them Use flashback arrestors
	Leakage/ cuts in hoses	May cause fire	Purge regulators immediately and then turn off Never use grease or oil on oxygen line connections and copper fittings on acetylene lines Inspect regularly gas carrying hoses Always use red hose for acetylene & other fuel gases and black for oxygen
	Opening-up of cylinder	Cylinder may burst	Always stand back from the regulator while opening the cylinder Turn valve slowly to avoid bursting Cover the lug terminals to prevent short circuiting
	Welding of tanks, container or pipes storing flammable liquids	Explosion may occur	Empty & purge them before welding Never attach the ground cable to tanks, container or pipe storing flammable liquids Never use LPG for gas cutting

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APPENDIX-E:(Sheet 5 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES ...(Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
(E) RADIOGRAPHY	Ionizing radiation	Radiations may react with the skin and can cause cancer, skin irritation, dermatitis, etc.	Ensure Safety regulations as per BARC/AERB before commencement of job. Cordon off the area and install Radiation warning symbols Restrict the entry of unauthorized persons Wear appropriate PPE and film badges issued by BARC/AERB
	Transportation and Storage of Radiography source	Same as above	Never touch or handle radiography source with hands Store radiography source inside a pit in an exclusive isolated storage room with lock and key arrangement. The pit should be approved by BARC/AERB. Radiography source should never be carried either in passenger bus or in a passenger compartment of trains. BARC/AERB has to be informed before source movement. Permission from Director General of Civil Aviation is required for booking radio isotopes with airlines.
	Loss of Radio isotope	Same as above	Try to locate with the help of Survey Meter. Inform BARC/AERB (*)
(F) ELECTRICAL INSTALLATION ANDUSAGE	Short circuiting	Can cause Electrocution or Fire	Use rubberized hand gloves and other PPE Don't lay wires under carpets, mats or door ways. Allow only licensed electricians to perform on electrical facilities Use one socket for one appliance Ensure usage of only fully insulated wires or cables Don't place bare wire ends in a socket Ensure earthing of machineries and equipment's Do not use damaged cords and avoid temporary connections Use spark-proof/flame proof type field distribution boxes.

(*) Atomic Energy Regulatory Board (AERB),
Bhabha Atomic Research Centre (BARC)
Anushakti Nagar, Mumbai – 400 094

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APPENDIX-E:(Sheet 6 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
			Do not allow open/bare connections Provide all connections through 30mAELCB Protect electrical cables/equipments from water and naked flames Check all connections before energizing
	Overloading of Electrical System	Bursting of system can occur which leads to fire	Display voltage and current ratings prominently with 'Danger' signs. Ensure approved cable size, voltage grade and type Switch off the electrical utilities when not in use Do not allow unauthorized connections. Ensure proper grid wise distribution of Power
	Improper laying of overhead and underground transmission lines/cables	Can cause electrocution and prove fatal	Do not lay un armoured cable directly on ground, wall, roof of trees Maintain atleast 3m distance from HT cables All temporary cables should be laid atleast 750 mm below ground on 100 mm fine sand overlying by brick soling Provide proper sleeves at crossings/ inter-sections Provide cable route markers indicating the type and depth of cables at intervals not exceeding 30m and at the diversions/termination
(G) FIRE PREVENTION AND PROTECTION	Small fires can become big ones and may spread to the surrounding areas	Cause burn injuries and may prove fatal	In case a fire breaks out, press fire alarm system and shout "Fire, Fire". Keep buckets full of sand & water/ fire extinguishing equipment near hazardous locations. Confine smoking to 'Smoking Zones' only. Train people for using specific type of fire fighting equipments under different classes of fire. Keep fire doors/shutters, passages and exit doors unobstructed. Maintain good housekeeping and first-aid boxes (for details refer Appendix-B). Don't obstruct assess to Fire extinguishers. Do not use elevators for evacuation during fire. Maintain lightening arrestors for elevated structures. Stop all electrical motors with internal combustion.

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APPENDIX-E :(Sheet 7 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
			Move the vehicles from dangerous locations. Remove the load hanging from the crane booms Remain out of the danger areas.
	Improper selection of Fire extinguisher	It may not extinguish the fire	Ensure usage of correct fire extinguisher meant for the specified fire (for details refer Appendix-C). Do not attempt to extinguish Oil and electric fires with water. Use foam cylinders/CO_2/sand or earth.
	Improper storage of highly inflammable substances	Same as above	Maintain safe distance of flammable substances from source of ignition. Restrict the distribution of flammable materials to only min. necessary amount. Construct specifically designed fuel storage facilities. Keep chemicals in cool and dry place away from heat. Ensure adequate ventilation. Before welding operation, remove or shield the flammable material properly. Store flammable materials in stable racks, correctly labeled preferably with catchment trays. Wipe off the spills immediately
	Short circuiting of electrical system	Same as above Can cause Electrocution	Don't lay wires under carpets, mats or door ways Use one socket for one appliance. Use only fully insulated wires or cables. Do not allow open/bare connections. Provide all connections through 30mAELCB. Ensure earthing of machineries and equipments.
(H) VEHICULAR MOVEMENT	Crossing the Speed Limits (Rash driving)	Personal injury	Obey speed limits and traffic rules strictly. Always expect the unexpected and be a defensive driver. Use seat belts/helmets. Blow horn at intersections and during overtaking operations. Maintain the vehicle in good condition. Do not overtake on curves, bridges and slopes.
	Adverse weather condition	Same as Above	Read the road ahead and ride to the left. Keep the wind screen and lights clean. Do not turn at speed. Recognize the hazard, understand the defense and act correctly in time.

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APPENDIX-E :(Sheet 8 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
	Consuming alcohol before and during the driving operation	Same as above	Alcohol and driving do not mix well. Either choose alcohol or driving. If you have a choice between hitting a fixed object or an on-coming vehicle, hit the fixed object Quit the steering at once and become a passenger. Otherwise take sufficient rest and then drive. Do not force the driver to drive fast and round the clock. Do not day dream while driving
	Falling objects/ Mechanical failure	May prove fatal	Ensure effective braking system, adequate visibility for the drives, reverse warning alarm. Proper maintenance of the vehicle as per manufacturer instructions
(I) PROOF TESTING (HYDROSTATIC/ PNEUMATIC TESTING)	Bursting of piping Collapse of tanks Tanks flying off	May cause injury and prove fatal	Prepare test procedure & obtain EIL/owner's approval. Provide separate gauge for pressurizing pump and piping/equipment. Check the calibration status of all pressure gauges, dead weight testers and temperature recorders. Take dial readings at suitable defined intervals and ensure most of them fall between 40-60% of the gauge scale range. Provide safety relief valve (set at pressure slightly higher than test pressure) while testing with air/ nitrogen. Ensure necessary precautions, stepwise increase in pressure, tightening of bolts/nuts, grouting, etc. before and during testing. Keep the vents open before opening any valve while draining out of water used for hydro-testing of tanks. Pneumatic testing involves the hazard of released energy stored in compressed gas. Specific care must therefore be taken to minimize the chance of brittle failure during a pneumatic leak test. Test temperature is important in this regard and must be considered when the designer chooses the material of construction.

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APPENDIX-E :(Sheet 9 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
			A pressure relief device shall be provided, having a set pressure not higher than the test pressure plus the lesser of 345 KPa (50 psi) or 10% of the test pressure. The gas used as test fluid, if not air, shall be nonflammable and nontoxic.
(J) WORKING AT HEIGHTS	Person can fall down	May sustain severe injuries or prove fatal	Provide guard rails/barricade at the work place Use PPE like full body harness, life line, helmets, safety shoes, etc. Obtain a permit before starting the work at height above 2 meters Fall arrest and safety nets, etc. must be installed Provide adequate working space(min. 0.6 m) Tie/weld working platform with fixed support Use roof top walk ladder while working on a slopping roofs Avoid movement on beams
		May hit the scrap/material stacked at the ground or in between	Keep the work place neat and clean Remove the scrap immediately
	Material can fall down	May hit the workers working at lower levels and prove fatal	Same as above plus Do not throw or drop materials or equipment from height. i.e. do not *bomb* materials All tools to be carried in a tool-kit Bag or on working uniform Remove scrap from the planks Ensure wearing of helmet by the workers working at lower levels. Multiple activities at same location to be avoided. .
(K) CONFINED SPACES	Suffocation/ drowning	Unconsciousness, death	Use respiratory devices, if reqd. Avoid overcrowding inside a confined space Provide Exhaust fans for ventilation Do not wear loose clothes, neck ties, etc. Fulfill conditions of the permit

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APPENDIX-E:(Sheet 10 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
			Check for presence of hydrocarbons, O_2 level Obtain work permit before entering a confined space Ensure that the connected piping of the equipment which is to be opened is pressure free, fluid has been drained, vents are open and piping is positively isolated by a blind flange
	Presence of foul smell and toxic substances	Inhalation can pose threat to life	Same as above plus Check for hydrocarbon and Aromatic compounds before entering a confined space Depute one person outside the confined space for continuous monitoring and for extending help in case of an emergency
	Ignition/ flame can cause fire	Person may sustain burn injuries or explosion may occur	Keep fire extinguishers at a hand distance Remove surplus material and scrap immediately Do not smoke inside a confined space Do not allow gas cylinders inside a confined space Use low voltage (24V) lamps for lighting Use tools with air motors or electric tools with max. voltage of 24V Remove all equipment's at the end of the day
(L) HANDLING AND LIFTING EQUIPMENTS	Failure of load lifting and moving equipment's	Can cause accident and prove fatal	Avoid standing under the lifted load and within the operating radius of cranes. Check periodically oil, brakes, gears, horns and tyre pressure of all moving machinery. Check quality, size and condition of all chain pulley blocks, slings, U-clamps, D-shackles, wire ropes, etc. Allow crane to move only on hard, firm and leveled ground. Allow lifting slings as short as possible and check gunny packings at the friction points. Do not allow crane to tilt its boom while moving Install Safe Load Indicator. Ensure certification by applicable authority.

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APPENDIX-E :(Sheet 11 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
	Overloading of lifting equipments	Same as above	Safe lifting capacity of derricks and winches written on them shall be got verified The max. safe working load shall be marked on all lifting equipments Check the weight of columns and other heavy items painted on them and accordingly decide about the crane capacity, boom and angle of erection Allow only trained operators and riggers during crane operation.
	Overhead electrical wires	Can cause electrocution and fire	Do not allow boom or other parts of crane to come within 3m reach of overhead HT cables Hook and load being lifted shall preferably remain in full visibility of crane operators.
(M) SCAFFOLDING, FORMWORK AND LADDERS	Person can fall down	Person May sustain severe injuries and prove fatal	Provide guard rails for working at height. Face ladder while climbing and use both hands. Ladders shall extend about 1m above landing for easy access and tying up purpose. Do not place ladders against movable objects and maintain base at 1/4 unit of the working length of the ladder. Suspended scaffolds shall not be less than 500 mm wide and tied properly with ropes. No loose planks shall be allowed. Use PPE, like helmets, safety shoes etc.
	Failure of scaffolding material	Same as above	Inspect visually all scaffolding materials for stability and anchoring with permanent structures. Design scaffolding for max. load carrying capacity. Scaffolding planks shall not be less than 50X250 mm full thickness lumber or equivalent. These shall be cleated or secured and must extend over the end supports by at least 150mm and not more than 300mm. Don't overload the scaffolds. Do not splice short ladders to make a longer one. Vertical ladders shall not exceed 6m.
	Material can fall down	Persons working at lower level gets injured	Remove excess material and scrap immediately. Carry the tools in a tool-kit bag only. Provide safety nets.

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APPENDIX-E:(Sheet 12 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS &PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
(N) STRUC-TURAL WORKS	Personal negligence and danger of fall	Can cause injury or casualty	Do not take rest inside rooms built for welding machines or electrical distribution system. Avoid walking on beams at height. Wear helmet with chin strap and full body harness while working at height. Use hand gloves and goggles during grinding operations. Cover or mark the sharp and projected edges. Do not stand within the operating radius of cranes.
	Lifting/ slipping of material	Same as above	Do not stand under the lifted load. Stack properly all the materials. Avoid slippage during handling. Control longer pieces lifted up by cranes from both ends. Remove loose materials from height. Ensure tightening of all nuts & bolts.
(O)PIPELIN E WORKS	Erection/ lowering failure	Can cause injury	Do not stand under the lifted load. Do not allow any person to come within the radii of the side boom handling pipes. Check the load carrying capacity of the lifting tools & tackles. Use safe Load Indicators (SLI). Use appropriate PPEs.
	Other	Same as above	Wear gum boots in marshy areas. Allow only one person to perform signaling operations while lowering of pipes. Wedges to be provided below the pipe to prevent spool/pipe roll out. Provide night caps on pipes. Provide end covers on pipes for stoppage of pigs while testing/ cleaning operations.
(P) GRIT BLASTING	Pollution in neighboring area, hit by grit sand high pressure air	Can cause personal injury	Ensure the blasting is done in enclosed shed. Keep safe distance while blasting operations. Wear positive pressure blast hood or helmet with view-window, ear-muff/plug, gloves, overall or leather coat /apron, rubber shoes.

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APPENDIX-F

TRAINING SUBJECTS / TOPICS

(For contractors' personnel)

1. The Law & Safety – Statutory Requirement / Applicable statutes / Duties of employer / employee.
2. Policy & Administration – Why HSE? / Duties & Responsibilities of Safety Personnel at project site / Effect of incentive on accident prevention.
3. HSE & Supervision – Duties of Supervisor / HSE integrated supervision / Who should be held responsible for site accidents?
4. Safety Budget / Cost of Accidents – Direct costs / Indirect costs.
5. Hazard Identification / Type of hazards / HIRAC.
6. Behavioral Safety & Motivation.
7. Housekeeping – Storage / Stacking / Handling of materials / Hydraulic Mobile Crane handling.
8. Occupational Health in Construction sector.
9. Personal Protective Equipment's – Respiratory & Non- respiratory.
10. Electricity & Safety – ELCB / Fuse / Powered tools / Project illumination.
11. Handling of Compressed Gas – Transportation / Storage / FBAs / Fire prevention.
12. Machine Safety – Machine guarding / Maintenance.
13. Transportation – Hazards & risks in transp. of materials / ODC consignments.
14. Cranes & Other Lifting machinery – Legal requirements vis-à-vis essential safety requirements.
15. Communication – HSE Induction / TBTs / Safety Committee / Safety meeting / Safety propaganda / Publicity.
16. Excavation – Risks & Dangers / Safety measures.
17. Working at Heights – Use of ladder / Work on roofs / Scaffolds / Double harness lanyards / Life-line / Fall arrester / Safety Nets / Floor openings.
18. Hazards in Welding & important safety precautions.
19. Gas Cutting – Hazards & safety measures.
20. Fire prevention & fire protection.

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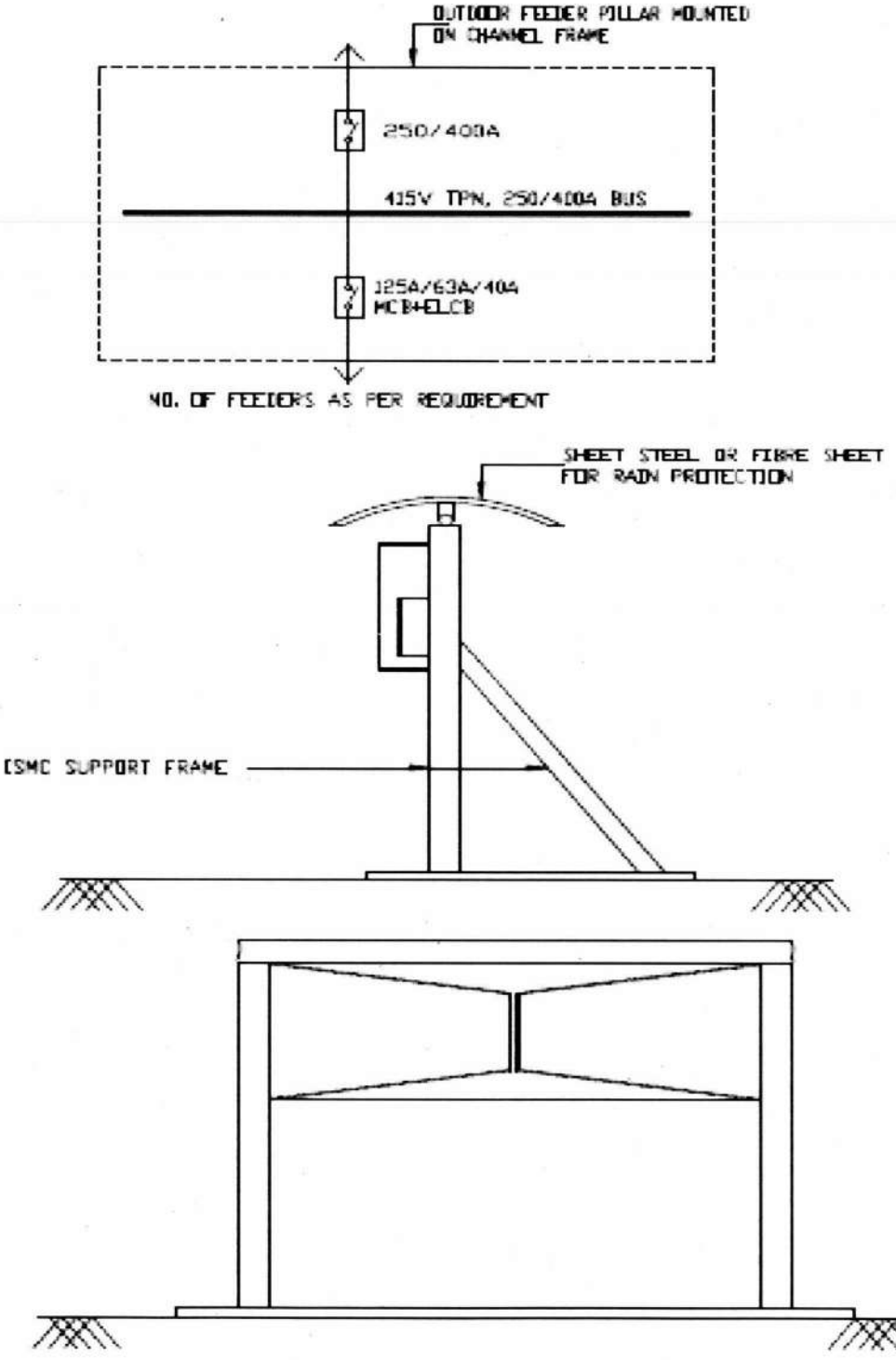
APPENDIX - G

CONSTRUCTION POWER BOARD(typ)



NOTES:-

1. CONTRACTOR TO INSTALL TEMPORARY CONST. POWER BOARD AS SHOWN IN THE DRG. ITS LOCATION SHALL BE EASILY ACCESABALE.
2. POWER DISTRIBUTION BOARD SHALL BE EARTHED AT TWO POINTS BY MINIMUM 40X5MM GI STRIP FROM THE AVILABLE GRID OR DIRECTLY CONNECTED TO TWO DIRECTLY DRIVEN EARTH ELECTRODES.
3. DISTRIBUTION BOARD SHALL BE FABRICATED BY USING 14MM CRCA SHEET STEELWITH HINGED DOORSAND ALL COMPONENT MOUNTED IN IT.
4. ALL INCOMING AND OUTGOING CABLESSHALL HAVE BOTTOM ENTRY.

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APPENDIX-H

LIST OF PROCEDURES (MINIMUM) TO BE FORMING PART OF HSE PLAN:-

A. HSE Management Procedures:

- HSE Risk Management (including HIRA)
- HSE Legal Compliance and Other Requirements
- HSE Objectives & Performance
- HSE Training and Competence (including Induction)
- HSE Motivation &Award Scheme
- HSE Audits
- HSE Sub Contractor Management
- HSE Emergency Management
- HSE Incidents Reporting and Management
- HSE procedure for Behaviour based Safety
- First Aid & Management
- Roles, Responsibility, accountabilities and Authorities

B. Job procedures/Safe Operating procedures

- Setting Up Site &Signages
- Working at Height
- Confined Space Entry
- Permit to Work (including hot works)
- Housekeeping
- Transportation of materials including Manual Handling
- Earthmoving Operations & excavation
- Scaffolding
- Fire Prevention/Protection
- Hazardous Substance handling & Storage
- Personal Protective Equipment

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APPENDIX-I

LIFE SAVING RULES

Bypassing Safety Controls

Obtain authorisation before overriding or disabling safety controls

- I understand & use safety-critical equipment and procedure which apply to my task
- I obtain authorization before:
  - disabling or overriding safety equipment
  - deviating from procedures
  - crossing a barrier

Confined Space

Obtain authorisation before entering a confined space

- I confirm energy sources are isolated
- I confirm the atmosphere has been tested and is monitored
- I check and use my breathing apparatus when required
- I confirm there is an attendant standing by
- I confirm rescue plan is in place
- I obtain authorization to enter

Driving

Follow safe driving rules

- I always wear a seatbelt
- I do not exceed the speed limit, and reduce my speed for road conditions
- I do not use phones or operate devices while driving
- I am fit, rested and fully alert while driving
- I follow journey management requirements

Energy Isolation

Verify isolation and zero energy before work begins

- I have identified all energy sources
- I confirm that hazardous energy sources have been isolated, locked and tagged
- I have checked there is zero energy and tested for residual or stored energy

Hot Work

Controls flammables and ignition sources

- I identify and control ignition sources
- Before starting any hot work:
  - I confirm flammable material has been removed or isolated
  - I obtain authorization
- Before starting hot work in a hazardous are I confirm:
  - a gas test has been completed
  - gas will be monitored continually

Line of Fire

Keep yourself and others out of the line of fire

- I position myself to avoid:
  - moving objects
  - vehicles
  - pressure releases
  - dropped objects
- I establish and obey barriers and exclusion zones
- I take action to secure loose objects and report potentialdropped objects

Safe Mechanical Lifting

Plan lifting operations and control the area

- I confirm that the equipment and load have been inspected and are fit for purpose
- I only operate equipment that I am qualified to use
- I establish and obey barriers and exclusion zones
- I never walk under a suspended load

Work Authorization

Work with a valid permit when required

- I am authorised to perform the work
- I understand the permit
- I have confirmed that hazards are controlled and it is safe to start
- I stop and reassess if conditions change

Work at Height

Protect yourself against a fall when working at height

- I inspect my fall protection equipment before use
- I secure tools and work materials to prevent dropped objects
- I tie off 100% to approved anchor points while outside a protected area

Excavation

Follow safe excavation procedure

- Before starting any excavation:
  - I confirm availability of underground utilities
  - I obtain authorization
  - I take adequate precautions to prevent collapse of soil

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FORMAT NO. : HSE-1 REV 1

(Sheet 1 of 6)

SAFETY WALK-THROUGH REPORT

(Name & signature of walk through performer to be inserted at the bottom of each page)

Project : _____ Report no. : _____

Date : _____ Ccontractor : _____

Inspection by : _____ Owner : _____

Frequency : Monthly Job no. : _____

Note : Write 'NA' wherever the item is not applicable

SL. NO.	ITEM	Satisfactory/ Yes	Non satisfactory/ No	Remarks	Action
1.	HOUSEKEEPING				
a)	Waste containers provided and used				
b)	Sanitary facilities adequate and Clean				
c)	Passageways and Walkways Clear				
d)	General neatness of working areas				
e)	Other				
2.	PERSONNEL PROTECTIVE EQUIPMENT				
a)	Goggles; Shields				
b)	Face protection				
c)	Hearing protection				
d)	Foot protection				
e)	Hand protection				
f)	Respiratory Masks etc.				
g)	Full body harness conforming to CE, EN 361				
h)	Hard hat (HDPE)				
i)	Other				
3.	EXCAVATIONS/OPENINGS				
a)	Openings properly covered or barricaded				
b)	Excavations shored				
c)	Excavations barricaded				
d)	Overnight lighting provided				
e)	Other				

Safety walk-through performer (Name & Signature).....

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FORMAT NO. : HSE-1 REV 1

(Sheet 2 of 6)

SL. NO.	ITEM	Satisfactory/ Yes	Non satisfactory/ No	Remarks	Action
4.	WELDING & GAS CUTTING				
a)	Gas cylinders chained upright				
b)	Cables and hoses not obstructing				
c)	Screens or shields used				
d)	Flammable materials protected				
e)	Live electrode bits contained properly				
f)	Fire extinguisher (s) accessible				
g)	Other				
5.	SCAFFOLDING & BARRICADING				
a)	Fully decked platforms				
b)	Guard and intermediate rails in place				
c)	Toe boards in place				
d)	Adequate shoring				
e)	Adequate access				
f)	Positive barricading for critical activities				
g)	Installation of warning signs				
h)	Other				
6.	LADDERS				
a)	Extension side rails 1 m above				
b)	Top of landing				
c)	Properly secured				
d)	Angle + 70^0 from horizontal				
e)	Other				

Safety walk-through performer (Name &Signature).....

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FORMAT NO. : HSE-1 REV 1

(Sheet 3 of 6)

SL. NO.	ITEM	Satisfactory/ Yes	Non satisfactory/ No	Remarks	Action
7.	HOISTS, CRANES AND DERRICKS				
a)	Condition of cables and sheaves OK				
b)	Condition of slings, chains, hooks and eyes O.K.				
c)	Inspection and maintenance log-books maintained				
d)	Outriggers used				
e)	Reverse horn installed / active / coupled with gear				
f)	Signs/barricades provided				
g)	Signals observed and understood				
h)	Qualified operators				
i)	Other				
8.	MACHINERY, TOOLS AND EQUIPMENT				
a)	Proper instruction				
b)	Safety devices				
c)	Proper cords				
d)	Inspection and maintenance				
e)	Other				
9.	VEHICLE AND TRAFFIC				
a)	Rules and regulations observed				
b)	Inspection and maintenance				
c)	Licensed drivers				
d)	Other				

Safety walk-through performer (Name &Signature).....

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FORMAT NO. : HSE-1 REV 1

(Sheet 4 of 6)

SL. NO.	ITEM	Satisfactory/ Yes	Non satisfactory/ No	Remarks	Action
10.	TEMPORARY FACILITIES				
a)	Emergency instructions posted				
b)	Fire extinguishers provided				
c)	Fire-aid equipment available				
d)	Secured against storm damage				
e)	General neatness				
f)	In accordance with electrical requirements				
g)	Other				
11.	FIRE PREVENTION				
a)	Personnel trained& instructed to make use of facility				
b)	Fire extinguishers checked periodically & record maintained				
c)	No smoking in Prohibited areas.				
d)	Fire Hydrants not obstructed				
e)	Regular fire drill conducted				
12.	ELECTRICAL				
a)	Use of 3-core armored cables everywhere				
b)	Usage of 'All insulated' or 'double-insulated' electrical tools				
c)	All electrical connection are routed through ELCB				
d)	Natural Earthing at the source of power (Main DB)				
e)	Continuity and tightness of earth conductor				
f)	Effective covering of junction boxes, panels and other energized wiring places				
g)	Ground fault circuit interrupters provided				
h)	Prevention of tripping hazards maintained				
f)	DCP extinguishers arranged & licensed electrician engaged at site				

Safety walk-through performer (Name &Signature).....

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FORMAT NO. : HSE-1 REV 1

(Sheet 5 of 6)

SL. NO.	ITEM	Satisfactory/ Yes	Non satisfactory/ No	Remarks	Action
13.	HANDLING AND STORAGE OF MATERIALS				
a)	Safely stored or stacked				
b)	Passageways clear / free from obstructions				
c)	Fire fighting facility in place				
14.	FLAMMABLE GASES AND LIQUIDS				
a)	Containers clearly identified / protected from fire				
b)	Safe storage & transportation arrangement made				
c)	Fire extinguishers positioned nearby				
d)	Facilities kept away from electric spark, hot spatters & ignition source.				
15.	WORKING AT HEIGHT				
a)	Approved Erection plan and work permit in place				
b)	Safe access, Safe work platform & Safety nets provided				
c)	Life lines, Fall arrester, Full body harness with double lanyards used;				
d)	Health Check record available for workers going up?				
e)	Protective handrails arranged around floor openings				
16.	CONFINED SPACE				
a)	Work Permit obtained from requisite authority				
b)	Test for toxic gas and sufficient availability of oxygen conducted & status				
c)	Supervisor present at site & at least one person outside the confined space for monitoring deputed				
d)	Availability of safe means of entry, exit and ventilation (register for entry & exit maintained)				
e)	Fire extinguisher and first-aid facility ensured				
f)	Lighting provision made by using 24V Lamp				
g)	Proper usage of PPEs ensured				
17.	RADIOGRAPHY				
a)	Proper storage and handling of source as per BARC/ AERB guidelines (authorized radiographer available)				
b)	Work permit obtained				

Safety walk-through performer (Name &Signature).....

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FORMAT NO. : HSE-1 REV 1

(Sheet 6 of 6)

SL. NO.	ITEM	Satisfactory/ Yes	Non satisfactory/ No	Remarks	Action
c)	Cordoning of the area done				
d)	Use of appropriate PPE's ensured				
e)	HSE training to workers/supervisors imparted during the fortnight (indicate topic)				
f)	Minimum occupancy of workplace ensured				
18.	HEALTH CHECKS				
a)	All Workers medically examined and found be fit for working at heights (slinging, rigging, painting etc.) in confined space in excavation / trenching in shot blasting				
b)	Availability of First Aid box with contents				
c)	Proper sanitation at site, office and labour camps				
d)	Arrangement of medical facilities.				
e)	Measures for dealing with illness at site & labour camps.				
f)	Availability of Potable drinking water for workmen & staff.				
g)	Provision of crèches for children.				
h)	Stand by vehicle / ambulance available for evacuation of injured				
i)	Adherence to Govt. Guidelines/procedures during epidemic and pandemic (as applicable).				
19.	ENVIRONMENT				
a)	Chemical and Other Effluents properly disposed				
b)	Cleaning liquid of pipes disposed off properly				
c)	Seawater used for hydro-testing disposed off as per agreed procedure				
d)	Lubricant Waste/Engine oils properly disposed				
e)	Waste from Canteen, offices, sanitation etc. disposed properly				
f)	Disposal of surplus earth, stripping materials, Oily rags and combustible materials done properly				
g)	Green belt protection				

Safety walk-through performer (Name &Signature).....

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FORMAT NO. : HSE-2 REV 0

(Sheet 1 of 3)

ACCIDENT REPORT

(To be submitted by Contractor after every Accident within 24 hours to EIL/ Owner)

Report No.: _____ **Date:** _____

Project site: _____ **Name of work:** _____

Contractor's name: _____ Contractor's Job Engineer (name) _____

Non-disabling injury (Non-LTI)	Hospitalized but resumed duty before end of 48 hrsof accident	
Disabling injury (other LTI)	Hospitalized & failed to resume duty within next 48 hrs	
Fatal (LTI):	Death / Expiry	
First Aid case	Resume duty after first aid	

Name of the injured:_____ Father's name of victim: _____

Sub Contractor's Name: .....

Gate Pass No.:.....Age: _____Yrs. Victim's medical fitness exam. (Pre-empl.) date: - _____

Date & time of Accident / Incident: _____

Names of Witnesses: (1_____ (2)_____ (3) _____

Profession of victim:

Bar bender		Carpenter		Meson	
Fitter		Helper		Gas cutter	
Grinder		Welder		Electrician	
Driver		Rigger		M/c.operator	
Engineer		Manager		Other/specify	

Qualification

No formal education		Non-Matriculate		Matriculate	
Graduate		Post- grad		Other/specify	

Job Experience

NIL		Less than 2 yrs		2-5 yrs	
5-10 yrs		11-15 yrs		15 years and above	

Location where the incident happened: _____

_____

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FORMAT NO. : HSE-2 REV 0

(Sheet 2 of 3)

Activity / Works that were continuing during incident / accident: -

Excavation		Demolition		Concrete carrying	
Concrete pouring		Transportation of materials (manually)		Transportation of materials (mechanically)	
Work on or adjacent to water		Work at height (+2.0 mts)		Scaffold preparation	
Scaffold dismantling		Piling works		Welding	
Grinding		Gas-cutting		Pipe fit-ups & fabrication	
Structural fabrications		Machine works		Hydro-testing works	
Electrical works		Erection activities		Other/specify	

What exactly the victim was doing just before the incident / accident? .....

.....

.....

Nature of injury:

Bruise or Contusion		Abrasion (superficial wound)		Sprains or strains	
Cut or Laceration		Puncture or Open wound		Burn	
Inhalation of toxic or Poisonous fumes or gases		Absorption		Amputation	
Fracture		Other/specify			

Parts of body involved in incident / accident

Head		Face		Eyes	
Throat		Arm (above wrist)		Hand (including wrist)	
Fingers		Truck (Abdomen / Back / Chest / Shoulder)		Throat	
Leg (above ankle)		Foot (incl. ankle)		Toes	
Multiple				Other/specify	

Accident type:

Struck against		Struck by		Fall from Elevation	
Fall on same level		caught in		caught under	
caught in between		Rubbed or abraded		Contact with (Electricity)	
Contact with (Temp./ extremes)		Contact with chemicals oroils		Vehicle accident	
Other/specify					

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FORMAT NO. : HSE-2 REV 0

(Sheet 3 of 3)

Medical Aid provided:-(indicate specific aids / treatment etc.)-

.....

.....

Actions taken to prevent recurrence of similar incident / accident:.....

.....

.....

.....

.....

.....

.....

Intimation to local authorities (Dist. Collector / Local Police Station / ESI authority): Yes / No / NA.

If yes, to whom .....

Safety Officer
(Signature and Name)
Stamp of Contractor

Site Head / Resident Construction Manager
(Signature and Name)

To : Owner
: RCM/Site-in-charge EIL (3 copies)
- Nodal Officer HO through RCM (In case of major accident)
- Divisional Head (Constn) through RCM
- Project Manager, EIL, through RCM

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FORMAT NO. : HSE-3 REV 0

(Sheet 1 of 5)

SUPPLEMENTARY ACCIDENT INVESTIGATION REPORT

TICK THE APPROPRIATE ONEAS APPLICABLE (furnish within 72 hours)

Supplementary to Incident / Accident Report No: _____ (Copy enclosed)

Report No.: _____ **Date**: _____

Project site: _____ **Name of work:** _____

Contractor's name: _____ Contractor's Job Engineer (name) _____

Non-disabling injury (Non-LTI **)**	Hospitalized but resumed duty before end of 48 hrs of accident.	
Disabling injury (other LTI**)**	Hospitalized & failed to resume duty within next 48 hrs.	
Fatal (LTI)	Death / Expiry	
First Aid case	Resume duty after first aid	

Name of the injured: _____ Father's name of victim: _____

Sub Contractor's Name: .....

Gate Pass No.:..... Age: _____Yrs. Victim's medical fitness exam. (Pre-empl.) date: - _____

Date & time of Accident / Incident: _____

Names of Witnesses: (1_____ (2)_____ (3) _____

Profession of victim:

Bar bender		Carpenter		Meson	
Fitter		Helper		Gas cutter	
Grinder		Welder		Electrician	
Driver		Rigger		M/c. operator	
Engineer		Manager		Other/specify	

Qualification

No formal education		Non-Matriculate		Matriculate	
Graduate		Post- grad		Other/specify	

Job Experience

NIL		Less than 2 yrs.		2-5 yrs.	
5-10 yrs.		11-15 yrs.		15 years and above	

Location where the incident happened: _____

_____

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FORMAT NO. : HSE-3 REV 0

(Sheet 2 of 5)

Activity / Works that were continuing during incident / accident: -

Excavation		Demolition		Concrete carrying	
Concrete pouring		Transportation of materials (manually)		Transportation of materials (mechanically)	
Work on or adjacent to water		Work at height (+2.0 mts)		Scaffold preparation	
Scaffold dismantling		Piling works		Welding	
Grinding		Gas-cutting		Pipe fit-ups & fabrication	
Structural fabrications		Machine works		Hydro-testing works	
Electrical works		Erection activities		Other/specify	

What exactly the victim was doing just before the incident / accident? .....

.....

.....

Particular of tools & tackles being used and condition of the same after incident/accident:

.....

.....

Description of Incident/Accident (How the incident was caused) : .....

.....

.....

.....

Nature of injury:

Bruise or Contusion		Abrasion (superficial wound)		Sprains or strains	
Cut or Laceration		Puncture or Open wound		Burn	
Inhalation of toxic or Poisonous fumes or gases		Absorption		Amputation	
Fracture		Other/specify			

Parts of body involved in incident / accident

Head		Face		Eyes	
Throat		Arm (above wrist)		Hand (including wrist)	
Fingers		Truck (Abdomen / Back / Chest / Shoulder)		Throat	
Leg (above ankle)		Foot (incl. ankle)		Toes	
Multiple				Other/specify	

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FORMAT NO. : HSE-3 REV 0

(Sheet 3 of 5)

Accident type:

Struck against		Struck by		Fall from Elevation	
Fall on same level		caught in		caught under	
caught in between		Rubbed or abraded		Contact with (Electricity)	
Contact with (Temp./ extremes)		Contact with chemicals or oils		Vehicle accident	
Other/specify					

Name & Designation of person who provided First-Aid to the victim: _____

Name & Telephone number of Hospital where the victim was treated _____

Mode of transport used for transporting victim – Ambulance / Private car / Tempo / Truck / Others

How much time taken to shift the injured person to Hospital_____

In case of FATAL incident, indicate clearly the BOCW Registration No. of the victim/Company.....
...

Comments of Medical Practitioner, who treated / attended the victim/injured (attached / described here)_____

What actions are taken for investigation of the incident, please indicate clearly – (Video film / Photography / Measurements taken etc. .....)

Immediate cause (Please tick the right applicable) –

Hazardous methods or procedures inadequately guarded		Poor housekeeping		Inadequate or improper PPE	
Environmental hazards (excess noise/ space constraint/ inadequate ventilation		improper illumination/Moving on oval surface		Working on dangerous equipment	

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FORMAT NO.: HSE-3 REV 0

(Sheet 4 of 5)

Failure to secure		Horse-play		Failure to use PPE	
Inattention to surroundings		Improper use of hands & body-parts		By-passing safety devices	
Unsafe mixing or placement of tools & tackles		Bypassing standard procedures		Failure in communication	
Operating without authority		Improper use of equipment or tools & tackles		drug or alcoholic influence	
excessive haste		Others(specify)			

Basic cause

Over confidence		Impulsiveness		over-exertion	
Faulty judgement or poor understanding		Failing to keep attention constantly		Nervousness & Fear	
Fatigue		Defective vision		Ill health or sickness	
Slow reaction		Others(specify)			

Root cause

Inadequate Engg.		Improper Design		Inadequate Planning & organization	
Inadequate knowledge		Inadequate skill		Inadequate training	
Inadequate supervision		Improper work procedure		Inadequate compliance with standard	
Substandard performance		Inadequate maintenance		Improper inspection	
Others(specify)					

Loss of man days and impact on site works, (if any) –

Remarks from Contractor's Safety Officer/ Engineer –

Was the victim performing relevant tasks for which he was engaged /employed? Yes / No
Was the Supervisor present on work-site during the incident? Yes / No
Have the causes of incident rightly identified? Yes / No
Cause of Accident was_____

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FORMAT NO. : HSE-3 REV 0

(Sheet 5 of 5)

Remedial measures recommended by **Safety Officer of Contractor** for avoiding similar incident in future

: .....

.....

.....

.....

.....

.....

.....

Intimation to local authorities (Dist. Collector / Local Police Station / ESI authority): Yes / No / NA.

If yes, to whom .....

Safety Officer
(Signature and Name)

Site Head / Resident Construction Manager
(Signature and Name)
Stamp of Contractor

To : Owner
: RCM/ Site-in-charge of EIL (3 copies)
Nodal Officer HO through RCM (In case of major accident)
Divisional Head (Constn.) through RCM
Project Manager EIL, through RCM

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FORMAT NO. : HSE-4 REV 0

NEAR MISS INCIDENT/ DANGEROUS OCCURRENCE REPORTPROFORMA

(to be submitted within 24 hours)

Report No.: _____

Name of Site: _____ Date: _____

Name of work: _____ Contractor: _____

Incident reported by :

Date & Time of Incident :

Location :

Brief description of incident

Probable cause of incident

Suggested corrective action

Steps taken to avoid recurrence Yes ☐ No ☐

Safety Officer
(Signature and Name)
Stamp of Contractor

Site Head / Resident Construction Manager
(Signature and Name)

Note:

- **Near Miss:** Human injury escaped & no damage to property, equipmentor interruption to work.
- **Dangerous Occurrence**: Occurrences as mentioned below shall be considered as "Dangerous occurrences"

a. collapse or failure of lifting appliances or hoist or conveyors or other similar equipment for handling building or construction material or breakage or failure of rope, chain or loose gears; overturning of cranes used in building or other construction work; falling of objects from height;
b. collapse or subsidence of soil, any wall, floor, gallery, roof or any other part of any structure, platform, staging, scaffolding or any means of access including formwork;
c. collapse of transmission tower;
d. fire and explosion causing damage to property at Construction site.
e. spillage or leakage of hazardous substances and damage to their container;
f. Collapse, capsizing, toppling or collision of transport equipment;
g. Leakage or release of harmful toxic gases at the construction site.

To :Owner
:RCM/Site-in-charge EIL (3 copies)

Divisional Head (Const.) through RCM
Project Manager EIL, through RCM
} (Applicable for Dangerous Occurrence only)

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FORMAT NO. : HSE-5 REV 0

MONTHLY HEALTH, SAFETY &ENVIRONMENTAL (HSE) REPORT

(To be submitted by each Contractor)

Actual work start Date: _____ For the Month of: _____

Project: _____ Report No: _____

Name of the Contractor: _____ Status as on: _____

Name of Work: _____ Job No : _____

(Contractor in consultation with EIL shall generate the reports through web basedpackage (www3.eil.co.in/eilhse)only.

ITEM		UPTO PREVIOUS MONTH	THIS MONTH	CUMULATIVE
1) Average number of Staff & Workmen (average daily headcount, not man days)				
2)Total Man-hours worked				
3) Number of site personnel undergone HSE Induction				
4) Number of HSE meetings organized at site				
5) Number of HSE awareness programmes conducted at site				
6) Number of Tool Box Talks conducted				
7) Number of Loss Time Injuries (LTI)	Fatalities			
	Other LTI			
8) Number of Non disabling injury (Non-LTI)				
9) Number of First Aid Cases				
10) Number of Near Miss Incidents				
11) Number of Dangerous Occurrences				
12) No. of unsafe acts/ practices detected				
13) No. of disciplinary actions taken against staff/ workmen				
14) Man-days lost due to injury				
15) LTI Free man-hours i.e. LTI free man-hours counted from the Last LTI (enter date: .....)				
16) Frequency Rate (No. of reportable LTI per 10lacs man-hours worked)				
17) Severity Rate (No. of man days lost due to LTI per 10lacs man-hours worked)				
18) No. of activities for which HIRAC Completed				
19) No. of incentives/ awards given				
20) No. of occasions on which penalty imposed by EIL/ Owner				
21) No. of Audits conducted				
22) No. of pending NCs in above Audits				
23) Compensation cases raised with Insurance				
24) Compensation cases resolved and paid to workmen				
25) No of Vehicular Accident cases				
26) No of fire/Explosion cases				

27) Whether workmen compensation policy taken			Yes		No
28) Whether workmen compensation policy is valid			Yes		No
29) Whether workmen registered under ESI Act, as applicable			Yes		No
30) Whether HIRAC Register prepared and updated			Yes		No
31) Whether Environment Aspect Impact Register prepared and updated			Yes		No
32) Whether Legal Register prepared and updated			Yes		No
Remarks, if any					

Date:

Prepared by Safety Officer Approved by Site Head / Resident Construction Manager

(Signature and Name)(Signature and Name)

To: -

- RCM EIL

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FORMAT NO. : HSE-6 REV 1

PERMIT FOR WORKING AT HEIGHTS (ABOVE 2.0 METER)

(In duplicate to be issued daily for site and for office)

Permit No…….. Name of Main Contractor……
Name of work executing agency / sub agency / vendor:……..
Date…… Exact Location of work……
Nature of work ……..Duration of work (from) …… (to) ……..
Number of workers covered within this permit……
(*List enclosed with name & gate pass numbers.*)

Sl. No.	Items / Subjects	Status of compliance (Yes / No)	
1	Work areas / Equipment's inspected		
2	Work area cordoned off		
3	Adequate lighting is provided		
4	Precautions against public traffic taken		
5	Concerned persons in & around have been alerted & cautioned		
6	Hazards / risks involved in routine / non-routine task assessed and control measures have been implemented at specific task		
7	ELCB provided for electrical connection & found working		
8	Ladder safely attached / fixed		
9	Scaffoldings are checked and TAGs are found used correctly		
10	Working platforms are provided and are found sound /safe for use		
11	Safe access & egress arrangements (e.g. ladders, fall arresters, life-lines etc.) are satisfactorily incorporated		
12	a. Openings on platform / floors are effectively cordoned / covered		
	b. Safety Nets are provided wherever required		
13	Use of following safety gadgets by people working at area under this permit, is checked and found satisfactory - Safety helmet Safety harness (full body) with double lanyard Safety Shoes Safety gloves Safety goggles		
14	Housekeeping of work area found satisfactorily tidy / clean & clear		
15	Adequate measures have been taken for works being continued at the ground level, when simultaneous works are permitted overhead at that very location.		
16	Materials are not thrown from heights on to ground		
17	Medical examination of workers are made & found satisfactory		
18	Responsible job engineer / supervisor found physically present at work spot for overall administration of work as well as safety of people.		

Above items have been checked & compliance has been found in place. Hence work is permitted to start / continue at the above-mentioned location. Work shall not start till identified lapses are rectified.

Additional Precautions, if any ……
……

Work Permit Receiver Verification By Work Permit issuer
Contractor Job Supervisor Contractor Safety Officer Contractor Engineer/RCM

AT THE END OF THE DAY/WORK:
All works at height are completed & workmen have returned safely from work location at (time)…….. (date)……

(Sig. Contractor Engineer)

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FORMAT NO. : HSE-7 REV 1

CONFINED SPACE ENTRY PERMIT

Project site _____ Sr. No. _____
Name of the work _____ Date _____
Name of Contractor _____ Nature of work _____
Exact location of work _____

Safety Requirements POSITIVE ISOLATION OF THE VESSEL IS MANDATORY

(A) Has the equipment been ?

Y	NR		Y	NR		Y	NR	
☐	☐	Isolated from power/steam/air	☐	☐	water flushed &/or steamed	☐	☐	radiation sources removed
☐	☐	isolated from liquid or gases	☐	☐	Man ways open & ventilated	☐	☐	proper lighting provided
☐	☐	depressurized &/or drained	☐	☐	cont. inert gas flow arranged	☐	☐	
☐	☐	blanked/ blinded/ disconnected	☐	☐	adequately cooled	☐	☐	

(B) Expected Residual Hazards

☐	☐	lack of O_2	☐	☐	combustible gas/ liquid	☐	☐	H_2S / toxic gases
☐	☐	corrosive chemicals	☐	☐	pyrophoric iron / scales	☐	☐	electricity / static
☐	☐	heat/ steam / frost	☐	☐	high humidity	☐	☐	ionizing radiation
☐	☐		☐	☐		☐	☐	

(C) Protection Measures

☐	☐	gloves	☐	☐	ear plug / muff	☐	☐	goggles / face shield
☐	☐	protective clothing	☐	☐	dust / gas / air line mask	☐	☐	personal gas alarm
☐	☐	grounded air duct/blower /AC	☐	☐	attendant with SCBA/air mask	☐	☐	rescue equipment/team
☐	☐	Fire fighting arrangements	☐	☐	safety harness & lifeline	☐	☐	communication equipment
☐	☐		☐	☐		☐	☐	

Authorization / Renewal (It is safe to enter the confined space)

	No. of persons allowed	Name of persons allowed	Signature			Time		Signature
			Work Permit Receiver(Contractor Supervisor)	Verification by Contractor Safety officer	Work permit issuer Contractor Engineer/RCM	From	To	Workman

Permit Closure :

(A) Entry ☐ was closed ☐ stopped ☐ will continue on ...

(B) ☐ Site left in a safe condition ☐ Housekeeping done

(C) Multi lock ☐ removed ☐ key transferred

☐ Ensured all men have come out ☐ Man-ways barricaded

Remarks, if any:

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FORMAT NO. : HSE-8 REV 0

RADIATION WORK PERMIT

Project :
Name of the work :
Name of site contractor :

Sr. No. :
Date :
Job No. :

Location of work :

Source strength :

Cordoned distance (m) :

Name of Radiography agency :

Approved by Owner/EIL ☐

No. of workers engaged :
(List enclosed with name & gate pass numbers.)

The following items have been checked &compliance shall be ensured during currency of the permit:

S. No.	Item description	Done
	Safety regulations as per BARC/AERB ensured while source in use/in transit & during storage	
	Area cordoned off / safe working platform provided	
	Lighting arrangements for working during nights ensured	
	Warning signs/ flash lights installed	
	Cold work permit taken (if applicable)	
	PPEs like film badges, dosimeters used	

Additional precautions, if any _____

(Radiography Agency's BARC/AERB authorized Supervisor)

Permission is granted.

Permit is valid from _____ AM/PM _____ Date to _____ AM/PM _____ Date

(Signature of permit issuing authority-RCM of contractor)
Name : Designation: Date:

Permit renewal:

Permit extended up to		Additional precautions required, if any	Sign of issuing authority with date (of site contractor)	
Date	Time			

Work completed/ stopped/ area cleared at _____ Hrs of Date _____
(Sign. of permit issuing authority)
Name& Signature of site contractor:

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FORMAT NO. : HSE-9 REV 1

DEMOLISHING/DISMANTLING WORK PERMIT

Project :
Name of the work :
Name of contractor :

Sr.No. :
Date :
Job No. :

Name of sub-contractor :

No. of workers to be engaged:
(List enclosed with name & gate pass numbers.)

Line No./ Equipment No./ Structure to be dismantled :

Location details of dismantling/ demolition with sketch : (clearly indicate the area)

The following items have been checked &compliance shall be ensured during currency of the permit:

S. No.	Item description	Done	Not Applicable
	Services like power, gas supply, water, etc. disconnected	☐	☐
	Dismantling/ Demolishing method reviewed & approved	☐	☐
	Usage of appropriate PPEs ensured	☐	☐
	Precautions taken for neighboring structures	☐	☐
	First-Aid arrangements made	☐	☐
	Fire fighting arrangements ensured	☐	☐
	Precautions taken for blasting	☐	☐

Work Permit Receiver
(Contractor's Supervisor/Engineer)

Verification by Contractor
(Contractor's Safety Officer)

Permission is granted.

(Work Permit issuer-Client)

Name :
Date :

Completion report:

Dismantling/ Demolishing is completed on _____ Date at _____ Hrs.

Materials/ debris transported to identified location ☐ Tagging completed (as applicable) ☐

Services like power, gas supply, water, etc. restored ☐

(Permit issuing authority-Client)

CONTRACTOR's NAME

FORMAT NO. : HSE-10 REV 0

DAILY SAFETY CHECKLIST

(To make use of before start of day's work)

Project :
Name of the work :
Name of contractor :

Sr.No. :
Date :
Job No. :

Description of Job decided to perform : -

- **Use of PPE / Safety Gadgets**

Sl. No	PPEs	Compliance (Yes / No)	Sl. No	PPEs	Compliance (Yes / No)
1	Safety Helmets		6	Face Shield	
2	Safety Shoes		7	Full body harness	
3	Hand Gloves		8	Fall Arrest System	
4	Dust Musk		9	Safety net	
5	Safety Goggles		10	Horizontal life-line made of steel wire, (dia not less than 8.0 mm.)	

(Serial No. 1 & 2 are compulsory for everyone. Specify & ensure use of other safety gadgets as required for the job)

- **Identify following important unsafe conditions: -**

Sl. No	Conditions	Yes / No
1	Access to work site / emergency escape clear	
2	Soil / Loose earth kept away from excavated pit / slope / ladder provided	
3	Electrical wire / welding lead lying entangled on ground / welding m/c. booth accessible	
4	Elevated work platform / open ends are protected	
5	Ground area cordoned off before lifting works or erection at height / ground area checked & cordoned-off before start of height works	
6	Structural members / erected pipes / wooden boards/pieces etc. are safely anchored at heights and are not likely to fall down on people when working beneath	
7	Ladders tied-up on tall steel structures, long before are removed to get rid of their use	
8	Any Other	

- **Indicate actions taken, if status of any of the above items is found "No"**
  .....
  .....
- **Specific Safety guidelines / precautions, if any** (communicated thro' TBT)
  .....
  .....
- **Above conditions and PPE compliances are checked by undersigned and correct status are indicated after verification**

Prepared by
Contractor Site Engineer

Verification By
Contractor Safety Officer

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FORMAT NO. : HSE-11 REV 0

(Sheet 1 of 2)

HOUSEKEEPING ASSESSMENT& COMPLIANCE

Project :
Name of the work :
Name of contractor :
Name of contractor : Fortnightly

Sr.No. :
Date :
Job No. :

Sl. No.	Subjects of Review	Satisfactory/ Yes	Non satisfactory/No	Remarks	Action
1.	Cleanliness at the Main entry / access of site				
2.	Ground condition / floor areas free from water-logging / oil spillage				
3.	Ground & elevated floors free from rubbish / wastes / accumulated debris / scraps.				
4.	Manholes / openings are covered / fenced				
5.	Trenches are barricaded / walkways are in place				
6.	Drains are cleaned / not choked / not occupied by dumped materials				
7.	Sufficient CAUTION boards / instructions displayed				
8.	Construction machinery are maintained & parked in orderly manner.				
9.	Movement of site people are not obstructed because of dumping / storing of construction materials				
10.	Access / egress to Electrical Distribution Boards / Panels clear from wires / cables / earth-strips etc.				
11.	Electrical panel rooms / sheds / MCC / Control rooms / Substations etc. are clean & tidy and not used for storing dress / clothes, tiffin-box or bicycles.				
12.	Passage behind Elec. panels are free for access				
13.	Fire extinguishers / fire-buckets are accessible without any difficulty.				
14.	Stair-steps, platforms & landings are clear & tidy				
15.	Sheds / rooms & work areas have got sufficient illumination as well as ventilation				
16.	Cables / Wires / welding leads are routed / hanged appropriately & are not creating unsafe condition.				
17.	Stacking / storing of insulation materials or their packing.				
18.	Removal or cleanliness of left-over sand, concrete, brick-bats, insulation-materials, excess earth, wastes etc.				
19.	Storing / stacking of sand, metal chips, re-bars, steel pipes, valves, fittings etc.				
20.	One escape route at ground & minimum two escape routes at elevation available,				

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FORMAT NO. : HSE-11 REV 0

(Sheet 2 of 2)

Sl. No.	Subjects of Review	Satisfactory/ Yes	Non satisfactory/No	Remarks	Action
21.	Captions / Posters / Slogans on various safety instructions are displayed legibly in local language				
22.	Cable trenches are water-free or regular arrangement for taking out accumulated water exists.				
23.	Windows of rooms / offices are regularly cleaned				
24.	Facilities for cycle sheds, drinking water, washing, rest-rooms etc. are maintained in tidy manner.				
25.	Toilet, Urinals, Canteen / kitchen / pantry etc. are maintained & free from obnoxious smell.				
26.	Construction tools / tackles are stored systematically - the items are tagged / tested / certified by competent third party.				
27.	Sufficient numbers of Dust-bins / Waste-bins found at site and are regularly emptied.				

Additional remarks, if any -

.....

.....

.....

Inspected by
Contractor Engineer

Verification By
Contractor Safety Officer

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FORMAT NO. : HSE-12 REV 0

INSPECTION OF TEMPORARY ELECTRICAL BOOTH / INSTALLATION

Project :
Name of the work :
Name of contractor :
Sub Station No:/Booth No

Sr.No. :
Date :
Job No. :
Location:

SL NO	SUBJECTS	OBSERVATION (YES /NO)	ACTION TAKEN
1	Switchboards installed properly are in order and protected from rain & water-logging.		
2	Adequate illumination provided for switchboard operation during night hours & the lamps are protected from direct human contact.		
3	Voltage ratings, DANGER signs, Shock-Treatment-Chart displayed in the installation / booth		
4	Fire extinguisher (DCP or CO_2) & Sand Bucket kept in close vicinity of Switchboards		
5	Valid License & Competent Electrician / Wireman available & name/ license no. displayed at booth / installation.		
6	General housekeeping in & around booth / installation found in order.		
7	Cable-route-markers for U/G cables provided.		
8	Monthly inspection report of Electrical hand tools available in booth / installation.		
9	Electrical Panel door to be in closed condition and Insulated Mat to be provided in front of panel.		
10	Rubber hand gloves available/ used by Electricians		
11	Availability of CAUTION boards for shutdown & / or repairing works.		
12	All incoming & outgoing feeders have proper MCCB / HRC fuses / Switches.		
13	Switchboards "earthed" at two distinctly isolated locations.		
14	Switchboards have adequate operating space at the front face & at the rear face too.		
15	All connections provided through 30mA ELCB.		
16	Testing records of all ELCBs available at site		
17	Only industrial type plugs & sockets are used.		
18	Temporary connections are 3-core double insulated & free from cuts & joints and 3rd core is earthed at both ends		
19	Socket boards are properly mounted on stand & protected from water ingress.		
20	Electrical equipments operating above 250V have two earthing / double earthing.		
21	All incoming / outgoing cables are properly glanded& terminated with "lugs".		
22	Switch-boards are of industrial variety / type.		
23	Sketch for installation / connection (SLD) made & pasted& other safety labels/display boards		
24	Labeling of incoming / outgoing feeders made.		
25	All hand lamps are protected from direct contact.		
26	All electrical cable / joints are in safe condition		

Inspected by
Contractor Engineer

Verification By
Contractor Safety Officer

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FORMAT NO. : HSE-13 REV 0

(Sheet 1 of 2)

INSPECTION FOR SCAFFOLDING

Project :
Name of the work :
Name of contractor :

Sr.No. :
Date :
Job No. :

Sl. No	Description	Yes	No	N.A.	Actions taken
1	Whether work permit is obtained to take up work at height above 1.5 Mts?				
2	Whether atmospheric condition is "stormy" or "raining" and works at heights have been permitted?				
3	Whether steel pipes scaffoldings are used for units /off-site areas?				
4	Whether scaffolding has been erected on rigid/firm/leveled surfaces / ground? Whether "foot-seals" or "base-plates" are used beneath the up-rights (vertical steel pipes)				
5	Whether scaffold construction is as per IS specification with toe-board and hand-rails (top-rail as well as mid-rail)?				
6	Whether distance between two successive up-rights are less than 2.5 Mts (height of scaffold & load carrying capacity governs the distance between two uprights)				
7	Whether all uprights are extended at least 900 mm above the top most working platform (to enable fitting of handrails)?				
8	Whether vertical distance of two successive ledgers is satisfactory? (*varying between 1.3 Mts. To 2.1 Mts)*				
9	Whether the peripheral areas of working at height are cordoned-off? (for avoiding accident to people arising out of dropped / deflected materials)				
10	Whether platform is provided? Is it safely approachable?				
11	Whether end of scaffold platform / board are extended beyond transoms? (125mm to 150 mm)				
12	Whether CE / IS approved quality and worthy conditioned full-body safety harness (with double lanyard & karabiners) are used while working at heights?				
13	Whether life-line of safety harness is anchored to an independent secured support capable of withstanding load of a falling person?				
14	Whether the area around the scaffold is cordoned off to prohibit the entry of unauthorized person / vehicle?				
15	Whether clamps used are of good condition, of adequate strength and free from defects?				
16	Whether ladder is placed at secured and leveled surface?				
17	Whether water-pass and oil-spills are avoided around the scaffold structure?				
18	Whether ladder is extended 1.5mts. above the landing point at height?				
19	Whether more than one access/egress provided to the scaffold?				
20	Whether ladder used are of adequate length and overlapping of short ladders avoided?				
21	Whether metallic ladders are placed much away from near-by electrical transmission line?				
22	Whether rungs of ladder are inspected and found in good order?				
23	Whether fall-arresters provided on both the access/egress routes?				
24	Whether diagonal (cross) bracings are provided at regular interval on the scaffold?				
25	Whether working platform on the scaffold has been made free from "jolt" or "gap"?				
26	Whether tools or materials are removed after completion of the day's job at heights?				
27	Whether a valid Permit for Work (PFW) is obtained before taking up work over asbestos or fragile roof?				
28	Whether sufficient precaution is taken while working on fragile roof?				

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FORMAT NO. : HSE-13 REV 0

(Sheet 2 of 2)

Sl. No	Description	Yes	No	N. A	Actions taken
29	Whether provision is made to arrange duck ladder, crawling board for working on fragile roof?				
30	Whether scaffold has been inspected by qualified civil engineers prior to their use?				
31	Whether the scaffolding has been designed for the load to be borne by the same?				
32	Whether the erection and dismantling of the scaffolding is being done by trained persons and under adequate supervision?				
33	Whether safety net with proper working arrangement and life-line has been provided?				
34	Whether TAGS (Green for acceptable and Red for incomplete/unsafe scaffolds) are used on scaffolds?				
35	Whether sufficient illumination is provided in and around the scaffold and access?				
36	Whether emergency rescue / response arrangements are made in place				

Inspected by
Contractor Engineer

Verification By
Contractor Safety Officer

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FORMAT NO. : HSE-14 REV 1

(sheet 1 of 2)

PERMIT FOR ERECTION / MODIFICATION & DISMANTLING OFSCAFFOLDING

Project :
Name of the work :
Name of contractor :
Nature of activities :

Sr.No. :
Date :
Job No. :
Duration: From.....To.....

SL. No.	SUBJECTS / ITEMS	DONE	NOT DONE	REMARKS
1	Specific task of Erection / Modification / Dismantling of scaffolds, identified & TAGGED accordingly (before as well as after carrying-out jobs).			
2	People engaged in doing the job are identified & are certified by Job Engineer of Main Contractor as experienced / trained.			Names to be noted
3	Concerned persons are alerted by the Job Engineer of Main Contractor in connection with possible hazards & what the workmen MUST do / MUST not do.			
4	Verification by Job Engineer of Main Contractor made for confirming that all persons permitted to carry-out the jobs are making use of Helmet, Safety Shoes, Goggles, Gloves & Double lanyard safety harness and other relevant PPEs.			
5	Area of work is effectively cordoned-off / barricaded / illuminated.			
6	For taking-up / lowering down Scaffolding members / clamps / couplings etc. appropriate ropes / pulleys/ chains etc. have been arranged for use (not to throw any item) & the same have been verified as "fit for purpose".			
7	Items / members of scaffold, being lowered are removed from the area & stacked correctly.			
8	Ropes, chains, pulley blocks etc. being used for lifting or lowering scaffold items, are inspected by the Job Engineer & their certifications as well as physical conditions have been found O.K. before signing this PERMIT.			
9	Safety Net / Life-line / Fall Arresters etc. are arranged in position and Job Engineer has found working conditions favorable for activities to start.			
10	Scaffold erection or dismantling tasks are being supervised by Experienced Engineer / Competent person.			
11	Only competent & experienced people have been selected / engaged in Scaffolding erection, modification or dismantling tasks.			
12	Adequate & effective actions for traffic and movement of people around the cordoned-off area taken to avoid inadvertent incident			
13	Working platforms are protected with handrails & toe-boards.			
14	Access & Exit (for reach & escape) are safe for use by people.			
15	Tools, tackles to be used for above jobs are verified by job Engineers of Main contractor as genuinely good and tied-up at height (to prevent their fall).			
16	Site important Telephone Nos. are made known to everyone			
17	SOP (Safe Operating Procedure) for the specific task is made & followed too.			
18	Emergency vehicle has been arranged at work locations.			

- This permit for work shall be available at specific work location all the time.
- After completion of work, permit shall be returned to safety cell of main contractor, without fail.
- This Permit shall be issued maximum upto (Monday to Sunday).
- Additional Precautions, if any

  .....
- **ACCORD OF PERMISSION** (to be ticked) - **YES** ( )/ NO ( )

  Work Permit Receiver Verification By Work Permit issuer Contractor Job Supervisor
  Contractor Safety Officer Contractor Engineer/RCM

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FORMAT NO. : HSE-14 REV 1

(sheet 2of 2)

Everyday Site working conditions & performance of workmen shall be assessed / checked by Contractor Site Engr. and Safety Officer shall verify the same.

	Name / Sign.	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
Site Engr.								
Safety Off.								

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FORMAT NO. : HSE-15 REV 1

PERMIT FOR HEAVY LIFT/CRITICAL ERECTION

Project :
Name of the work :
Name of contractor :
Nature of activities :
Location of work :
Equipment/Structure to be erected:

Sr. No. :
Date :
Job No. :
Duration: From.....To.....
Name /Type of crane :
Wt. of equipment/ structure to be erected

SL. NO.	Description of Item	COMPLIANCE STATUS			Remarks
		Yes	No	Not applicable	
1)	Is the crane type suitable for lift or as per erection procedure?				
2)	Is the crane have the correct number of counterweights fitted?				
3)	Availability of Load Certification of crane from authorized agency.				
4)	Is the load chart of crane available in carne cabin/or with Crane operator?				
5)	Is the device to check the Wind speed in crane is working? Is the safety features in crane are working?				
6)	Availability of Load certification of slings and other accessories from authorized agency				
7)	Availability of Licensee/certificate for crane operator from authorized agency.				
8)	Availability of approved HIRAC for the subject activities.				
9)	Availability of approved erection/rigging procedures.				
10)	Availability of temporary gratings/ platforms for critical lifting(as applicable)				
11)	Tool Box conducted before erection?				
12)	Has the area been cordoned off?				
13)	Are the authorized persons during erection are identified?				
14)	Does each person identified for erection understand their roles and responsibilities?				
15)	Is the ground on which crane will rest or outrigger support are correct?				
16)	Is hard stand requirement (if any) complied?				
17)	Is the communication system (viz walkie-talkies, etc. are working properly?				
18)	If more than one crane is lifting the load, is an Intermediate rigger will supervise the lift?				
19)	If there is other obstruction within the operating radius of the crane, have correct precautions been taken to prevent collision?				
20)	All the persons are wearing the requisite PPE?				

Work Permit Receiver Verification By Work Permit issuer Contractor Job Supervisor
Contractor Safety Officer Contractor Engineer/RCM

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FORMAT NO. : HSE-16 REV 1

PERMIT FOR ENERGY ISOLATION & DE-ISOLATION

Project :
Name of the work :
Name of contractor :

Sr.No. :
Date :
Job No. :

ENERGY ISOLATION PERMIT

- Clearance required from:.....Hrs .....Date To .....Hrs ....Date
- Name of equipment/ energy source etc. .....
- Nature of job to be done: .....
- Area.....Location:.....

PERMIT VALIDATION	PERFORMING AUTHORITY
I hereby authorize the .....personnel(performer) to isolate the above equipment/energy source from all sources of power and handover the equipment/energy source for maintenance/repair. Issuing authority Client/Contractor RCM (as applicable) Signature: Date: Name:	The work and precautions will be carried out under my overall responsibility.(Testing/execution engineer) Signature: Date: Name:

SAFETY PRECAUTIONS FOR CLEARANCE	NORMALISING AFTER CLEARANCE
1. Notify workers of intent to de- energize ☐ 2. Obtain lock, tag or locking/tagging devices ☐ 3. Shut down, de-energize, dissipate any residual energies. ☐ 4. Apply lock ,tag and locking and/or tagging devices ☐ 5. *Any other job specific precautions ☐ 6. Verify effectiveness of lockout by attempting to restart. ☐ 7. Proper PPE is ensured ☐ I certify that the energy source mentioned above is isolated from all sources and is safe to start the work. Tag No:..... Lock No:..... Issuing authority Client/Contractor RCM (as applicable) Signature: Date: Name: **(*to be included by contractor in consultation with issuing authority)**	1. Notify workers of intent to re- energize ☐ 2. Conduct visual inspection to confirm that the danger zone is clear of workers ☐ 3. Conduct visual inspection to confirm that tools ,equipment's danger zone is clear of workers ☐ 4. Reposition the safety devices(interlocks, valves, guards, covers ,sensors, as applicable, etc.) ☐ 5. *Any other job specific normalizing details ☐ 6. Remove lock, tag and locking and/or tagging devices. ☐ 7. Re-energize. ☐ 8. Confirm system is operating properly& safely I certify that the energy source mentioned above is isolated from all sources and is safe to start the work. Tag No:..... Lock No:..... Issuing authority Client/Contractor RCM (as applicable) Signature: Date: Name: **(*to be included by contractor in consultation with issuing authority)**

ENERGY DE-ISOLATION PERMIT

PERMIT VALIDATION	PERFORMING AUTHORITY
I hereby authorize the .....personnel(performer) to de- isolate the above equipment/energy source from all sources of power and handover the equipment/energy source for normal operation.. Issuing authority Client/Contractor RCM (as applicable) Signature: Date: Name:	I hereby certify that the equipment/energy source mentioned above has been de-isolated and is ready for normal operation.(Testing/execution engineer) Signature: Date: Name: Countersigned by Issuing authority

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FORMAT NO. : HSE-17 REV 1

PERMIT FOR EXCAVATION (depth 2m and above)

(Sheet 1of 2)

Project :
Name of the work :
Name of contractor :
Job Description :
Size of excavation :

Sr.No. :
Date :
Job No. :
Location:

SL. NO.	Description of Item	COMPLIANCE STATUS			Remarks
		Yes	No	Not applicable	
1)	Suitable and sufficient risk assessments and method statements has been carried to ensure that the work shall be undertaken in accordance with specification and standard.				
2)	Are plans/details of underground services available and the same has been reviewed?				
3)	Has survey done to locate the services/obstacles etc.				
4)	Has the live services (electrical, water line, air line, telephone line, etc)has been disabled for carrying out the job.				
5)	Is adequate barriers/fences to protect the excavation are in place?				
6)	Is Adequate warning signs are in place?				
7)	Is Assessment of ground conditions done and remedial action(if any) taken?				
8)	Safe access / egress (e.g. ramp / steps / ladders etc.) provided for site workmen & supervisors.				
9)	Is the excavation work being undertaken in proximity of structure, etc. ?If Yes, it's effect is considered?				
10)	Availability of competent person for supervising the excavation work?				
11)	Adequate safe arrangement to prevent collapse of edges (e.g. shoring / strutting / benching / sloping etc.) made at site.				
12)	Hard barricades (at least 1.0M away from edge & for excavation near site access roads) with warning signs/caution boards are provided				
13)	Accumulation / passage-ways of water at periphery of excavation / trench stopped/ restricted.				
14)	Is the equipment being used for excavation has been checked for adequacy and is in good working condition having all the safety features?				
15)	Age & fitness of workmen ensured by medical test before engagement in job ?				
16)	Arrangement of Monitoring of possible oxygen deficiency or obnoxious gases done & action taken?				

PERMIT GRANTED - Yes / No

(List enclosed with name & gate pass numbers.)

Name & Signature of Site Engr. Name & Signature of Area – In charge/RCM of Contractor (Receiver) Contractor (Issuer)

Verification by Contractor Safety Officer

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FORMAT NO. : HSE-17 REV 1

PERMIT FOR EXCAVATION

(Sheet 2of 2)

NOTES: -

1. Slopes or benches for excavation beyond 2.0M depth shall be designed & approved by Contractor's site head.
2. Excavated earth to be kept at least 1.5M away from edges
3. Safety helmets, Safety shoes or gum-boots, gloves, goggles, Face shield, Safety Harness shall be essential PPEs.
4. Permit shall be made in **duplicate** and original shall be available at site of work.
5. Permit shall be issued for maximum **one week** only (Monday to Sunday)
6. After completion of works, permit shall be closed & preserved for record purpose

GRANT OF PERMIT AND EXTENSIONS

Sl. No.	Validity period From ____To ____	Working Time From _____To _____	Receiver (site Engr. of Main Contractor)	Issuer(Area In charge/RCM of Main Contractor)	Review by EIL / Owner (Remarks with date
1.					
2.					
3.					
4.					
5.					
6.					
7.					

Additional safety instructions if any: -

1.

2.

3.

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FORMAT NO. : HSE-18 REV 0 **(Sheet 1of 2)**

IDENTIFICATION OF ENVIRONMENTAL ASPECTS, IMPACT ASSESSMENT AND CONTROL MEASURES

S.No	Activity	Environmental Aspect	N/A/E	Environment Impact	Control Measures	Consequences						Risk Level	Significant	Gaps/ Recommendations
						A	B	C	D	E	F	G	Yes/No	

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(Sheet 2 of 2)

INITIAL ENVIRONMENT REVIEW TECHNIQUE

Environmental Impacts	AP = Air Pollution	WP = Water Pollution	LC = Land Contamination	DNR = Depletion of Natural Resources	NP = Noise Pollution

Scale	Quantity (A)	Occurrence (B)	Severity of Impact (C)	Detection (D)	Control (E)	Legal and other requirements (F)
1	Negligible	Very Rare	Negligible visual impact	Immediately	Available & effective at place	In compliance or not applicable
2	Low	Once a month or less	Causes Discomfort or Nuisance	Within 1 hour	Has in-built Secondary control	
3	Moderate	Once a day	Resource Depletion	Within 8 hours	Needs human Intervention	
4	High	Several times a Day	Affects Aquatic Life, flora, fauna or global issue	Within 24 hours	Mechanism in place but not reliable	
5	Excessive	Continuous	Human health effect	More than 24 hours	Absent or no effective control	Not in compliance

Risk Level - G : A x B x C x D x Ex F

Aspects with score of **100 and above** are considered as significant.
Also, Irrespective of the score, all legal noncompliance's to be considered as significant

Condition	
N	NORMAL
A	ABNORMAL
E	EMERGENCY

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FORMAT NO. : HSE-19 REV 0 HIRAC

Risk Identification						Desired Controls & Existing Gaps, If Any		Risk Assessment				Recommended Control Actions To Reduce The Risk Level	Action By	Remarks
SN	Activity	Activity Type (R/NR)	Hazards	Condition(N/AN/E)	Associated Risk	Desired Control Measures	Gaps If Any	Probability(P)	Impact (I)	Risk R= P*I	Risk Classification			

Likelihood – Possibility of occurrence of risks based on present gaps (technological / operational / competence / measurement and monitoring);

UL: Unlikely, **L:** Likely, **VL:** Very Likely, **FR:** Frequent, **C**: Continuous

Impact –

SI: Slight Injury, **MI:** Minor Injury, **MJ:** Major Injury, **SF:** Single Fatality, **MF:** Multiple Fatalities

Level of consequence – Refer Guidance criteria for this i.e. possible degree of damage;

Condition- N: Normal, **AN**: Abnormal, **E**-Emergency

Activity Type: R- Routine, NR- Non Routine

RISK –

L: Low Risk, **M:** Moderate Risk, **H:** High Risk

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FORMAT NO.: **HSE-20 REV 0**

Inspection of Tower Crane

Name of Contractor: **Project:**

Name of Work: **Job No:**

Vehicle Identification/Registration No: **Date:**

Sr. No.	Description	Observation	Remarks & Suggestions
1	Serial number plate &SWL marking		
2	Valid TPI Certificate		
3	Valid Insurance		
4	Safe access and egress are provided to the crane operator.		
5	Front glass of Operator cabin		
6	Operator crane cabin is provided with a locking mechanism so as to prevent unauthorised entry.		
7	A safety bar is fitted across the operator's cabin window where there is likelihood of the operator falling through it.		
8	Manufacturer Operating Manual and Maintenance Manual are made available.		
9	An updated Operation and Maintenance log book is available in the operator cabin.		
10	All mounting bolts are in good condition.		
11	Load chart provided		
12	SLI available		
13	Crane hooks have got smooth surface and no dent		
14	Hook-latch / Dog-clamp in hook is effective		
15	Over hoist limit switch		
16	Double body earthing of Tower Crane		
17	Jib angle indicator is provided (For Luffing Jib Tower Crane).		
18	Emergency stop button, which will terminate the operation of the crane engine, is installed in the operator cabin and correctly identified.		
19	Effective braking mechanisms for Hoisting, Derricking, Slewing, Trolley Travelling maintained:		
20	Trolley Travelling limiter to prevent over-travelling of trolley is functional.		
21	Limit switches to prevent over-derricking and over-lowering of jib (For Luffing Jib Tower Crane) is functional.		
22	Slewing limiter to restrict slewing of crane is functional.		
23	Over load Limiter to prevent overloading of crane is functional.		
24	Load Moment Limiter to prevent over-turning moment is functional.		
25	Anti-collision devices are tested to stop the tower crane's operation such that the crane-to-crane interference must be maintained at not less than 3 m.		
26	Condition of boom		
27	Counter weight placement and pins		
28	Winches, pulleys and wire ropes are in good working condition.		
29	Colour coding		
30	Leakage in hydraulic cylinder		

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31	Fire Extinguisher		
32	Tower crane is adequately grounded or protected against lightning.		
33	Wind anemometer is installed and is in good working condition.		
34	Aviation lamp is functional (Reqd. for 30mt and above)		
35	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
36	Safety Induction for Operator		
37	Others		

Signature & Name of Operator:

Signature and name of Job Engineer

Signature & Name of Contractor's Safety Officer

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FORMAT NO. : HSE-21 REV 0

Crane Inspection Checklist

Name of Contractor: **Project:**

Name of Work: **Job No:**

Vehicle Identification/Registration No: **Date:**

Sr. No.	Description	Observation	Remarks & Suggestions
1	Crane hooks have got smooth surface and no dent		
2	Hook-latch / Dog-clamp in hook is effective		
3	Over hoist limit switch		
4	Over Load Indicator		
5	Over Boom limit switch		
6	Boom angle indicator		
7	Colour coding		
8	Condition of boom		
9	Condition of wire rope		
10	Rope drum / sheaves are in good working condition		
11	Swing break & lock		
12	Swing Alarm		
13	Over hoist break & lock		
14	Boom break & lock (For Telescopic Boom)		
15	Leakage in hydraulic cylinder		
16	Condition of Outrigger (For Tyre Mounted Crane)		
17	Outrigger fully extended Marking (For Tyre Mounted Crane)		
18	Condition of Tyre (For Tyre Mounted Crane)		
19	Wheel chokes are present and are used whenever required (For Tyre mounted)		
20	Battery & lamps		
21	Moving & rotating parts guarded		
22	Load chart provided		
23	Reverse horn (For Tyre Mounted Crane)		
24	Body Condition of crane		
25	Front glass of Operator cabin		
26	Both side Mirror		
27	Number Plate (For Tyre Mounted Crane)		
28	Fire Extinguisher		
29	Horn		
30	Windshield and wipers		
31	Working of light & Indicator		
32	SLI		
33	Spark Arrestor(For Running Refinery/ Petrochemical/Chemical Plant)		

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34	Foot-steps and hand-holds are in good working condition for exit /enter in to cabin		
35	TPI Certificate		
36	RC Document (For Tyre Mounted Crane)		
37	Fitness Certificate of Vehicle by authority		
38	Insurance		
39	PUC		
40	HMV License for Operator		
41	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
42	Safety Induction for Operator		
43	Others		

Signature & Name of Operator:

Signature & Name of Contractor's Concern Engineer

Signature & Name of Contractor's Safety Officer

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FORMAT NO. : HSE-22 REV 0

Hydraulic Mobile Crane- Inspection Checklist

Name of Contractor: **Project:**

Name of Work: **Job No:**

Vehicle Identification/Registration No: **Date:**

Sr. No.	Description	Observation	Remarks & Suggestions
1	Identification number of Hydraulic Mobile crane boldly scribed in front and rear end of machine		
2	Operator has got adequate document in support of his competency (i.e. HMV driving license, knowledge & training)		
3	Marking of SWL on hook position is clearly visible		
4	Test & examination of Hydraulic Mobile crane by statutory / competent authority is carried out & document is valid		
5	Colour Coding		
6	RC Document		
7	Fitness Certificate of Vehicle by authority		
8	Valid Insurance		
9	Valid PUC		
10	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
11	Safety Induction for Operator		
12	Crane hooks have got smooth surface and no dent		
13	Hook-latch / Dog-clamp in hook is effective		
14	Over hoist limit switch		
15	Over Load Indicator		
16	SLI		
17	Condition of boom		
18	Condition of wire rope		
19	Rope drum / sheaves are in good working condition		
20	Leakage in hydraulic cylinder		
21	Tyre condition		

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22	Battery		
23	Moving & rotating parts guarded		
24	Break		
25	Parking Break		
26	Front horn		
27	Reverse horn		
28	Hydraulic Mobile Crane cabin body and frame of machine is in good order		
29	Both side Mirror		
30	Fire Extinguisher		
31	Front glass pane of the Hydraulic Mobile operator's cabin is clean & clear (i.e. not cracked / damaged / broken)		
32	Windshield and wipers condition		
33	Working of front & back lights, turn Indicators, parking lights & fog lamps		
34	Spark Arrestor(For Running Refinery/ Petrochemical/Chemical Plant)		
35	Wheel chokes are present and are used whenever required		
36	Foot-steps and hand-holds are in good working condition for exit /enter in to cabin		
37	Others		

Signature & Name of Operator

Signature & Name of Contractor's Concern Engineer

Signature & Name of Contractor's Safety Officer

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FORMAT NO. : HSE-23 REV 0

Hydraulic Rig Inspection Checklist

Name of Contractor: **Project:**

Name of Work: **Job No:**

Vehicle Identification/Registration No: **Date:**

Sr. No.	Description	Observation	Remarks & Suggestions
1	Control panel is clean & all buttons/switches are clearly visible (no paint over spray, etc.)		
2	All switch & mechanical guards are in good condition and properly installed		
3	All Safety Indicator lights work		
4	Drive controls function properly & accurately labelled (up, down, right, left, forward, back)		
5	Motion alarms are functional		
6	Safety decals are in place and readable		
7	Any defects such as cracked welds, fuel leaks, hydraulic leaks, damaged control cables or wire harness, etc.		
8	Braking devices are operating properly		
9	Winches, pulleys and wire ropes are in good working condition.		
10	Function of interlocks and limit switch		
11	The manufacturer's operations manual (in all languages of the operators)		
12	Oil level, Hydraulic Oil Level, Fuel Level, Coolant Level		
13	Battery Charge		
14	Outriggers in place or functioning. Associated alarms working		
15	Moving & rotating parts guarded		

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16	Load chart provided		
17	Fire Extinguisher		
18	Spark Arrestor, if operated by using fuel(For Running Refinery/ Petrochemical/Chemical Plant)		
19	Serial number plate		
20	SLI		
21	TPI Certificate		
22	Colour Coding		
23	Insurance		
24	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
25	Safety Induction for Operator		
26	Others		

Signature & Name of Operator:

Signature & Name of Contractor's Concern Engineer

Signature & Name of Contractor's Safety Officer

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FORMAT NO. : HSE-24 REV 0

Boom Lift Inspection Checklist

Name of Contractor: **Project:**

Name of Work: **Job No:**

Vehicle Identification/Registration No: **Date:**

Sr. No.	Description	Observation	Remarks & Suggestions
1	Operating and emergency controls are in proper working condition, EMO button or Emergency Stop Device		
2	Functional upper drive control interlock (i.e. foot pedal, spring lock, or two hand controls)		
3	Emergency Lowering function operates properly		
4	Lower operating controls successfully override the upper controls		
5	Both upper and lower controls are adequately protected from inadvertent operation.		
6	Control panel is clean & all buttons/switches are clearly visible (no paint over spray, etc.)		
7	All switch & mechanical guards are in good condition and properly installed		
8	All Safety Indicator lights work		
9	Drive controls function properly & accurately labelled (up, down, right, left, forward, back)		
10	Motion alarms are functional		
11	Safety decals are in place and readable		
12	Guardrails and anchor points are in place, and in good condition		
13	Work platform & extension slides are clean, dry, & clear of debris		
14	Work platform extension slides in and out freely with safety locking pins in place to lock setting on models with extension platforms.		
15	Any defects such as cracked welds, fuel leaks, hydraulic leaks, damaged control cables or wire harness, etc.		
16	Braking devices are operating properly		
17	The manufacturer's operations manual is stored on AWP (in all languages of the operators)		
18	Oil level, Hydraulic Oil Level, Fuel Level, Coolant Level		

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19	Battery Charge		
20	Outriggers in place or functioning. Associated alarms working		
21	Tyres and wheels are in good condition, with adequate air pressure if pneumatic		
22	Wheel chokes are present and are used whenever required		
23	Moving & rotating parts guarded		
24	Load chart provided		
25	Fire Extinguisher		
26	Spark Arrestor, if operated by using fuel(For Running Refinery/ Petrochemical/Chemical Plant)		
27	Serial number plate with Load capacity		
28	TPI Certificate		
29	Colour Coding		
30	Insurance		
31	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
32	Safety Induction for Operator		
33	Others		

Signature & Name of Operator:

Signature & Name of Contractor's Concern Engineer

Signature & Name of Contractor's Safety Officer

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TERMS & CONDITIONS FOR TRAINING OF OWNER PERSONNEL AT VENDOR'S WORKS/ TRAINING FACILITY.

a. Bidder shall quote Training charges of EIL's/Owner's Operation and Maintenance personnel at Bidder's works/training facility on lump sum basis.

b. All expenses including but not limited to Air-fare, Accommodation, local conveyance, living expenses etc of EIL's/Owner's personnel shall be borne by Purchaser.

c. Quoted prices shall be inclusive of all taxes & duties except Goods & Service tax (GST) which shall be payable extra at actuals against submission of documents as per GST rules.

d. A notice period of 15 days will be given by EIL for prior arrangement.

e. PAYMENT TERMS: Refer Annexure-I to SPC.

Bidder's Acceptance:

RFQ No. :

Item :

Offer No. :

Signature with Name & Date and

Seal/Stamp of the Bidder

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
2	20.04.2024	ISSUED FOR COMPLIANCE	DDC	DRC	CGM & HOD (Shipping)
1	10-09-2018	ISSUED FOR COMPLIANCE	DDC	DRC	ED (SCM)
0	05-12-2012	ISSUED FOR COMPLIANCE	DDC	DRC	GM (I)

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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
GR.	-	Goods Receipt
mm	-	Millimetre
MT	-	Metric Ton
NO. / NOS.	-	Number / Numbers
P.O.	-	Purchase Order
RCM	-	Resident Construction Manager

Document drafting Committee Members:

Shri Ashish Mathur, Sr.Manager (SCM-Shipping) 18.4.24

Shri T.Ravi , Sr.Manager (SCM-Shipping) 18.4.24

Shri Kiran Suvarna, Manager (SCM-Shipping) 22/4/24

Document review Committee Members:

Shri Krishna Kumar,Sr.Manager (SCM-(Inspection) 25/05/2024

Shri G.Suresh , C.G.M (SCM-Inspection) 12/6/24

Shri Chandra Shekhar, Sr.G.M (SCM-Inspection) 12/6/24

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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 / Purchase Requisition and are in conflict with this specification, particular instructions mentioned in the individual Purchase Order /Purchase Requisition 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. Supplier shall ensure compliance to the preservation, packing ,marking ,shipping and documentation guidelines specified in this document.

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.

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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 or any other higher duration specified in the PO/PR. 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 it will be suitable for a minimum of 1 year storage or as specified otherwise.

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 & inadequate 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

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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, 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 statutory authorities as applicable, needs to be provided 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 applicable guidelines

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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.. 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 on 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 suitably 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.

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.

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All gasket face of flanges, machined working surfaces and threaded parts of all equipment shall be covered with rust preventive tape or by application of oil based alkyd primers or zinc bases epoxies or thin zinc silicate coatings specially formulated for the preservation of CS and Alloy Steels. 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

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desiccant (with recognized brands / grades) 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, shall be stenciled on two sides and one end marked with 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 remain attached during transit, handling and storage for a minimum period of 12 Months.

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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.

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5.3 Shipping Marks

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

(OWNER)

PROJECT

WITH COMPLETE

ADDRESS

(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, on each packaging in RED colour as follows:

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 from EIL / Owner. Supplier shall ensure dispatch of equipment / materials immediately

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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 and minimum 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 concerned officials of EIL / Client (as specified elsewhere in RFQ/PO).

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 concerned officials of EIL / Client (as specified elsewhere in RFQ/PO).

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, other concerned officials of EIL / Client (as specified elsewhere in RFQ/PO) 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 (as applicable) or forward directly, by Courier the complete set of dispatch Documents to Owner / EIL. as applicable in line with the PO terms & conditions. 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.

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ANNEXURE – XI to SPC

Extract of Insurance Policy

INSURANCE:

1.1 Owner has taken the Marine cum Erection Insurance for NREP Expansion Project for materials and services. Any loss or damage to the materials during ocean transportation, Air transportation, port/ custom clearance, during inland and port handling, inland transportation, storage, erection, final test and commissioning shall be to the account of Contractor, and the Contractor shall be exclusively responsible within the scope of supplies in respect of materials and within the scope of services in respect of works to make good any damage or loss to the materials and works by wayof repairs and/or replacement, as the case may be, pending insurance claim, and no delay shall be made by the Contractor in repair/replacement pending such claim. Owner shall raise the insurance claim in case of damage/ loss to the materials and/or works, and all supporting documents for such claims shall be handed over by the Contractor to the Owner immediately. Contractor shall provide all assistance for such a claim.

1.2 Insurance Policy covers NRL as Principal Owner/beneficiary and its Contractors, sub-contractors as Co-insured.

1.3 The Contractor shall bear the entire cost of arranging all documents/ information, facilitating inspection/ discussions by the officials/surveyors deputed by the Insurer, arranging for any independent expert for his opinion or arrange for testing etc. as required by surveyor/insurance Company. The Contractor shall make all efforts to get settlement of claim at the earliest, and no time extension for completion of work will be given for delay on this account.

1.4 Contractor to ensure that all documents i.e. Invoices, LR/BL or any such documents are endorsed that "**Material is for the consumption and Use for NREP/NRL Project."**

1.5 Owner shall reimburse the actual net amount received towards settlement of subject claim net of deductible as given in para 1.6 below. Owner shall also adjust if claim settlement includes any damage of owner's property or cost and expenses incurred by Owner in repair or reinstatement of damage property under this contract.

1.6 Deductibles to be borne by the Contractor are as follows:

A. For Erection, Testing and Commissioning applicable deductible will be as per table given below:

		Deductible for Original Contract Values (excluding taxes) asdefined below:			
		Up to INR 50 Crs	Above INR 50 Crs and up to INR 500 Crs	Above INR 500 Crs and up to INR 1500 Crs	Above INR 1500 Crs.
Act of God / Natural Catastrophic Perils, Fire & Explosion during Testing & Commissioning, Extended Maintenance, Design Defect.	10% of Claim Amount subject to minimum of	INR 50 Lakhs	INR 75 Lakhs	INR 150 Lakhs	INR 300 Lakhs
All other Perils	10% of Claim Amount subject to minimum of	INR 10 Lakhs	INR 20 Lakhs	INR 45 Lakhs	INR 100 Lakhs

B. (i) For Marine Cover deductible is 0.5% of consignment value subject to minimum of Rs. 500,000 in respect of each and every loss
(ii) For barge movement 0.50% of consignment value subject to minimum of Rs. 7,50,000 in respect of each and every claim

- Excess clause shall be applicable for the respective LSTK/Conventional Contract (s) based on original award/contract value (excluding taxes and duties)

1.7 Sum insured for marine insurance has a Per Conveyance Limit of Rs. 200 crores and Per Location Limit of Rs. 400 crores.

1.8 Contractor shall be solely liable to adhere to the requirements of the Insurer and Principal Insured (Owner) for settlement of claims without prejudice to the rights of Owner /Insurer. During claim, following steps which are not exhaustive are required to be taken care by Contractor:

- Timely information of occurrence of risk event i.e. within 24 hours, for conducting survey.
- Protecting the rights of insurer while issuing acknowledgements
- Lodging of monetary claims in time and furnishing of requisite documents to surveyors/ Insurer.
- Taking necessary precautions so that the loss/damage is not aggravated further.
- Damaged goods to be protected fully.
- Clear the site by dismantling & removing the damaged material to designated locationafter verification & survey by Insurer.

  Any money received by the Owner under any policy or policies of insurance shall be held bythe Owner for proportionate payment to the Contractor in respect of any appropriate repairs undertaken and/or replacement(s) made by the Contractor. Should the Contractor fail to undertake in whole or in part such repairs and/or replacement(s) and other works necessary consequent upon the occurrence of any contingency covered by such insurance, Owner shallbe entitled to get the work done in whole or in part for such repair/replacement through any other agency (ies), without prejudice to any other rights or remedies available to the Owner, at the sole risk & cost of the Contractor.

1.9 Separate insurance policy to the extent of deductibles on account of excess may be arranged by Contractor, if desired, at his own cost.

1.10 Contractor shall at his own cost and expense cover all insurance required under the prevailing statutesfor his personnel and his sub-contractors. This shall include but not be limited to ESIC, Workmen's Compensation & Employer's Liability Policy, Accident or Injury to workmen, etc. as per NRL's GCC.

The Contractor shall take Contractor's All Risk Policy (CAR) to take care of their temporary facility created at site including workers residences, if any, their own construction equipment, tools and testing instrument, site office facility etc.

1.11 Contractor shall at his own cost and expense also obtain suitable insurance policies to cover all third-party liabilities, his vehicles, tools, tackles, construction equipment etc.

1.12 Contractor shall ensure compliance to all other indemnity and insurance as stipulated in theGeneral Conditions of Contract (GCC).

1.13 The following shall be noted with regard to the proposed add-on coverage under MCE Policy for Numaligarh Refinery Expansion Project:-

1.13.1 Major Add-on/condition for Marine coverage is given below:

i) Customs Duty Clause + Additional Customs duty clause (up to INR 30 Crs.)
ii) Concealed damage clause – 90 days
iii) Intermediate Storage – 60 days in addition to duration clause of ICC-A/ITC-A/ICC-A (Air) as per Cargo termination of storage in transit clause (Amended).
iv) Escalation clause- up to 50% for Imports and 30% for Indigenous.

1.13.2 Major Add-on coverage for Erection is given below:-

i) Escalation: up to 10% of the Policy Sum Insured
ii) Expediting Cost Including airfreight and Express Freight: Up to 15% of claim amount maximum Rs. 10 crores AOA and in aggregate
iii) Additional Customs Duty: up to Rs. 15 crores in aggregate
iv) Waiver of Subrogation - against named/additional insured only
v) Owner's surrounding property- MR 119: Owners surrounding property up to Rs. 20 crores AOA and in aggregate.
vi) Offsite storage/fabrication/modification, and/or any work related to the project anywhere in India - MR 013: Offsite storage including at fabricators premises, 50-year return period, Limit Rs. 10 crores AOA and Rs. 25 in aggregate
vii) 72 Hours Clause
viii) Loss minimization cover - Aggregate Amount of Rs. 10 crores
ix) Automatic reinstatement clause for up to Rs. 50 crores in aggregate
x) 50/50 clause
xi) Third party Liability for AOA Rs. 50 Crores and in aggregate: Rs. 100 Crores
xii) MR 001: Riot, Strike and Malicious Damage: Limit INR 500,000,000 in aggregate- all losses linked to communicable disease would be excluded under this extension as well.
xiii) Cover for Earthquake (Fire & Shock), Volcanism, tsunami, storm, cyclone, flood, inundation, landslide (and other AOG Perils)
xiv) Cover for loss or damage due to Strike, Riot and civil commotion (SRCC) and Earthquake
xv) Extended Maintenance Cover up to 12 months
xvi) Design Defect LEG2/96
xvii) Warranted that any river crossing for pipeline works to be done during dry season (October – April) – this is a pre-requisite for any claims to be indemnifiable.
xviii) MR 219: Horizontal Directional Drilling, Limit Rs. 15 crores AOA and Rs. 25 crores in aggregate

1.14 Terrorism coverage:

Terrorism coverage shall be provided under a separate Insurance Policy by NRL.

Extract of NREP Project Insurance Policy:

1.0 RISK COVERAGES AND TERMS AND CONDITIONS:

1.1 Erection All Risk, ALOP & Third Party Liability (Schedule A)

1.1.1 TYPE	Erection All Risks (EAR), ALOP & Third Party Liability as more fully defined in the Original Policy Wording.
1.1.2 INSURED	**Owner/Principal:** Numaligarh Refinery Limited **Additional Insured:** Project Management Consultants and/or Engineering Contractors and/or Construction Contractors and/or Licensor and any other company, firm, person orparty (including but not limited to Contractors and Sub-Contractors of any tier and/or Works Contracts) with whom the Named Insured(s) above, or in this paragraph have, or in the past had, entered into written agreement(s) in connection with the Project, and/or any works activities, and preparations connected therewith. Consultants for manufacturers, suppliers, vendors, architect &/or the Independent Engineers/Consultants and/or consulting engineers and/or servants or agents acting on their behalf, in connection with the project. Including all other Banks, Financial Institutions and other consortium Lenders: For their respective rights and interest.
1.1.3 PERIOD	**Tentative months:** Forty Three (43) months starting from the policy effective date estimated to be from 1st May 2021 or actual date of policy effective date inclusiveof estimated Four (4) months of testing period.
1.1.4 PROJECT WORKS DESCRIPTION	Design, engineering, manufacture procurement, supply, delivery, erection, construction, installation, testing, commissioning, start-up and maintenance of theNREP.
1.1.5 LOCATION OF RISKS:	Numaligarh Refinery Limited, Pankagrant Village, Golaghat District, Assam forthe main plant and all other locations of NREP including various offsite storage and fabrication sites of NRL/contractors/sub-contractors whether owned or leasedincluding cross country pipe line project work.
1.1.6 INTEREST	**Section I – Material Damage** The permanent and temporary works, materials, site accommodation and/orcontents, construction plant, tools and equipment, survey and other instruments including site accommodation and/or contents, and/or for and/or other property used or for use in connection with the Project, along with demolition works as may be relevant, that the Insured own or that for which he is responsible and start-up ofproject and/or all other associated ancillary works and/or works outside the plot boundary and/or including all existing works as on the effective date of insurancepolicy, including loss of Feed stock and utilities for any loss during pre- commissioning and testing. **Section II – ALOP (Advance Loss of Gross Profit)** Indemnity period 12 months **Section III- Third Party Liability** Covering all locations, as given under clause 4.1.5 above.

<table>
<tr><td rowspan="9">1.1.7 TOTAL SUM INSURED:</td><td colspan="2">The “Sum to be Insured” is the COMPLETELY ERECTED COST OF THE PROJECT including all cost of the goods/Plants/Machinery/Equipment/Other materials and consumables including taxes and duties.

<u>Sum Insured: (NREP Refinery including HGU BOO and Pipeline including COIT BOOT)</u>

Section I: (Including taxes & duties, refer Annexure-I – Project Detail)</td></tr>
<tr><td>Sum Insured: Imported and Indigenous P&M, including civilworks of all kinds (A + B).</td><td>INR Crs</td></tr>
<tr><td>(A) Cost of Imported Equipment Including Freight, Customduty and GST</td><td>INR Crs</td></tr>
<tr><td>(B) Balance Cost as above in INR (Including Freight, Taxes,GST etc.)</td><td>INR Crs</td></tr>
<tr><td>Feed Stock & Stock in process (Risk covered should start only 6 months prior to end of the project policy period as defined above)
1) For Testing & Commissioning: Rs. crs
2) Storage & Plant hold up at Refinery site: Rs. crs
3) Storage at COIT: Rs. crs</td><td>INR Crs.</td></tr>
<tr><td>Section II: ALOP for Gross Profit (For Indemnity periodof 12 months)</td><td>INR Crs</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Section III: Third Party Liability</td><td>AOA: INR 50 Crs
In aggregate: INR 100 Crs</td></tr>
<tr><td></td><td></td></tr>
<tr><td>1.1.8 DEDUCTIBLES</td><td colspan="2">1. <u>Refinery Section:</u>
Act of God / Natural Catastrophic Perils, Fire & Explosion during Testing & Commissioning, Extended Maintenance, Design Defect – 10% of Claim AmountSubject to Minimum of INR 125,000,000.
Other Perils – 10% of Claim Amount Subject to Minimum of INR 35,000,000.

(Note: The above deductibles will not be applicable for this Contract. Refer clause 1.6 (A) of Annexure-XXIII (Insurance) for deductibles applicable forthe Contract.)

2. ALOP: Normal- 90 Days, NAT-CAT Perils/Long lead items/Imported items- 120 days.

3. Third Party : PD- 5% of claim amount subject to minimum of INR 1.25 CrBodily injury- NIL

Notes:
1. The excess shall be applicable for Each and Every Loss (EEL).</td></tr>
</table>

1.1.9 Add-on	The Original Policy Conditions and Clauses include, but not limited to: Broadly as per Munich Re's standard Erection All Risks Policy or its equivalentwith the following extensions: 1. MR 001: Riot, Strike and Malicious Damage: Limit INR 500,000,000 in aggregate. All losses linked to communicable disease would be excluded. 2. Cover for Earthquake (Fire & Shock), Volcanism, tsunami, storm, cyclone,flood, inundation, landslide (and other AOG Perils) 3. Waiver of contribution clause 4. MR 004: Extended Maintenance cover for 12 months 5. Third Party Liability including Cross Liability and Liability during extended maintenance – INR 50 Crores 6. Escalation up to 10 % 7. Additional customs duty up to INR 15 Crores in aggregate 8. 72 hours clause 9. Professional fees clause – INR 10 Crores in aggregate 10. Dewatering, clearance and removal of debris including external debris- 10%of the loss amount subject to maximum of INR 100,000,000 AOA & in aggregate. Subject to adequate dewatering pumping capacity to be maintained at all locations where work of more than INR 10 Cr is being executed. Foreign / External Debris Cover Included – INR 20,000,000 within overalllimit of ROD. 11. Extra costs for dismantling, shoring-up, propping and/or protecting insuredproperty whether damaged or not, clearing and repairing drains and servicemains at the site, salvage, fire extinguishing, demolition, removal and disposal(provided this is necessary for completion of repair / reinstatement) – INR 100,000,000 Any One Accident & In Aggregate. 12. 50:50 Clause 13. Loss minimization cover - Aggregate Amount of INR 100,000,000 14. Automatic reinstatement clause for up to INR 500,000,000 in aggregate 15. MR 013: Offsite storage including at fabricators premises, 50-year return period, Limit INR 100,000,000 AOA and INR 250,000,000 in aggregate; 16. Design defect DE-3 for Civil construction and DE-4 for Plant & Machinery(as per LEG2/96) 17. Hydrocarbon processing endorsement – wording as per: MR 204 for Hydrocarbon Processing Industries 1; and MR 205 for Hydrocarbon Processing Industries 2 (upto INR 250,000,000 AOA and in aggregate); 18. Cover for plans and documents – INR 100 lakhs in aggregate 19. MR 218: Leak search cost, INR 50,000,000 aoa and in aggregate, subject to50% of welding seams being x-rayed; 20. Goods held in trust clause (subject to forming part of Section 1 sums insured) 21. Care, custody and control clause (including Goods {other than feedstock, consumables, CPM)} Held in Trust (subject to forming part of Section 1 sums insured) 22. MR 119: Owners surrounding property up to INR 200,000,000 AOA and in aggregate; 23. MR 220: Inland Transit including movement to/from off-site storage spanning over public road in between (Coverage provided for insured's siteswithin 10 KMs range). Per Bottom Limit– INR 250,000,000 Any One Conveyance 24. Multiple Insured and Non Vitiation Clause (LEG Multiple Insured Clause) 25. MR 114: Serial loss - 1st Loss 100% / 2nd loss 80% / 3rd Loss 60% / 4th and subsequent loss: NIL 26. Cover for temporary structure and content. (subject to value of works are included in Section 1 – Material Damage sums insured). 27. Cover for insured contract works taken over or put into use/service (For Permanent Civil Facilities viz. Insured's Office, Permanent Roads & other Civil Buildings within the Project Site) 28. Public Authority Clause - Up to INR 100,000,000 in aggregate. 29. Arbitration clause (Indian arbitration clause) 30. Loss Payee Clause

	31. Payment On Account Clause (upto 50% as per surveyors recommendations) Primary and Non-Contributory Clause 32. Waiver of Subrogation Clause (against named insured) 33. Non-Cancellation clause. 34. Nominated Loss Adjustor's clause (names to be advised by insurance company in their bid document) 35. Sum Insured for the purpose of Value at Risk shall at all-time be considered including full escalation covered under the policy 36. Fragile items cover - Limit Rs. 2 crores in aggregate, if forming part of Section 1 sums insured. 37. Damage due to falling Objects Cover 38. MR 206: Firefighting facilities, Limit INR 100,000,000 per storage unit; 39. MR 120: Vibration, Removal and Weakening of support, Deductible: 25%of the claim minimum INR 40,000,000 each and every loss; 40. Designated property clause 41. Claim preparation clause - Limit Rs. 25 lakhs in aggregate. 42. MR 006: Expediting Cost Including airfreight and Express Freight: Up to15% of claim amount maximum INR 100,000,000 AOA and in aggregate.
1.1.10 **Other Subjectivities**	• Excluding Ex Gratia and without Prejudice settlements • NMA 2919 War & Terrorism Exclusion • NMA 1685: Industry Seepage, Pollution & Contamination Exclusion • NMA 1622: Radioactive Contamination Exclusion; • Cyber Loss Limited Exclusion Clause ~ LMA5410 (amended) • LMA 5062: Fraudulent Claim Clause; • LMA 3333 Reinsurers Liability Several and Not Joint • LMA 3100 Sanctions, Limitations and Exclusion Clause • CL 370 Institute Radioactive Contamination / Chemical Exclusion • CL380 Cyber Attack Exclusion Clause • Political Risk Exclusion Clause • Total Asbestos Exclusion Clause • NMA 1975a Nuclear Energy Risk Exclusion • EPI 58 Mould Exclusion • MR 005: Time schedule, 6 weeks • MR 008: Structures in Earthquake zone; • MR 121: Piling Foundation and retaining wall works; • MRe208- Warranty Concerning Underground Cables and Pipes • MR 209: Crops, Forests and Cultures • MR 217: Special conditions for open trenches during laying of pipelines: 3000 m per section * 16 sections maximum • MR 221: Safety measures with respect to flood and inundation, 50 years return period; • MR 110 - Safety measures w.r.t. precipitation, flood and inundation (50 year return period) • NMA 464 : War and Civil war exclusion clause • Fines & Penalties Exclusion • NMA 2737 Claims Cooperation clause • LMA 5391 Coronavirus Exclusion • LMA 5394 Communicable Disease Endorsement • No losses till confirmation of binding or inception of policy period, whichever is later • Exclusion of Contractors Plant, Machinery and Equipment; • Exclusion of marine liability and any consequential losses thereof • MR 106: Sections, 100 metres per section x 20 sections in aggregate, minimum distance between two sections 500 metres;

	• MR 207: Camps and Stores, 50Y RP and INR 100,000,000 per storage Unit
	• MR 219: Horizontal Directional Drilling, Limit INR 150,000,000 AOA and INR 250,000,000 in aggregate; • MR wet risk clause • Temporary roads put to use will be off cover • Exclusion of tunneling works (not applicable for pipeline project) • Exclusion of SPM and sub-sea pipelines • ALOP Monitoring Agency- Lead Insurer to decide • MR 109: Construction material, 50 years return period; • MR 203: Used machinery; • MR 214: Subsidence; • Any direct and or indirect exposure from Iranian Crude Oil will not be covered; • Exclusion of any loss or damage arising out to prototype and/or second-hand technology; • No cover for Catalyst poisoning; • Warranted that any river crossing for pipeline works to be done during dry season (October – April) – this a pre-requisite for any claims to be indemnifiable; • LMA 5401 Property Cyber and Data Exclusion;

1.2 Marine cum Storage and Marine DSU (Schedule B)

1.2.1 TYPE	Marine cum Storage (including War & SRCC).	
1.2.2 INSURED	Numaligarh Refinery Limited as Owner/Principal and/or; All other suppliers/sub-suppliers, contractors/sub-contractors and works contractors, any tier and any of their subsidiary companies including any other connected party belonging to them, directors, officers, employees of each ofthe above party for their respective rights and interest; Consultants &/or the Independent Engineer and/or servants or agents acting on their behalf. Including all other Banks, Financial Institutions and other consortium Lenders: For their respective rights and interest. But excluding in all cases ship owners and/or vessel owners and/or barge owners and/or ship charterers and /or vessel charterers and /or barge charterers and Freight Forwarders. All for their respective rights and interests.	
1.2.3 PERIOD OF INSURANCE	Always open for all shipments arising from or in connection with the Projectdescribed herein commencing on or date of inception, until the end of the project policy period or upon cancellation by the Named Insured's.	
1.2.4 SUM INSURED (INR)	**Sum Insured:(NREP Refinery including HGU BOO and Pipelineincluding COIT BOOT)**	
	Total Sum Insured as per Annexure I – ProjectDetail {(A) + (B) as bifurcated below}	**INR Crs**
	(A) Imported Material / Equipment	**INR Crs**
	(B) Indigenous Material / Equipment	**INR Crs**
	Marine DSU for indemnity period of 12 months	**INR Crs**

<table>
<tr><td>1.2.5 ABOUT THE PROJECT:</td><td>Project cargo/consignments being all materials, equipment and supplies, whichforms part of NREP

Load Ports: Anywhere in the world

Load Ports for Domestic Supplies: Anywhere in India

Discharge ports: Mainly Ports in West Bengal but also to include Ports inOdisha, and Maharashtra or any other ports in India

Unloading Plans: Details to be made available for critical equipment andODC/OWC cargo, in due course.

Transport Agreements: Contracts to be provided in due course.
.
Barge Transits: Envisaged and hence to be considered for cover.

Voyage: Rail/Road/Air/Water ways (coastal/sea/river)

<table><tr><td>By Rail/Road/Costal Waterways/River/Air</td><td>1. Majority West Bengal Ports/Airports
2. Also Orissa, Tamil Nadu and Mumbai Maharashtra Ports and Airports</td></tr></table></td></tr>
<tr><td>1.2.6 LOCATION OF PROJECT:</td><td>NREP across all locations in India specified in Project Details</td></tr>
<tr><td>1.2.7 INTERESTS/ RISKS INSURED/ MODE OF CONVEYANCE:</td><td>Marine Cargo (ALL RISKS + WAR & SRCC)
Upon all materials (including high sea sales/purchases) including free-issued materials, equipment, plant and machinery, spares, consumables, packingmaterial and all other material / items pertaining to or incidental to/ or inconnection with the project of Refinery and/or associated facilities againstall risks of physical loss or damage while in transit, including loading and unloading activities, by Sea, Coastal transit by barges, and transit by Rail/Road, Air, Courier or Multimodal from country of origin anywhere in the world to the Project Site or designated storage areas in India, or vice versa.

The insurance also cover first loading.

Replacement / Rejected / Return shipment to be held covered as per return /replacement / rejected shipment clause.</td></tr>
<tr><td>1.2.8 LIMITS OF LIABILITY:</td><td>Subject to the following per conveyance limits:
Per Bottom Limit: INR 200 Crs per any one vessel, conveyance. Per Location Limit: INR 400 Crs i.e. twice the Per Bottom Limit.</td></tr>
<tr><td>1.2.10 GENERAL AVERAGE CLAUSE</td><td>This insurance covers general average and salvage charges incurred to avoid or in connection with the avoidance of loss from any cause covered by this Policy and except as specifically excluded, such charges to be adjusted or determined according to the contract of affreightment and/or the governing law and practice (or if there is no contract of affreightment, according to Foreign Statement or York-Antwerp Rules).
For the purpose of claims for general average contributions and salvage charges recoverable hereunder the Insured Property shall be deemed tobe insured for its full contributory value.
General average deposits shall be payable on production of general average deposit receipts.</td></tr>
</table>

1.2.11 PACKING CLAUSE	In the event of a claim being made for loss or damage to the Insured Propertywhich is alleged to be caused by insufficiency or unsuitability of packing orpreparation of the Insured Property, Insurers hereby agree that they will not use such alleged insufficiency or unsuitability as a defense against the claim in any case where the packing or preparation was carried out by a party other than the Named Insured and the insufficiency or unsuitability arose entirely without the Named Insured's privity or knowledge. For the purpose of this clause, "packing" shall be deemed to include stowage in a container and/or other inter-modal method of unit load.
1.2.12 CHOICE OF LAW AND JURISDICTION:	Worldwide
1.2.13 BASIS OF VALUATION:	**Indigenous Equipment:** Ex-works cost including all spares plus taxes and duties plus all actual expenses including but not limited to freight andinsurance till it reaches the site. **Imported Items:** Invoice price plus all actual expenses up to port of landingin India plus duties and taxes including but not limited to freight and insurance,custom duty plus all expenses incurred within the country plus either 5% or actual transportation cost, whichever is higher plus 10%
1.2.14 DEDUCTIBLES:	0.50% of the consignment value subject to a minimum of INR 500,000 in respect of each and every loss. Barge movement 0.50% of consignment valuesubject to minimum of INR 750,000 EEL. NIL Excess for General Average Marine DSU: Waiting Period of 45 days
1.2.15 CONDITIONS:	1. Marine Cargo 2. Institute Cargo Clauses (A) CL382 1/1/09 3. Institute Classification Clause 1.1.01 IACS vessels aged up to 30 yearsheld covered 4. Institute Cargo Clauses (Air; excluding sending's by Post) CL387 1/1/09 5. Institute Strikes Clauses (Cargo) CL386 1/1/09 6. Institute Strikes Clauses (Air Cargo) CL389 1/1/09 7. Institute War Clauses (Cargo) CL385 1/1/09 8. Institute War Clauses (Air Cargo; excluding sending's by Post) CL388 1/1/09 9. Institute War Clauses (sending's by Post) CL390 1/3/09 10. Institute War Cancellation Clause CL359 1/1/95 11. Institute Replacement Clause CL161 1/1/34 12. Institute cyber-attack exclusion clause CL 380 10/11/03 13. Institute War Cancellation Clause (Cargo) CL 14. Institute Theft, Pilferage & Non Delivery Clause CL.272 15. Inland Transit All Risk (version 2010) 16. Institute Radioactive Contamination, Chemical, Biological, Bio-Chemical & electromagnetic Weapons Exclusion on CL370 10.11.03 17. Riots, strike & civil commotion clause (Inland Transit) 18. 50:50 clause 19. Attachment & Termination Clause 20. Buyers Interest Contingency Clause 21. Customs Duty Clause + Additional Customs duty clause (up to INR 30Crs) 22. Concealed damage clause – 90 days 23. Conveyance clause 24. Control of damaged goods clause. 25. Cargo termination of transit clause (Terrorism, JC 2001/056) 26. Civil authority clause 27. Claims Quantum Clause 28. Claused Bill of Lading Admitted

	29. Container clause 30. Container demurrage charge clause 31. Change of Transportation Clause - without the knowledge and/or consentof the insured. 32. Cover for over dimensional/Overweight/Heavy Lift cargo. 33. Debris removal (sublimit - USD 250,000) 34. Diversion clause 35. Deliberate damage - pollution hazard 36. Deliberate damage clause – Customs service 37. Exclusion for Delay under ICC to be carved / bought back in case of delayan act of General Average 38. Export control clause. 39. Errors and Omission clause - Not to apply to critical items 40. Extension of Duration Clause by 60 days at Discharge Port 41. Extension of cover in respect of Damaged Interests 42. Escalation clause- up to 50% for Imports and 30% for Indigenous. 43. Expediting Costs Clause (sublimit -USD 250,000 for each and every loss) 44. Extra Expenses Clause (sublimit -USD 250,000 for each and every loss) 45. Fumigation 46. General note clause 47. Intermediate Storage – 60 days in addition to duration clause of ICC-A/ITC-A/ICC-A (Air) as per Cargo termination of storage in transit clause (Amended). For intermediate storage beyond the above period (Upto 60 days) for ODC/OWC (to be notified to Insurer at least 10 working days in advance), will be available at additional premium rate of 0.05% per month or part thereof, if opted by Insured. 48. Insolvency exclusion clause 49. Import duty and collect freight 50. Inspection of record clause 51. Insurable Interest Clause 52. Jurisdiction Clause 53. Letter of credit clause 54. Loss Payee Clause 55. Multiple Insured's including Non Vitiation Clause Machinery warranty clause 56. Notifications of claims 57. Nomination of Repairers Clause 58. Non delivery losses/missing goods 59. On Deck or under desk shipment 60. Professional Fees 61. Period of 72 hours clause 62. Repacking Unpacking / Deferred Unpacking Clause 63. Return or rejected shipments to be covered 64. Replacement by air 65. Shipping Expenses Clause (sublimit - USD 250,000) 66. Shortage from Trailers and/or Vehicles Clause. 67. Survey fees Clause 68. Stuffing/De-stuffing/re-stuffing at consolidators and/or packers premises 69. Seal Intact Clause 70. Titles of Clauses and Language of Policy 71. Wilful Misconduct 72. Overloading warranty deleted 73. Testing, sorting and segregation clause 74. Marine extension clause 75. Accumulation clause 76. License clause 77. Unseaworthiness and unfitness clause admitted

	78. Surveys and pre-inspections required during loading, unloading or transshipment, for over dimensional or over weight cargo or otherwise, would be minimum and for agreed equipment / material and would be atthe cost of the Insurers 79. Additional expense clause (sublimit - USD 250,000) 80. Delay in opening 81. Work in course of voyage clause
1.2.16 Additional Requirements	• To cover unloading at site including direct unloading onto place of erection from any mode of conveyance. • If there is a claim dispute, a technical consultant would be appointed by Insured and Insurers with mutual agreement. The technical consultant's judgment would be considered final and accepted by both the parties. • Survey Warranty Clause; at cost of Insurers; Survey warranty shall not be mandatory if critical equipment shipped in enclosed containers • Paramount warranty clause • Apportionment of recoveries clause • Joint Insured clause
1.2.17 Additional Conditions	• Cargo ISM Endorsement (JC 98/019 1 May 1998) • Cargo ISM Forwarding Charges Clause (Amended) • Cargo ISPS Endorsement • Cargo ISPS Forwarding Charges Clause (Amended) • Contracts (Rights of Third Parties) ACT 1999 Exclusion Clause (Cargo) • Cutting Clause (where possible) • Delay in Opening/50:50 • Non-Vitiation Clause (in favour of lenders-only) • Primary Insurance Clause • Sanction Limitation and Exclusion Clause (JC2010/014) dated 11/08/10 • Termination of Transit Clause (Terrorism) 2009 • Excluding electrical, electronic and mechanical derangement unless caused bya peril covered under Institute Cargo Clauses (C) CL.384 dated 1.1.09 • Excluding rusting, oxidation and discoloration in respect of unpacked or unprotected property, and/or in respect of all non-containerized items shipped on deck unless caused by a peril covered under Institute Cargo Clauses (C) CL.384 1/1/09 • Excluding damage to linings and/or coatings of pipes unless damaged due to an insured peril. • Excluding loss, damage or expense caused by or resulting from final positioning, installation and/or testing. • Excluding contractor's Plant and Equipment absolutely unless otherwise agreed by Lead Reinsurer. • Excluding second hand equipment, unless otherwise agreed by lead Reinsurer. • Excluding ocean/international barge shipments unless with prior written agreement of Insurer and at additional terms and conditions as would be agreed. • Excluding twisting, bending, scratching of steelwork etc. unless caused by perils insured under Institute Cargo Clauses (B) CL383 dated 1/1/2009 • Communicable Disease Exclusion JC2020-011 dated 17 April 2020".

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ANNEXURE-X

SELF DECLARATION OF CONFLICT OF INTEREST

Job Name: DCU Revamp Project of NRL

Tender No.:

Terms & Conditions in respect of "Conflict of Interest" in the bidding process:-

A bidder shall not have conflict of interest with other bidders. The bidders found to have a conflict of interest shall be disqualified.

A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

a) they have controlling partner(s) in common; or

b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or

c) they have the same legal representative/agent for purposes of this bid; or

d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or

e) bidder participates in more than one bid in this tender. Participation by a bidder in more than one bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid.

f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following:
   1. The principal manufacturer directly or through one Indian agent on his behalf; and [in case of receipt of bids from both the Indian agent & the principal, the principal manufacturer shall be approached to arrange for withdrawal of one of the bids; in case of non-withdrawal, the bid from the principal manufacturer shall be considered]
   2. Indian/foreign agent on behalf of only one principal.

g) a bidder or any of its affiliates provided the consultancy (through another contract) in the preparation of the design or technical specifications of this supply/contract;

h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business.

SELF DECLARATION OF CONFLICT-OF-INTEREST FREE BID

I am / We are participating in this tender (*whole or part of the tender against which separate contracts will be awarded to individual bidders*), taking note of the above terms & conditions and hereby declare that there is no other participating bidder in the same (*whole or part of*

the tender), which may create conflict of interest as described above, to the best of our knowledge and understanding.

I/We understand that in case any conflict of interest is found to have occurred, NRL will disqualify the bids from the bidders deemed to have conflict of interest.

I / We further declare that in case I / We observe that any conflict of interest is found to have occurred after the unpriced bid opening, I / We shall immediately inform NRL in writing regarding such conflict of interest **within 2 days** from unpriced bid opening; and NRL shall have the right to disqualify the bids from the bidders deemed to have conflict of interest.

It is understood that any wrong declaration / non-declaration in this context shall make me / my agency / company liable for further action under Holiday Listing procedure of NRL.

_____

Date: (SIGNATURE OF BIDDER)
Place:

ANNEXURE-XI

Job Name : DCU Revamp Project of NRL

Tender No. :

SELF DECLARATION OF DEBARMENT / BLACKLISTING / HOLIDAY LISTING & ALLIED FIRMS

(1) **SELF DECLARATION OF DEBARMENT / BLACKLISTING / HOLIDAY LISTING**

I/We hereby declare that I am / we are currently not serving any holiday listing/black listing/debarment orders issued by Numaligarh Refinery Limited (NRL) or Ministry of Petroleum & Natural Gas (MoPNG) debarring me/us from participation in tendering or carrying on business dealings with NRL/MOPNG.

I/We understand that bids from the bidders who are on holiday list by NRL or MoPNG will not be considered.

It is understood that any wrong declaration in this context shall make me / my agency / company liable for action under Holiday Listing procedure of NRL.

2) **DECLARATION OF ALLIED FIRMS OF THE BIDDER**

I/We hereby declare that following are my/our allied firm(s) (*as defined in NRL's holiday listing policy*):-

Name(s), PAN and GST number(s) of our allied firms are as follows: -

Sl. No.	Name of Allied Firm	PAN	GSTN

It is understood that in case of debarment of me / my agency / company by NRL, the debarment shall be automatically extended to my/our allied firms.

Date: **(SIGNATURE OF BIDDER)**

Place:

Note: *Please refer NRL's current "Policy for Holiday listing/ Banning/ Debarring of Contractors/ Suppliers" available in NRL website www.nrl.co.in (under "Tenders" section) for details. Bidders are requested to carefully read the said policy which will be applicable for this tender.*

NUMALIGARH REFINERY LIMITED
General Purchase Conditions (Indigenous) - 2024
(Effective from 29.07.2024)

Definition:

1. 'NRL'/'Owner' means 'Numaligarh Refinery Limited'

2. 'Vendor'/'Contractor' means a Person or Firm or Company, to whom the order is addressed, for supply of goods and/or services.

3. Banker: Unless otherwise specified, NRL's banker at Numaligarh shall be: State Bank of India, NR Complex, P.O. NR Project, Pin: 785699, Dist. Golaghat, Assam. Bank Code: 5377.

Unless otherwise specified, the following Terms & Conditions shall be applicable for supply of goods.

1	**Price Basis:**	Prices are to be quoted on FOR NRL Site, Numaligarh basis (or, FOR NRL Guwahati/New Delhi/Calcutta/Siliguri/Paradeep basis, as the case may be) showing break-up of taxes, duties, packing & forwarding, freight, third party inspection (if applicable) and transit insurance charges, (all in % age).
1(A)	**OEM/Authorised Dealer/Agents of Supplier:**	When a bidder sends quotation for an item manufactured by some different company, the bidder is also required to attach, in its quotation, the manufacturer's authorisation certificate and also manufacturer's confirmation of extending the required warranty for that product as per formats given in RFQ/NIT. However, manufacturer's authorisation / confirmation may not be required for Commercially-Off-the-Shelf items, unless specifically mentioned in the RFQ/NIT. In cases where the manufacturer has submitted the bid, the bids of its authorised dealer / distributor / channel partner will not be considered and EMD (if any) will be returned. And in case of violations, both infringing bids will be rejected.
2	**Firm Price:**	Quoted prices shall remain firm and fixed till complete execution of the order. NRL is not liable for any claim from the supplier on account of fresh imposition and/or increase (including statutory increase) in excise duty, custom duty, GST, and any other tax, duty or other levy on raw materials and/or components used directly in the manufacture of the contracted goods taking place during the pendency of the contract, unless such liability is specifically agreed to in terms of the contract.
2(A)	**Suo motu discounts and rebates after opening of the tender:**	If a bidder offers suo motu discounts and rebates after opening of the tender (techno-commercial or financial), such rebates/discounts shall not be considered for the purpose of ranking the offer but if such a firm does become L1 at its original offer, such suo motu rebates will be incorporated in the contracts by NRL.
3	**Payment Term:**	Unless otherwise specified/agreed, the payment term shall be "100% within 30 days of receipt and acceptance of goods at site subject to submission of Contract Performance Security (CPS) and Warranty Bank Guarantee (WBG), as applicable.
4	**Weights & Measurements:**	All weights and measurements recorded by NRL on receipt of materials shall be treated as final and binding. Qty. Tolerance @±0.05% (up to 20 MT) and Tolerance @± 0.03% (beyond 20 MT) for weigh bridge scale variation (Class- III) shall be permissible.
5	**Qty. Tolerance:**	For items like Structural Steel, Plates, Tor Steel, Cement, Bulk Chemical 5% qty tolerance by weight and for Cable and Pipe materials 5% qty tolerance by length shall be permissible. Payment will be made on actuals within the tolerance limit.
6	**Transportation:**	Unless otherwise agreed upon, transportation of goods up to the specified destination shall be in Vendor's scope.

		The materials to be dispatched through a transporter registered as per Carriage by Road Act 2007 and Carriage by Road Rules 2011. The Consignment Note/ Lorry receipt must carry the registration number as per the rules stated in The Carriage by Road Rules, 2011. Material shall be delivered in a truck/vehicle having valid documents like Vehicle Registration Certificate, Insurance Certificate, Pollution Under Control Certificate, Fitness Certificate. The vehicle shall not be overloaded and drivers shall have valid driving license. E-way bill to be generated by vendor/vendor's nominated transporter for movement of goods/materials as per Rule 138 of the CGST Rules, 2017 issued by Central Board Of Indirect Taxes & Customs and any subsequent amendment thereafter.
7	**Despatch:**	Unless otherwise specified, all LR/RR etc. must be in the name of Numaligarh Refinery Limited and not 'Self'. Any demurrage or wharfage paid by NRL to the carriers due to consignments being booked as 'Self' will be recovered from the vendor. No consignment shall be booked on 'Said to Contain' basis. If so, it will be at vendor's own responsibility and risk.
8	**Packing, Marking, Shipping & Documentation:**	All consignments must be securely and appropriately packed and should conform to Standard Material Transport Regulations. The vendor will be held liable for any damages to the goods due to insufficient or defective packing as well as for corrosion due to insufficient protection. Each package shall be clearly marked with indelible paint with the Purchase Order No., From (Name & Add.), To (Name & Add.), Destination, Item Net & Gross Weight, Case No. (Sl. No. of Total Cases) & Dimensions, and shall contain copies of despatch documents and packing list. Details given in the "Packing, Marking, Shipping and Documentation Specification. for Indigenous Materials" - wherever enclosed with a Purchase Order shall be strictly followed. For chemicals, MSDS should be a part of transportation documents (the document should specifically mention the conditions for material storage). In case the Chemical is hazardous in nature, it should be legibly recorded on the body of the Drum/ Can as applicable.
9.1 A	**Test Certificate:**	Test certificate of representative samples conforming to PO specifications from the manufacturer/Govt. approved laboratory/NRL nominated agency must be furnished along with supplies. In case of 3rd Party Inspection, the Inspection Reports must accompany all despatch documents as well as supplies. Further, shelf-life certificate to be submitted if applicable for the items.
9.1 B	**Shelf Life Certification:**	Shelf Life for Material / Chemicals / Consumables to be declared based on applicability of the same. A certificate to this effect should be submitted separately certified by competent authority. This is mandatory for all such procurements which become eligible under this broad head.
10	**Guarantee/ Warranty:**	10.1. Materials shall be guaranteed against manufacturing defects, materials, workmanship and design for a period of 12 months from the date of commissioning or 18 months from the date of last dispatch whichever is earlier. Warranty for replacement of material/ accessories should be provided free of charges at our premises. The above guarantee/warranty will be without prejudice to the certificate of inspection or material receipt note issued by us in respect of the materials. 10.2. All the materials including components and sub-contracted items should be guaranteed by the vendor within the warranty period mentioned above. In the event of any defect in the material, the vendor will replace / repair the material at NRL's concerned location at vendor's risk and cost on due notice. 10.3. In case, vendor does not replace / repair the material on due notice, rejected material will be sent to the vendor on "Freight to pay" basis for free replacement. Material after rectification of defects shall be dispatched by the

		vendor on "Freight Paid" basis. Alternatively, NRL reserves the right to have the material repaired / replaced at the locations concerned, at the vendor's risk, cost and responsibility. 10.4. The Vendor shall provide similar warrantee on the parts, components, fittings, accessories etc. so repaired and / or replaced. 10.5. The replacement goods/services shall follow the same Quality Assurance Plan.
11	**Insurance Charges:**	11.1 Transit insurance shall be in the scope of vendor where delivery basis requirement is 'FOR NRL Site'. 11.2 Only when specifically mentioned in enquiry that delivery basis requirement is 'Ex-works' and transportation by NRL; in those cases only Transit Insurance shall be in NRL's scope. In such instances, vendor shall intimate dispatch details and value of goods in advance over e-mail for transit insurance coverage.
12	**Bank Charges:**	Unless otherwise specified, in case of payment through bank, respective bank charges shall be to respective account.
13	**Offer Validity:**	The vendor's offer shall be valid for acceptance for a period of 90 days from the final due date of the enquiry. In case the Tenderer revokes/cancels/varies/withdraws his tender within the above period, the OWNER shall have the right to forfeit the EMD, if any, without any further notice to the tenderer. In case of such revocation or cancellation or variation by the Tenderer, without the consent of the OWNER, the OWNER shall have the right to put the tenderer on holiday list, barring the tenderer from participating in any tender for future tenders.
14	**Taxes & Duties:**	All vendors shall have valid GST registration in the concerned State as applicable and vendor shall quote their GSTIN number in the quotation wherever required. 14. 1 **GST**: 14.1.1 GST extra as applicable at the time of delivery within scheduled delivery period will be payable by NRL against documentary evidence. Vendor shall mention in their offer, the percentage of GST applicable at present. Any upward variation in GST rates, beyond the contractual delivery period, shall be to vendor's account. 14.1.2 In case GST is not applicable at present: In case GST gets levied due to change in turnover of Vendor, shall be borne by the vendor. If GST becomes applicable due to change in the law in future, the same will be borne by vendor subject to 14.1.1. In case of change in stand of vendor about applicable rate of GST towards higher side, the same will not be payable. 14.1.3 Owner shall take Input Tax Credit of the GST paid on the material supplied for both GST and cess component as applicable and accordingly GST / Cess should be quoted separately wherever applicable. Vendor shall ask the transporter of the goods to hand over the copy of GST invoice (transporter's copy) at the time of delivery of goods at owner's site. The vendor shall take steps viz. mention relevant GSTIN of NRL in GST invoices and returns, uploading invoice in GSTR 1, payment of the tax liability on the said invoices and filing of Returns etc. and comply with all the requirements of applicable laws including GST laws for the time being in force to enable the OWNER to avail tax credit/s including input tax credit. Any loss or non-availability of input tax credit by the OWNER due to non-compliance of applicable tax law including but not limited to GST laws in force or otherwise, on the part of VENDOR, an amount equivalent to any tax liability accruing to the OWNER and/or to the extent of any loss accrued to the OWNER due to the non-availability of input tax credit or any liability accrued to the OWNER shall either stand cancelled or deducted from the payment due to the VENDOR or shall be reimbursed by the VENDOR as the case may be till such default

		is either rectified or made good by the VENDOR and the OWNER is satisfied that it is in a position to claim valid input tax credit within the timelines as per applicable laws. Any cost, liability, dues, penalty, fees, interest as the case may be which accrues to the OWNER at any point of time on account of non-compliance of applicable tax laws or rules or regulations thereof or otherwise due to default on the part of VENDOR shall be borne by the VENDOR. An amount equivalent to such cost, liability, dues, penalty, fees, and interest as the case may be shall be reimbursed by the VENDOR within 30 days. Any GST as may be applicable on such recovery of amount shall also be borne by VENDOR and same shall be collected by the OWNER. NRL's …… Range : Bokakhat Division : Jorhat Commissionerate : Dibrugarh PAN : AAACN6984B GSTN : 18AAACN6984B1ZD (Assam) 19AAACN6984B1ZB (WB) 21AAACN6984B2ZP (Odisha) 07AAACN6984B1ZG (Delhi) 07AAACN6984B2ZF* (*Input Service Distributor Delhi)
15	**Delivery Period, Delayed Delivery & Liquidated Damages:**	15.1 The time and date of Delivery of Material(s) as stipulated in the order shall be strictly adhered to on the clear understanding that the Price(s) of the Material(s) has/have been fixed with reference to the said Delivery date(s). 15.2 The inability of vendors to execute orders in accordance with the agreed/quoted delivery schedule will entitle NRL, at its options, to: 15.2.1 While granting extension of the delivery period, where the delivery of goods or any part thereof is accepted after expiry of the original delivery period, NRL may recover from the vendor, the LD a sum equivalent to 0.5% (half percent) per week or part thereof of delay. The total liquidated damages shall not exceed 5% (five percent) of the total value of the goods. However, if delivery of goods (including installation & commissioning) in a staggered/splitable manner is possible and permissible, then, the LD imposed would be on the value of the portion of the delayed goods. If the contract involves assembling/ integration/ commissioning of all the ordered goods to get the desired product/output, then, the LD imposed would be on the total order value of goods. Compensation for loss on account of late delivery (actually incurred as well as notional) where loss is pre-estimated is termed as LD. There is no need to establish actual loss due to late delivery. Price reduction clause (PRC) for late delivery shall convey the same meaning as Liquidated Damages (LD). Where any delay in delivery is due to default by the seller/contractor, any increase in statutory duties and/or upward rise in prices due to the price variation clause (PVC) and/or any adverse fluctuation in foreign exchange during the extended/delayed delivery period are to be borne by the seller/contractor. This will be over and above levy of LD/PRC. However, the purchaser reserves his right to get any benefit of a downward revisions in statutory duties, PVC and foreign exchange rate during the extended/delayed delivery period. Thus, PVC, other variations and foreign exchange clauses operate only during the original delivery period. 15.2.2 Cancel the order in part or full and purchase such cancelled quantities from elsewhere on account at the risk and cost of the vendor, without prejudice

		to its right under 15.2.1 above in respect of goods delivered. Note: a) In case of package items (ordered as a complete system), the price reduction for delayed delivery shall be applicable on the entire order value of that package and not on the value of the undelivered portions (even though a billing breakup has been approved). b) In case of purchase of bulk items where tolerance limit is specified (e.g. pipes, cables etc.), price reduction clause shall be applicable on the actual quantity supplied, within the tolerance limit, instead of Purchase Order quantity. **Prior approval from NRL to be taken if the party plans to deliver the material in parts / partial shipment basis in case the same is not clearly mentioned as allowable in the Purchase Order.**
16	**Repeat Order:**	Repeat Order shall be acceptable to the vendor within 6 months from the date of the Basic Order at the same prices, terms & conditions as that in the Basic Order.
17	**Part Order:**	Part Order shall be acceptable to the vendor. However, the quantity mentioned in the enquiry documents for each item shall be ordered on one vendor. All applicable lumpsum charges, if any, shall be pro-rata on value basis.
18	**Changes in Terms & Conditions:**	NRL reserves the right to make changes at any time in quantities of items ordered or in specification and drawings. If such changes cause an increase or decrease in the amount due or in the delivery period, an equitable adjustment shall be made. Any claim for adjustment under this provision must be assessed within 10 days from the date when the changes are ordered by NRL.
19	**Right of Rejection:**	NRL reserves the unfettered right to reject any or all offers without assigning any reasons thereof.
20	**Arbitration:**	SETTLEMENT OF DISPUTES I. FOR THE SETTLEMENT OF DISPUTES BETWEEN THE COMPANY and THE PARTY, OTHER THAN CENTRAL PUBLIC SECTOR UNDERTAKINGS All disputes of difference whatsoever which shall at any time arise between the parties hereto touching or concerning the works or supply or the execution or maintenance thereof of this contract/supply or the rights touching or concerning the works or the execution effect thereof or to the rights or liabilities or the construction meaning , operation or effect thereof or to the rights or liabilities of the parties or arising out of or in relation thereto whether during or after completion of the Contract/supply or whether before or after determination, foreclosure or breach of the contract/supply (other than those in respect of which the decision of any person is by the contract/supply expressed to be final and binding) shall be endeavoured to be amicably settled by the parties in the following manner: a) At the first instance by the Engineer-In-Charge/ Purchase Officer b) At the second instance by the Chief Executive of NRL (Presently Managing Director) or authorised representatives of Chief Executive of NRL. c) Parties may opt for conciliation under Arbitration and Conciliation Act 1996 as amended by the Arbitration and Conciliation (Amendment) Act, 2015 or any statutory modification or re-enactment thereof. d) In case party raising the dispute is not satisfied of the dispute by the aforesaid process and/or the dispute is not resolved by mutual agreement and put in

writing within 3(Three) months or within such further period as may be mutually agreed from the date the dispute arose, the matter and/or dispute will be then referred to Arbitration and such disputes and/or difference will be resolved through Arbitration according to Arbitration clause mentioned herein below.

e) However the option of amicably settling the dispute will be open at any time during and post arbitration or during pendency of any court proceeding, arising out of such Arbitration, and is pending before any Court or Tribunal or in any other judicial forum and/or before or after award, order, judgement etc. passed by arbitrator(s), court(s), tribunal(s) or any other judicial forum(s).

ARBITRATION CLAUSE :

i. Any dispute or difference of any nature whatsoever, any claim, cross-claim, counter-claim or set off of NRL (hereinafter Company) against the Contractor/Vendors or of the Contractor/Vendors against company or regarding any right, liability, act, omission on account of any of the parties hereto arising out of or in relation to this agreement shall be resolved through Arbitration under Arbitration and Conciliation Act 1996 as amended by the Arbitration and Conciliation (Amendment) Act, 2015 or any statutory modification or re-enactment thereof.

ii. Reference to Arbitration shall be made by writing a letter to the Managing Director of the Company, with copy to the Contractor/Vendor or the company, as the case may be.

iii. On receipt of such letter referring the dispute to Arbitration, Managing Director or any other officer of the Company delegated by Managing Director shall, within 30 days from the receipt of the said letter, suggest to the parties the names of three persons, who are not disqualified to act as such Arbitrator under the Arbitration and Conciliation Act 1996, as amended by the Arbitration and Conciliation (Amendment) Act, 2015 or any statutory modification or re-enactment thereof for selection of one of them for appointment as a sole Arbitrator, to adjudicate the dispute(s) between the parties.

iv. If while referring the dispute to Arbitration the parties mutually agree that the Arbitration will be by a Tribunal consisting of three Arbitrators, then each party will nominate one person, who is not forbidden to act as Arbitrator and the two Arbitrators so nominated will select the third and Presiding Arbitrator to adjudicate the dispute.

v. Subject to the provisions of the Arbitration and Conciliation Act, 1996, as amended by the Arbitration and Conciliation (Amendment) Act, 2015 or any statutory modification or re-enactment thereof, the Award of the Arbitrator or the Arbitrators, as the case may be, shall be final, conclusive and binding on both parties to the Agreement.

vi. The party(ies) against whom the Arbitration proceedings have been initiated, that is to say, the Respondents in the proceedings, shall be entitled to prefer a Cross-Claim, Counter- Claim or set off before the Arbitrator(s) in respect of any matter or issue arising out of or in relation to the Agreement without seeking a formal reference to Arbitration for such Counter-Claim, Cross Claim or set off and the Arbitrator(s) shall be entitled to consider and deal with the same as if the matters arising there from has/have been referred to him/them originally and deemed to form part of the reference made to Arbitration.

vii. Place of arbitration, unless otherwise mutually agreed by the parties, will be Numaligarh Or Guwahati.

viii. The parties hereby agree that, unless the Arbitration and Conciliation Act,1996, as amended by the Arbitration and Conciliation (Amendment) Act, 2015 or any statutory modification or re-enactment thereof prohibits, the courts in the city of

		Golaghat or Guwahati shall have jurisdiction to entertain any application or other proceedings in respect of anything arising under this agreement and any award or awards made by the Sole Arbitrator(s) / Arbitral tribunal shall be filed in the concerned courts in the District Court of Golaghat or Kamrup Metro . II. FOR THE SETTLEMENT OF DISPUTES WITH Central PSUs / Government (except a dispute or difference concerning the Railways, Income Tax, Customs and Excise Duties) appointment will be done as per Government guidelines / circulars, etc. prevailing at the time of reference of the disputes.
21	**Jurisdiction:**	All disputes, actions and proceedings arising out of this contract shall be under the jurisdictions of the courts in the city of Golaghat or Guwahati.
22	**Acceptance of bid & Acknowledgement of Order:**	Upon acceptance of bid, a brief LOA (or GeM contract in case of GeM tenders) will be issued to the successful agency. If applicable as per tender / LOA / GeM contract, contract performance security (CPS), has to be submitted by the successful agency within the specified/allowed timeline. Upon submission of CPS by the agency, system generated detailed purchase order will be issued for the purpose of signing of contract. No bills will be processed until the CPS deposit, if applicable, is received by NRL. Following standard clause will become part of the detailed contract: QUOTE [*Documents referred will be suitably removed / added / filled by NRL, as applicable*] "This Order ("*WO/PO/DLoA/FOA No. and date*") is issued pursuant to the Terms and Conditions mentioned in the RFQ/NIT (including, inter-alia, the General Purchase Conditions (GPC) 'and/or' the General Conditions of Contracts (GCC) including the clause for Arbitration therein; Special Purchase Conditions 'and/or' Special Conditions of Contract; Schedule of Rate (SOR); General Obligations, Specifications, Drawings, Plans, Time Schedule of Delivery/Completion); 'and/or' Terms and Conditions mutually agreed in writing thereafter 'and/or' outlined herein. Acknowledgement of this Order by [*Vendor's Name*] implies an agreement to adhere to these specified terms / documents, forming a binding contract between [*Vendor's Name*] (the Vendor/Contractor) and Numaligarh Refinery Limited (the Owner)." [Sealed / Signed & Dated by – *NRL Signatory*] [Sealed / Signed & Dated in acknowledgement by - *Vendor's Name*] UNQUOTE The vendor shall acknowledge receipt of the purchase order within 7 days of receipt. The vendor shall sign & seal (or digitally sign) the acknowledgement and return the same to NRL.
23	**Distribution of Documents:**	GST Invoices [03 sets in Original (duly seal and signed)/Digitally Signed Invoice] and other original despatch documents shall be sent to the following billing address: NRL Bill Desk Administrative Building, Numaligarh Refinery Limited Pankagrant, P.O. Numaligarh Refinery Project (NRP) District: Golaghat, Assam, India. Pin Code : 785699 E-mail: z_billdesk@nrl.co.in
24	**Conflict among other Terms and Conditions:**	In case of conflict between these General Terms & Conditions and any other special or typed conditions agreed to for a particular Purchase Order, the later shall prevail to the extent applicable.
25	**Non Assignment:**	The Purchase Order shall not be assigned by the vendor to any other party without prior written permission from NRL.
26	**Control Regulations:**	Vendor shall arrange for supply and despatch in strict conformity with the control regulations applicable and after obtaining permits, if any, under the regulations in force from time to time.

<table>
<tr><td></td><td></td><td></td></tr>
<tr><td>27</td><td>Govt. Policy:</td><td>The existing policy of the Government of India with regard to Purchase Preference to Public Sector Enterprises shall be applicable.</td></tr>
<tr><td>28</td><td>Purchase Preference as per Govt. Policies:</td><td>NRL reserves the right to provide purchase preference to bidders as per MSE/ PP-LC/Any other Govt. policy in place.</td></tr>
<tr><td>29(A)</td><td>Contract Performance Security (CPS):</td><td>To ensure due performance of the contract, contract performance security is to be deposited by the successful bidder awarded the contract [CPS is also referred to as PBG or ePBG in GeM].

The rate of Contract Performance Security shall be as follows, unless otherwise specified in the NIT/RFQ:

<table>
<tr><th>Type of Contract</th><th>Rate of CPS</th></tr>
<tr><td>Procurement of materials up to an individual contract value of Rs. 10 Lakhs.</td><td>Nil</td></tr>
<tr><td>Procurement of Spares and materials of proprietary nature from original manufacturer / the sole selling agent of OEM / authorized dealer of OEM/Proprietary vendor.

Supplies by Govt. Agencies or Institutions (Other than PSUs), Departments/Agencies/Autonomous Bodies under control of State/Central Government.</td><td>Nil</td></tr>
<tr><td>Procurement of materials including nomination, LSTK contract above an individual contract value of Rs.10 Lakhs.</td><td>3% of contract value</td></tr>
<tr><td>Materials for Plant Emergency / Emergency (Emergency to be declared by NRL).</td><td>Nil</td></tr>
<tr><td>Nomination supplies by PSUs.</td><td>Nil</td></tr>
<tr><td>Procurement of materials through ARC (Annual Rate Contract).

[Annualized estimated contract value shall be considered in absence of a defined contract value. In case the contract period is 1 year or less the performance security shall be 3% of contract value].</td><td>3% of annualized / estimated contract value</td></tr>
<tr><td>Procurement of materials with Staggered delivery.</td><td>3% of contract value</td></tr>
</table>

Note:-
1) For the purpose of determining the applicability and amount of Contract Performance Security, the contract / order value including delivery charges like packing, freight, insurance, TPI etc. and value of associated services like installation, commissioning, AMC etc. shall be considered unless otherwise specified in the RFQ/NIT. However, the order value excluding taxes and duties shall be considered for determining the amount of security/BG. For GeM contracts, applicability limits or value as ascertained by GeM policy shall be applicable.
2) Annualized contract value shall be total contract value [as defined in (1) above] divided by the number of years [provisional extension period, if any, and corresponding value, shall be excluded].

Contract Performance Security is to be furnished within 10 days from the date of notification of the award (LOA) and it should remain valid for a period of 03 (three) months beyond the date of completion of all contractual obligations of the contractor, including warranty / guarantee / defect liability period (if any). The CPS may be deposited through online payment in an acceptable form to designated account of NRL or in the form of BG as per prescribed format for CPS [refer clause 40 below for further details].

The earnest money deposit (EMD), wherever applicable, of the contractor whose tender may be accepted, if paid in forms other than Bank Guarantee, can be converted to and adjusted with contract performance security for due performance of the contract, if the contractor so desires. In such case, the shortfall amount towards CPS (if any) may be deposited through online payment in an acceptable form to designated account of NRL or in the form of BG as per prescribed format of NRL (or GeM) for CPS.</td></tr>
</table>

		Detailed contract shall be signed and entered into after receipt and verification of the requisite CPS, if applicable. If the bidder, whose bid has been found to be the lowest evaluated bid withdraws or whose bid has been accepted fails to honour the procurement contract as may be required, or fails to provide the contract performance security within the time provided by NRL or otherwise withdraws from the procurement process or is found to have neglected / abandoned the order / LOA, the award may be terminated, the agency may be debarred as per holiday listing policy of NRL and his EMD/Bid security may be forfeited and other penal actions for breach of contract may be initiated, after serving a show cause notice. The performance security will be forfeited and credited to the procuring entity's account in the event of a breach of contract by the contractor. It would be refunded to the contractor without interest, after he duly performs and completes all obligations under the contract including the warranty period. Proforma of Bank Guarantee for Contract Performance Security is available in www.nrl.co.in (Tenders -> Download Manuals section).
29	**Warranty Bank Guarantee (WBG):**	In case of **capital equipment goods**, supplied materials shall be guaranteed against manufacturing defects arising from design, material, workmanship or any omission on part of the vendor/contractor for a period of 12 months from the date of commissioning or 18 months from the date of last dispatch whichever is earlier, unless otherwise specified in the RFQ/NIT. For materials other than capital equipment goods, Guarantee/Warranty of the supplied goods shall be provided by the supplier/contractor where a condition for Guarantee/Warranty is specifically provided in the RFQ/NIT. The period of Guarantee/Warranty shall be as per clause 10 above or as mentioned in the Guarantee/Warranty clause of the RFQ/NIT. In such cases, as specified above, a Warranty Bank Guarantee (in addition to CPS) is required to be submitted in the prescribed format, in the currency of the contract, valid for 03 (three) months beyond the Guarantee/Warranty period. The rate of Warranty Bank Guarantee shall be as follows, unless otherwise specified in the NIT/RFQ:

Type of Contract	**Amount of Warranty Bank Guarantee**
Procurement of materials up to an individual contract value of Rs. 10 Lakhs.	Nil
Procurement of Spares and materials of proprietary nature from original manufacturer / the sole selling agent of OEM / authorized dealer of OEM/Proprietary vendor. Supplies by Govt. Agencies or Institutions (Other than PSUs), Departments/Agencies/Autonomous Bodies under control of State/Central Government.	Nil
Procurement of materials including nomination, LSTK contract above an individual contract value of Rs.10 Lakhs.	**7%** of contract value
Materials for Plant Emergency / Emergency	**7%** of contract value
Nomination supplies by PSUs.	**7%** of contract value
Procurement of materials through ARC (Annual Rate Contract). [Annualized estimated contract value shall be considered in absence of a defined contract value. In case the contract period is 1 year or less the performance security shall be 7% of contract value].	**7%** of annualized / estimated contract value
Procurement of materials with Staggered delivery.	**7%** of contract value / individual lot ordered, at the discretion of supplier

		Note:- 1) For the purpose of determining the applicability and amount of Warranty Bank Guarantee, the contract / order value including delivery charges like packing, freight, insurance, TPI etc. and value of associated services like installation, commissioning, AMC etc. shall be considered unless otherwise specified in the RFQ/NIT. However, the order value excluding taxes and duties shall be considered for determining the amount of security/BG. For GeM contracts, value as ascertained by GeM policy shall be applicable. 2) Annualized contract value shall be total contract value [as defined in (1) above] divided by the number of years [provisional extension period, if any, and corresponding value, shall be excluded]. Vendor shall submit the Warranty Bank Guarantee for amount of Seven percent (7%) of the contract value as with an unconditional BG, as per prescribed format of NRL, [*refer clause 40 below for further details*] "OR" In cases, where WBG is applicable, it is normally permissible to allow Contract Performance Security to be valid upto 90 (ninety) days beyond delivery/ commissioning period; and the vendor may submit a fresh Warranty Bank Guarantee of 10 (ten) per cent of the value of the goods in the currency of the contract valid upto 90 (ninety) days beyond the Guarantee/Warranty period. In such cases, the performance guarantee will be returned only after satisfactory delivery/commissioning and receipt of the warranty bank guarantee. Further, contractor may at his option submit a Contract Performance Security covering also the WBG value (where WBG is applicable), valid for a period of 03 (three) months beyond the date of completion of all contractual obligations of the contractor, including warranty / guarantee / defect liability period (if any) – in which case, he will not be required to submit a BG for Warranty. In case, WBG is not provided by the vendor, equivalent amount shall be kept on hold from his first payment [or subsequent payment(s), if insufficient from first payment] in lieu of Warranty Bank Guarantee. All compensation or other sums of money payable by the contractor to the owner under terms of the contract may be deducted from or paid by the encashment of a sufficient part of his WBG (and CPS) or from any sums which may be due or may become due to the contractor by the owner. No interest shall be payable by the owner for the sum deposited as CPS or WBG. The CPS and/or WBG amounts will be refunded to the contractor without interest, after he duly performs and completes all obligations under the contract including the warranty period. Proforma of Bank Guarantee for Indigenous Purchase (Warranty/Guarantee) is available at www.nrl.co.in in Tender Room section.
30	**Spare Parts:**	The vendor must furnish itemized and price list of spare parts required for two year's operation of equipment wherever applicable. The vendor shall provide the necessary cross sectional drawings to identify the spare parts numbers and their location as well as in interchangeability chart, wherever applicable.
31	**Force Majeure:**	A Force Majeure (FM) means extraordinary events or circumstance beyond human control such as an event described as:- (i) An act of God: A natural calamity like flood, storm, drought, lightning, tidal wave, tsunami, cyclone other natural disaster; earthquakes, epidemics, plague, quarantine restrictions. (ii) Or events such as a war, strike, riots, rebellion or sabotage, terrorism or acts of public enemy (including the acts of any independent unit or individual engaged in activities in furtherance of a programme of irregular warfare), acts of belligerence of foreign enemies (whether declared or undeclared), blockades, revolution, or insurrection, exercise of military or usurped power, or any attempt at usurpation of power; lockouts, crimes, hostility, civil commotion.

		(iii) Unforeseen incidents such as fires, explosions, accidents, loss or breakage of major equipment or facilities, structural collapse, radioactive contamination or ionizing radiation; air crash, shipwreck, or train wreck. (iv) Or events like expropriation of facilities by Government authorities, compliance with any order or request of any Governmental authorities, and freight embargoes FM does not include negligence or wrong-doing, predictable/seasonal rain and any other events specifically excluded in the clause. A FM clause in the contract frees both parties from contractual liability or obligation when prevented by such events from fulfilling their obligations under the contract. An FM clause does not excuse a party's non-performance entirely, but only suspends it for the duration of the FM. The contractor has to give notice of FM within 14 days from the date of such event and it cannot be claimed ex-post facto. There may be a FM situation affecting the purchase organisation only. In such a situation, the purchase organisation is to communicate with the supplier along similar lines as above for further necessary action. If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of FM for a period exceeding 90 (ninety) days, either party may at its option terminate the contract without any financial repercussion on either side. Any delays in or failure of the performance of either party hereto shall not constitute default hereunder or give rise to any claims for damages, if any, to the extent such delays or failure of performance is caused by force majeure. Upon receipt of the intimation from the contractor of the happening of a FM event, the EIC shall within 10 days therefrom, determine as to whether such event is an FM event within the meaning of the FM clause and such decision of the EIC shall be final and binding upon the parties. In case EIC is not applicable in the contract, the decision of the HOD of Commercial Dept. shall be final and binding.
32	**Sales Conditions:**	On the issue of Purchase Order after process of tender, vendor waives and considers as cancelled any of his general sales conditions.
33	**New & Unused Materials:**	All the material supplied by the vendor shall be brand new, unused and of recent manufacture.
34	**Limitation of Liability:**	The aggregate liability of the Vendor to NRL under the Contract shall be total Contract Price/total Contract Value, except that this Clause shall not limit the liability of the Contract for following; i. Any liability pursuant to vendor's breach of any Applicable Law; or ii. Any loss resulting from fraud, intentional or willful misconduct or illegal or unlawful acts or gross negligence or omissions of vendor or its affiliates or any sub-vendor or any supplier or any of its or their respective officers, directors, employees, servants or agents or any other person acting on behalf of the Vendor; or iii. Any liability to rectify, repair, restore or replace any materials and / or works or deficiencies therein in terms of the Contract; or iv. In the event of any claim or loss or damage arising out of infringement of Intellectual Property. Neither party shall be liable to the other party for any kind of indirect or consequential loss or damage including loss of use, loss of profit, loss of production or business interruption which is connected with any claim arising under the contract.
35	**Compliance of Regulations:**	Vendor warrants that all goods/Materials covered by this order have been produced, sold, dispatched, delivered and furnished in strict compliance with all applicable laws,

		regulations, labour agreement, working condition and technical codes and statutory requirements as applicable from time to time. The vendor shall ensure compliance with the above and shall indemnify owner against any actions, damages, costs and expenses of any failure to comply as aforesaid.
35 (A)	**Governing Law:**	Regardless of the place of contracting, place of performance or otherwise, this Agreement, and all amendments, modifications, alterations, or supplements, thereto shall be governed by the laws of India and respective state laws for the nature, validity and interpretation thereof.
36	**Integrity Pact:**	Vendors are requested to sign & return our pre-signed IP document, if applicable. This document is essential & binding. Vendor's failure to return the IP document duly signed along with Bid Document may result in the bid not being considered for further evaluation.
36(A)	**Conflict of Interest among Bidders/ Agents:**	A bidder shall not have conflict of interest with other bidders. The bidders found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if: a) they have controlling partner(s) in common; or b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or c) they have the same legal representative/agent for purposes of this bid; or d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid. f) In cases of agents quoting in offshore procurements (GTE), on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following: 1. The principal manufacturer directly or through one Indian agent on his behalf; and [in case of receipt of bids from both the Indian agent & the principal, the **principal manufacturer** shall be approached to arrange for withdrawal of one of the bids; in case of non-withdrawal, the bid from the **principal manufacturer** shall be considered] 2. Indian/foreign agent on behalf of only one principal. g) a Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business. i) However, restrictions under (a), (b), (c), (d) shall not be applicable against licensor recommended agents / suppliers and central/state PSUs. j) Self-declaration from participating bidders w.r.t. not having any conflict of interest with other participating bidders shall be submitted with bids. In case any conflict of interest is found to have occurred, such bidders shall be informed to keep any one bid and withdraw the rest of the bids; In case of non-withdrawal, NRL shall disqualify all such bids with conflict of interest.
37	**Competitive Agreements/ Abuse of**	The Competition Act, 2002 as amended by the Competition Amendment) Act 2007 (the Act), prohibits anti-competitive practices and aims at fostering competition and at protecting Indian markets against anti- competitive practices by enterprises. The

	Dominant Position:	Act prohibits anti-competitive agreements, abuse of dominant position by enterprises, and regulates combinations (consisting of acquisition, acquiring of control and M&A) wherever such agreements, abuse or combination causes, or is likely to cause, appreciable adverse effect on competition in markets in India. NRL reserves the right to approach the Competition Commission established under the Act of Parliament and file information relating to anti-competitive agreements and abuse of dominant position. If such a situation arises, then Vendors are bound by the decision of the Competitive Commission and also subject to penalty and other provisions of the Competition Act.
38	**Policy on Holiday Listing:**	NRL's policy for holiday listing/ banning/ debarring of contractors/ suppliers, as prevailing on the date of issue of the show-cause notice, shall be applicable. For updated holiday listing policy, the NRL website www.nrl.co.in shall be referred.
39	**Right of Bidder to Question Rejection at Techno-Commercial Stage:**	The tenderer is to be permitted to send his representation in writing in case he feels that a proper procurement process is not being followed and/or his techno-commercial bid has been rejected wrongly. In case of techno-commercial rejection, such representation must be submitted within 48 hours from notification. Representation in case of GeM tenders must be submitted through the facility provided in GeM portal. **Bidder's right to question rejection of his bid:-** Only a directly affected bidder can represent in this regard:- i) Only a bidder who has participated in the concerned procurement process (i.e., pre-qualification and bidding) can make such representation; ii) In case pre-qualification bid has been evaluated before the bidding of technical/ financial bids (in 2 stage bidding process), an application for review in relation to the technical/ financial bid may be filed only by a bidder who has qualified in pre-qualification bid (1st stage); iii) In case techno-commercial bid has been evaluated before the opening of the financial bid, an application for review in relation to the financial bid may be filed only by a bidder whose technical bid is found to be acceptable. iv) However, following shall not be subject to review: a) Determination of the need for procurement; b) Selection of the mode of procurement or bidding system; c) Choice of selection procedure; d) Provisions limiting participation of bidders in the procurement process; e) The decision to enter into negotiations with the L1 bidder; f) Cancellation of the procurement process except where it is intended to subsequently re-tender the same requirements; g) Issues related to ambiguity in contract terms may not be taken up after a contract has been signed, all such issues should be highlighted before consummation of the contract by the vendor/contractor; and h) Complaints against specifications, except under the premise that they are either vague or too specific so as to limit competition.
39(A)	**Confidentiality of Bid Evaluation Process:**	Information relating to the examination, clarification, evaluation and comparison of bids, and recommendations for the award of a contract, shall not be disclosed to bidders or any other person not officially concerned with such a process until the award to the successful bidder has been announced. From the time of bid opening to the time of contract award, no bidder shall contact the Procuring Entity on any matter related to the bid, except on request and prior written permission. Any effort by the bidder to influence the Procuring Entity in bid evaluation, bid comparison or contract award decisions will vitiate the process and will result in the rejection of the bidder's bid.
40	**Submission of CPS/WBG:**	**(a) Mode of submission of CPS / WBG:** Performance security / WBG may be furnished in the form of bank guarantee (including e-Bank Guarantee) issued/confirmed from any of the commercial bank in

		India in the prescribed format of NRL or through online payment in an acceptable form to designated account of NRL (receipt/acknowledgement of the online transaction to be immediately submitted by bidder to NRL). The performance security shall be denominated in the currency of the contract. In case of GTE tenders, the performance security should be in the same currency as the contract and must conform to Uniform Rules for Demand Guarantees (URDG 758) – an international convention regulating international securities. The Bank Guarantee shall be issued from: a) Any schedule Indian Bank or Any Branch of an International bank situated in India and registered with Reserve Bank of India as scheduled foreign bank in case of domestic bidder, or b) In case of foreign bidder, the bank guarantee can be accepted from any scheduled bank in India or from International bank who has its branch in India registered with Reserve Bank of India, or c) Any foreign Bank which is not a Scheduled Bank in India, provided the Bank Guarantee issued by such Bank is counter-guaranteed by any Branch situated in India of any Scheduled Bank incorporated in India. d) Bank Guarantee issued by a Bank, amongst others, must contain the following particulars of such bank: ▪ Full address. ▪ Branch Code. ▪ Code Nos. of the authorized signatory with full name and designation. ▪ Phone Nos., Fax Nos., E-mail address. e) The domestic bidders will have to submit the Bank Guarantee from any of the scheduled banks and on non-judicial stamp paper of requisite value as per the Indian Stamp Act, purchased in the name of the issuing banker. f) The Bank Guarantee issued by the Bank must be routed through SFMS platform as per details provided in the format for BG. g) The foreign bidder will submit the Bank Guarantee from Banks of Indian origin situated in their country. In case no such bank of Indian origin is situated in their country, the Bank Guarantee may be submitted from the bankers as specified above. h) In case of GTE tenders, the performance security / warranty bank guarantee should be in the same currency as the contract and must conform to Uniform Rules. **Note**: *In case of GeM tenders the BG format, applicability limits and calculation for performance security as per GeM shall also be accepted.* **(b) Examination / verification of BGs:** All bank guarantees received against a contract/order, shall be verified by NRL for the submitted format, order no., amount of the bank guarantee and name of the party on whose behalf it has been issued along with whether the following, as applicable:- (i) The BG contains the name, designation and code number of the Bank officer(s) signing the guarantee(s). (ii) The address and other details (including telephone no.) of the controlling officer of the bank are obtained from the branch of the bank issuing the BG (this should be included in all BGs). In order to know the authenticity of the bank guarantee submitted by the bidder,

		NRL shall obtain Structured Financial Messaging Solutions (SFMS) confirmation (or written confirmation through letter for non-SFMS) from the designated bank of the Company.
41	**Other Information w.r.t. Bank Guarantees:**	(a) e-Bank Guarantees are accepted by NRL. Detailed modality for submission of e-BGs shall be provided in the RFQ or respective proforma for BG or provided by NRL on request. (b) For the following BGs, wherever applicable, the value of the BG shall be calculated as provided under:- **(i) BG against Milestone Payment / RA Bill**: The value of the BG, if applicable, shall be equal to the amount of milestone payment(s), excluding any taxes and duties which are paid extra by NRL. GST component shall be paid based on GSTR2B updation by seller. [*Unless otherwise specified in the RFQ*.] **(ii) BG against Advance Payment / Mobilization Advance**: The value of the BG, where applicable, shall be equal to 110% of the advance amount(s) including any GST/Taxes to be paid extra by NRL. [*Advance Payment / Mobilization Advance is interest bearing and is not accepted by NRL, unless otherwise specifically provided for in the RFQ*.]

****

Validate Print Help

Tender Inviting Authority: EIL on behalf of NRL

Name of Work/Item: VALVES GATE GLOBE & CHECK

Contract/RFQ No: LT/B440-003-WB-MR-3517/158

PREAMBLE:

1. Scope of supply including testing, inspection, documentation etc., shall be strictly as per Material Requisition(MR) and other documents which are part of RFQ.
2. Bidders quoted prices are for complete scope of supply as per MR and are inclusive of drawing and documentation charges for all supplies and services as per MR.
3. Price Basis(Unit Rate(in INR)): On FOT Dispatch Point Basis inclusive of Packing and Forwarding (P&F) charges and TPIA charges.
4. Bidder must quote Freight charges up to Project site in percentage of supply price for respective Item for which bidder is quoting the Supply Prices. If Freight charges are NIL or included in Supply price, bidder must clearly indicate "0" in Freight Column of Price schedule in the Price Bid. If a bidder does not quote freight charges, the offer of such bidder shall be evaluated in line with the provisions of Instructions to Bidder (ITB).
5. Bidder to note that evaluation shall be done on ITEM WISE basis. The order shall be awarded on ITEMWISE basis to the qualified and techno-commercially acceptable bidder who is lowest (L-1) in price for respective ITEM. The bidders can quote for multiple ITEMS. ITEMS shall be awarded to the Bidder(s) who is(are) qualified for the respective ITEM(s) and also Lowest (L1) in prices for the respective ITEM(s).
6. Bidder to note that Technical loading, if any, shall be as per loading criteria if specified in the MR and the same shall be considered for evaluation. Hence, bidder shall quote accordingly.
7. Quoted prices are firm and fixed till complete execution of the entire order and no variation on any account is allowed, unless otherwise categorically specified in RFQ documents.
8. In case of any discrepancy in the item description, quantity, etc. in the Price Schedule format vis-a vis the details provided in MR, the MR details shall prevail.
9. Bidder confirms that he has noted the contents of the Preamble to the Price Schedule, RFQ, Material Requisition, etc. and quoted his prices accordingly without any deviation.
10. Prices shall be quoted strictly as per the price schedule format (BoQ) made available herein without altering any of the contents of the "price schedule" format as well as without deleting / altering / formatting the content of other sheet of this excel sheet. Also, other sheet named MR and Table neither renamed nor to be deleted.

Name of the Bidder/ Bidding Firm / Company :	

PRICE SCHEDULE

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)

MR Item Sl. No.	Item Description	Item Code / Make	Quantity	Units	Unit Rate (in INR) (inclusive of all Taxes and Duties except GST)	Freight (%) Excluding GST
	Supply of following items as per MR					
1	VLV.GATE, SHEET 51301 2.0 INCH	51301ZZZ009ZZZZZZ	4	Nos		
2	VLV.GATE, SHEET 51301 6.0 INCH	51301ZZZ015ZZZZZZ	3	Nos		
3	VLV.GATE, SHEET 51302, IBR 3.0 INCH	51302ZZZ111ZZZZZZ	1	Nos		
4	VLV.GATE, SHEET 51311, NACE 2.0 INCH	51311ZZZ209ZZZZZZ	3	Nos		
5	VLV.GATE, SHEET 51311, NACE 3.0 INCH	51311ZZZ211ZZZZZZ	9	Nos		
6	VLV.GATE, SHEET 51313 3.0 INCH	51313ZZZ011ZZZZZZ	7	Nos		
7	VLV.GATE, SHEET 51321 2.0 INCH, LOCK OPEN	51321ZZZ0091ZZZZZ	1	Nos		
8	VLV.GATE, SHEET 51321 6.0 INCH	51321ZZZ015ZZZZZZ	1	Nos		
9	VLV.GATE, SHEET 51321 14.0 INCH	51321ZZZ019ZZZZZZ	1	Nos		
10	VLV.GATE, SHEET 51380 2.0 INCH	51380ZZZ009ZZZZZZ	3	Nos		
11	VLV.GATE, SHEET 513AF 3.0 INCH, LOCK CLOSED	513AFZZZ0112ZZZZZ	2	Nos		
12	VLV.GATE, SHEET 513HA, HIC1 2.0 INCH, LOCK OPEN	513HAZZZT091ZZZZZ	1	Nos		
13	VLV.GATE, SHEET 513HA, HIC1 2.0 INCH	513HAZZZT09ZZZZZZ	1	Nos		
14	VLV.GATE, SHEET 513HA, HIC1 3.0 INCH, LOCK OPEN	513HAZZZT111ZZZZZ	3	Nos		
15	VLV.GATE, SHEET 51401 2.0 INCH	51401ZZZ009ZZZZZZ	16	Nos		

MR Item Sl. No.	Item Description	Item Code / Make	Quantity	Units	Unit Rate (in INR) (inclusive of all Taxes and Duties except GST)	Freight (%) Excluding GST
16	VLV.GATE, SHEET 51466 2.0 INCH	51466ZZZ009ZZZZZZ	3	Nos		
17	VLV.GLOBE, SHEET 52301 4.0 INCH	52301ZZZ013ZZZZZZ	1	Nos		
18	VLV.GLOBE, SHEET 52313 2.0 INCH	52313ZZZ009ZZZZZZ	1	Nos		
19	VLV.GLOBE, SHEET 52401 2.0 INCH	52401ZZZ009ZZZZZZ	1	Nos		
20	VLV.GLOBE, SHEET 52413 2.0 INCH, LOCK CLOSED	52413ZZZ0092ZZZZZ	2	Nos		
21	VLV.CHECK, SHEET 53301 3.0 INCH	53301ZZZ011ZZZZZZ	1	Nos		
22	VLV.CHECK, SHEET 53402, IBR 2.0 INCH	53402ZZZ109ZZZZZZ	1	Nos		
23	VLV.CHECK, SHEET 53439 4.0 INCH	53439ZZZ013ZZZZZZ	1	Nos		

MATERIAL REQUISITION(TOP SHEET)

ITEM : VALVES GATE GLOBE & CHECK

MR Category : I

Issue Status (*Fill 1 or 2 from below in this bracket*) [ ]

1. -> Entire Requisition Issued

2. -> Only Revised Pages are Issued

PDD ITEMCODE : 50AA,50BA,50CA

DOCUMENT NUMBER

(Always quote this document number given below as reference)

B440	003	WB	MR	3517	A	12-01-2026	16/43
JOB NO.	UNIT / AREA	COST CENTRE	DOC CODE	SR. NO	REV	DATE	ORIGINATING DIVN./DEPT

VENDOR CODE	VENDOR NAME

Material to be delivered at (job site) NRL,NUMALIGARH , ASSAM within the delivery period specified in the "Request For Quotation"(RFQ).

Notes :

1. This page is a record of all the Revisions of this Requisition.
2. The nature of the Revision is briefly stated in the "Details" column below, the Requisition in its entirety shall be considered for contractual purposes.
3. When a Requisition is revised, only the revised pages may be issued.
4. When revised pages only are issued, the revised pages shall form part of the original Requisition. The original requisition alongwith the revised pages shall be considered in its entirety for contractual purposes.
5. Vendors are required to quote strictly as per technical specifications / notes stipulated in the material requisition. The offers with deviations are likely to be summarily rejected.

REV	DATE	BY	CHK	APPD.	DETAILS
A	12-01-2026	AV	AV	LSJ	ISSUED FOR BIDS

This is a system generated approved document and does not require Signature

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LIST OF ATTACHMENT

SR. NO.	DOCUMENT TITLE	DOCUMENT NO.	REVISION	
			NO.	DATE
1	TECHNICAL NOTES FOR VALVES	6-44-0052	9	09-JUL-2024
2	STANDARD SPECIFICATION FOR POSITIVE MATERIAL IDENTIFICATION (PMI) AT SUPPLIER'S WORK	6-81-0001	4	23-DEC-2021
3	INSPECTION AND TEST PLAN FOR VALVES	6-81-0004	7	08-MAY-2023
4	SPECIFICATION FOR QUALITY MANAGEMENT SYSTEM REQUIREMENTS FROM BIDDERS	6-78-0001	2	12-JUN-2020
5	SPECIFICATION FOR DOCUMENTATION REQUIREMENTS FROM SUPPLIERS	6-78-0003	2	12-JUN-2020
6	ADDITIONAL TECHNICAL REQUIREMENTS	B440-003-16-43-ATR-3517	A	12-JAN-2026
7	VALVE MATERIAL SPECIFICATION FOR MR NO : 3517	B440-003-6-44-0006-3517	0	12-JAN-2026
8	MATERIAL REQUIREMENT FOR CARBON STEEL COMPONENTS USED FOR SOUR SERVICE IN PETROLEUM ENVIRONMENT REFI	6-79-0013	2	05-JUL-2019

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MR ATTACHMENT

SR.NO.	ITEMCODE	DETAIL DESCRIPTION	QTY.	U.RATE	TOT.VALUE	CDD
Item Description : VLV.GATE, SHEET 51301						
1	51301ZZZ009ZZZZZZ	2.0 INCH	4 NOS			
2	51301ZZZ015ZZZZZZ	6.0 INCH	3 NOS			
Item Description : VLV.GATE, SHEET 51302, IBR						
3	51302ZZZ111ZZZZZZ	3.0 INCH	1 NOS			
Item Description : VLV.GATE, SHEET 51311, NACE						
4	51311ZZZ209ZZZZZZ	2.0 INCH	3 NOS			
5	51311ZZZ211ZZZZZZ	3.0 INCH	9 NOS			
Item Description : VLV.GATE, SHEET 51313						
6	51313ZZZ011ZZZZZZ	3.0 INCH	7 NOS			
Item Description : VLV.GATE, SHEET 51321						
7	51321ZZZ0091ZZZZZ	2.0 INCH, LOCK OPEN	1 NOS			
8	51321ZZZ015ZZZZZZ	6.0 INCH	1 NOS			
9	51321ZZZ019ZZZZZZ	14.0 INCH	1 NOS			
Item Description : VLV.GATE, SHEET 51380						
10	51380ZZZ009ZZZZZZ	2.0 INCH	3 NOS			
Item Description : VLV.GATE, SHEET 513AF						
11	513AFZZZ0112ZZZZZ	3.0 INCH, LOCK CLOSED	2 NOS			
Item Description : VLV.GATE, SHEET 513HA, HIC1						
12	513HAZZZT091ZZZZZ	2.0 INCH, LOCK OPEN	1 NOS			
13	513HAZZZT09ZZZZZZ	2.0 INCH	1 NOS			
14	513HAZZZT111ZZZZZ	3.0 INCH, LOCK OPEN	3 NOS			
Item Description : VLV.GATE, SHEET 51401						
15	51401ZZZ009ZZZZZZ	2.0 INCH	16 NOS			
Item Description : VLV.GATE, SHEET 51466						
16	51466ZZZ009ZZZZZZ	2.0 INCH	3 NOS			
Item Description : VLV.GLOBE, SHEET 52301						
17	52301ZZZ013ZZZZZZ	4.0 INCH	1 NOS			
Item Description : VLV.GLOBE, SHEET 52313						
18	52313ZZZ009ZZZZZZ	2.0 INCH	1 NOS			

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MR ATTACHMENT

SR.NO.	ITEMCODE	DETAIL DESCRIPTION	QTY.	U.RATE	TOT.VALUE	CDD
Item Description :	***VLV.GLOBE, SHEET 52401***					
19	52401ZZZ009ZZZZZZ	2.0 INCH	1 NOS			
Item Description :	***VLV.GLOBE, SHEET 52413***					
20	52413ZZZ0092ZZZZZ	2.0 INCH, LOCK CLOSED	2 NOS			
Item Description :	***VLV.CHECK, SHEET 53301***					
21	53301ZZZ011ZZZZZZ	3.0 INCH	1 NOS			
Item Description :	***VLV.CHECK, SHEET 53402, IBR***					
22	53402ZZZ109ZZZZZZ	2.0 INCH	1 NOS			
Item Description :	***VLV.CHECK, SHEET 53439***					
23	53439ZZZ013ZZZZZZ	4.0 INCH	1 NOS			

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वाल्वों के लिए तकनीकी टिप्पणियाँ

TECHNICAL NOTES FOR VALVES

Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	
9	09.07.24	REVISED AND ISSUED AS STANDARD SPECIFICATION	PK	SH	GB	MN
8	15.02.23	REVISED AND ISSUED AS STANDARD SPECIFICATION	PK	SH	GB	SM
7	13.07.17	REVISED AND ISSUED AS STANDARD SPECIFICATION	PK	SH	MI	RN
6	04.08.10	REVISED AND ISSUED AS STANDARD SPECIFICATION	RN	ATD	SC	
5	04.07.08	REVISED AND ISSUED AS STANDARD SPECIFICATION	RN	SC	DM	VC
4	15.11.00	REVISED AND ISSUED AS STANDARD SPECIFICATION	RN	BRB	NS	MI

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Abbreviations:

AARH	:	Arithmetic Average Roughness Height
API	:	American Petroleum Institute
ASME	:	American Society of Mechanical Engineers
ASTM	:	American Society for Testing & Materials
BGO	:	Bevel Gear Operator
BHN	:	Brinnel Hardness Number
BIS	:	Bureau of Indian Standards
BS	:	British Standard
BVIS	:	Bureau Veritas Industrial Services
BW	:	Butt Weld
CAT	:	Category
CEIL	:	Certification Engineers International Limited
CS	:	Carbon Steel
DFT	:	Dry Film Thickness
DNV	:	Det Norske Veritas
DP	:	Dye-Penetrant
eDMS	:	Electronic Document Management System
IBR	:	Indian Boiler Regulations
IGC	:	Inter Granular Corrosion
IS	:	Indian Standard
ISO	:	International Organisation for Standardisation
LC	:	Lock Closed
LO	:	Lock Open
LT	:	Low Temperature
LTCS	:	Low Temperature Carbon Steel
MOV	:	Motor Operated Valve
MP	:	Magnetic Particle
MR	:	Material Requisition
NACE	:	National Association for Corrosion engineers
NDT	:	Non Destructive Testing
NPT	:	National Pipe Thread
PMI	:	Positive Material Identification
PO	:	Purchase Order
PR	:	Purchase Requisition
Ra	:	Roughness average
RFQ	:	Request for Quotation
SCRD	:	Screwed
SS	:	Stainless Steel
SW	:	Socket Weld
TUV	:	Technischer Überwachungsverein
WAFL	:	Lugged Wafer Type

Piping Standards Committee

Convenor: Mr. G. Balaji

Members:
Mr. Udayan Chakravarty
Mr. Rameshwar Prasad
Mr. K. Anjaneyulu (SMED)
Mr. Rajesh Chitara (SMMS)
Dr. Sudip Paul (Structural)
Mr. Harsh Vardhan (Projects)
Mr. P.K. Rai (Construction)

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1.0 GENERAL

1.1 Vendor shall supply valves in accordance with the valve specification sheets along with auxiliaries, if any, such as gear operator, bypasses, drains, locking etc. wherever specified in the specification sheets, subject notes and other enclosures to the material requisition (MR).

1.2 Vendor shall quote in strict accordance with the valve data / specification sheets, subject technical notes and all other enclosures to the MR. For 'Cat-I valves', no deviations whatsoever shall be accepted. For Cat-II Valves, if exceptions/ deviations become absolutely must, the same shall be requested as explained in clause 2.3.6 giving reasons for seeking such exceptions/ deviations. In case Post order concessions/ deviations are unavoidable, the request must be made by BIDDER through online system of EIL eDMS in accordance with 6-78-0001.

1.3 All codes and standards for manufacture, testing, inspection etc. shall be of latest editions as on issue date of RFQ.

1.4 In case of any conflict amongst documents attached with the MR, the most stringent shall govern and Owner's/ EIL decision shall be final in this regard.

2.0 DOCUMENTATION

2.1 All document submissions to EIL shall be through EIL eDMS.

2.2 For 'Cat-I' valves, no documents shall be submitted with the offer.

2.3 For 'Cat-II' valves, vendor shall submit the following documents with the offer:

2.3.1 Manufacturer's complete descriptive and illustrative catalogue / literature.

2.3.2 Detailed dimensioned cross section drawing with parts / material lists, weight etc.

2.3.3 Drawings for valves with accessories like gear operator, hydraulic / pneumatic operator, motor, extension bonnet, extended stems with stands, bypass etc. giving major salient dimensions and weights.

2.3.4 One copy of the valve specification sheets signed as "Accepted" by the manufacturer. Deviations, if any shall be marked as applicable on the valve specification sheet.

2.3.5 If the valve is regretted or has no deviation, the manufacturer shall write clearly on valve specification sheets as "Regret" or "No Deviation".

2.3.6 If there is any deviation, the same shall be listed clausewise.

2.3.7 On failure to submit documents as specified in clauses 2.3.1 to 2.3.6 above, the offer is likely to be rejected.

2.4 The following documents shall be submitted through eDMS of EIL after placement of the order:

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2.4.1 For Cat-I valves of size 2" and above where end-to-end/ face-to-face dimensions are to manufacturers' standards, detailed dimensioned cross section drawing with parts, materials, weight, etc. shall be submitted for records/ information.

2.4.2 For 'Cat-II' valves, Vendor shall submit for review drawings mentioned in clauses 2.3.2 & 2.3.3 before start of manufacture. No other drawings shall be submitted for review unless otherwise mentioned in MR.

2.4.3 Test report shall be supplied for all mandatory tests as per the applicable code. Test reports shall also be furnished for any supplementary tests as specified in clauses 3.13, 3.14 & 3.15.

2.4.4 Material test certificates (physical properties, chemical composition & heat treatment report including Chart) of the pressure containing parts shall be furnished for the valves supplied. Material test certificates for the other parts shall also be furnished for verification during inspection.

2.5 In addition to submissions through EIL eDMS, Catalogues/Drawings shall be in submitted in hard copies (6 sets) and soft copies (2 CDs/DVDs) along with delivery for Purchaser's record for all categories/types of valves.

3.0 DESIGN AND CONSTRUCTION

3.1 Valve shall be designed, manufactured, tested, inspected and marked as per the manufacturing standards, design codes and standards indicated in the respective valve specification sheets. Any conflict between the requisition, enclosures, specification sheets and referred standards/ codes shall be brought to the notice of the purchaser for clarifications and resolution, before proceeding with the manufacture. The purchaser's decision shall be final and binding to the vendor. The drawings submitted for review shall not include any deviations except as communicated in writing in Deviation permits. The Drawings shall be reviewed only for design and construction features.

3.2 All flanged valves shall have flanges integral (except forged valves) with the valve body. Flange face finish shall be normally specified in the valve specification sheet as 125 AARH etc. The interpretation for range of face finish shall be as follows:

Stock Finish	:	1000 μ in AARH max.
125 AARH	:	Serrations with 125 to 250 μ in AARH
63 AARH	:	32 to 63 μ in AARH

3.3 For all weld end valves with bevel end as per ASME B16.25, the contour of bevel shall be as follows:

Material	Wall Thickness	Weld Contour
Carbon Steel (Except Low Temp. Carbon Steel)	Upto 22 mm	Figure 2 Type A
	> 22 mm	Figure 3 Type A
Alloy Steel, Stainless Steel & Low Temp. Carbon Steel	Upto 10 mm	Figure 4
	> 10 mm & Upto 25 mm	Figure 5 Type A
	> 25 mm	Figure 6 Type A

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Valve ends shall match thickness of the connecting pipe. Sloping of inside contour of valves shall be done wherever necessary to achieve this.

3.4 For flanged valves with ring joint flanges the hardness shall be as follows:

Flange Material	Min. Hardness of Groove (BHN)
Carbon Steel	140
1% Cr to 5% Cr, 9% Cr	150
9Cr-1Mo-V	190
Type 304, 316, 321, 347	160
Type 304L, 316L	150
Inconel UNS N06625	220
Incoloy UNS N08825	210
Duplex SS UNS S32205, UNS S31803	250

3.5 Following requirements for check valves shall be met over and above the valve specification sheet requirements:

3.5.1 Unless specified otherwise in the data sheet all check valves 3" & above (except in Class 900, Class 1500 & Class 2500 rating) shall have a drain boss at location "G" (Refer Fig.No.1 of ASME B16.34) where pocket is formed in valve body. A tapped drain hole with plug shall be provided as per ASME B16.34. Threads shall be as per ASME B1.20.1 (Taper) NPT.

3.5.2 For heavy check valves, provisions shall be available for lifting by way of lugs, eye bolts and other such standard devices.

3.6 If an overlay weld-deposit is used for the body seat ring seating surface, the corrosion resistance of the seat ring base material shall be at least equal to the corrosion resistance of the material of the shell.

3.7 Following valve bypass requirements shall be met:

3.7.1 By-pass requirement for Gate valves shall be as follows unless otherwise mentioned.

ASME 150 Class	On sizes 26" and above
ASME 300 Class	On sizes 16" and above
ASME 600 Class	On sizes 6" and above
ASME 900 Class	On sizes 4" and above
ASME 1500 Class	On sizes 4" and above
ASME 2500 Class	On sizes 3" and above

3.7.2 The by-pass piping arrangement shall be such that clearance between main valve body and by-pass assembly shall be the minimum possible for layout reasons. Vendor shall follow the sketch enclosed in Specification No. 6-44-0052-A1.

3.7.3 By-pass valve shall be a globe valve. The sizes shall be as under:

On main valve ≤ 4" : 1/2"

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On main valve 6" to 8" : 3/4"
On main valve 10"& above : 1"

By-pass piping shall be of same metallurgy as main valve. The by-pass piping, fittings and valve tag numbers shall be as specified in Specification No. 6-44-0052-A2. In case details of by-pass arrangement for any Valve tag number is missing, Vendor shall bring the same to notice of EIL and provide by-pass as per details specified. Bends are not acceptable in place of elbows except in the location specified in 6-44-0052-A1.

3.7.4 Vendor shall supply the by-pass valve duly tested and fitted to the main valve with proper supporting from the main valve body, as required. Valves with by-pass shall have the direction of flow marked on the bypass valve only. By-pass attachment to the main valve body shall not be screwed. All fillet welds for by-pass installation shall be 100% examined by DP/MP test and Butt-weld joints shall be 100% examined by radiography.

3.8 Valve body / bonnet shall be forged / cast as specified. Forgings are acceptable in place of casting but not vice-versa.

3.9 Stem shall be forged or machined from forged / rolled bar. No casting is permitted. However, integral stem of cast material is acceptable for Plug valves.

3.10 Stelliting / hardfacing by deposition, shall be minimum 1.6 mm.

3.11 Renewable seat rings shall be seal welded for valves of size 3" and above to prevent loosening in service.

3.12 For Low Temperature & Cryogenic valve requirements, refer Specification. No. 6-44-0052-A3 unless otherwise specified.

3.13 For Hydrogen service valve requirements, refer Specification. No. 6-44-0052-A4 unless otherwise specified.

3.14 Valves under 'NACE' category shall meet the requirements specified in MR-0103 unless otherwise specified.

3.15 For all austenitic stainless steel valves Inter Granular Corrosion (IGC) test shall be conducted as per the following:

3.15.1 ASTM A262 Practice 'B' with acceptance criteria of '60 mils/year (max.)' for all materials - forged, rolled, wrought and casting.

Or

ASTM A262 Practice 'E' with acceptance criteria of 'No cracks as observed from 20X magnification' for all materials other than castings. 'Microscopic structure to be observed from 250X magnification' in addition.

3.15.2 When specifically asked for in MR for high temperature application of some grades of austenitic stainless steel (eg. SS309, 310, 316, 316H etc.) ASTM A262 Practice 'C' with acceptance criteria of '15 mils/year (max.)' shall be conducted.

3.15.3 For the IGC test as described in Clauses 3.15.1 & 3.15.2, two sets of samples shall be drawn from each solution annealing lot. One set shall correspond to the highest Carbon content and the other to the highest pressure rating. When testing is conducted as per practice 'E', photograph of the microscopic structure shall be submitted for record.

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3.16 All types of 321 or 347 stainless steel valves shall be in a stabilised heat treated condition. Stabilising heat treatment shall be carried out subsequent to the normal solution annealing. Soaking temperature and holding time for stabilising heat treatment shall be 900°C and 4 hours respectively.

3.17 Spiral wound bonnet gaskets are to be provided with inner/outer ring except when encapsulated gaskets type body-bonnet joints are employed. Outer ring may be avoided in case of non-circular spiral wound gasket used in Class 150 valve provided the outermost layer of spiral touches the bolts ascertaining the centering.

3.18 All Stainless Steel Castings shall be solution heat treated.

3.19 Only normalized and tempered material shall be used in the following specifications:

Castings : A217 Gr.WC1, A217 Gr.WC4, A217 Gr.WC5, A217 Gr.WC6, A217 Gr.WC9, A217 Gr.C5, A217 Gr.C12

Forgings : A182 Gr.F11 Cl.2, A182 Gr.F12 Cl.2

3.20 Ball / Plug / Butterfly Valves

3.20.1 As a prequalification, fire safe test as per API 607 / API 6FA / BS EN ISO 10497 (Supersedes BS 6755 Part II) shall be carried out on soft seated ball, plug & butterfly valves and also on lubricated plug valves. The test shall be witnessed and certified by a third party inspection agency like Lloyds, BVIS, DNV, TUV or EIL/ CEIL unless otherwise specified. The vendor has to submit test certificate for the particular design of the valve offered, if fire safe design is required as per the Valve Material Specification sheet.

3.20.2 Each valve shall be supplied with a lever / wrench except for gear operated / motor operated valves.

3.20.3 Soft-seated ball, plug & butterfly valves shall be supplied with antistatic devices.

3.20.4 BW / SW end ball valves shall have a 100 mm long seamless pipe nipple welded to each end of the valve. Nipples are to be welded prior to assembling soft seats / seals. Specifications of the nipples shall be as indicated in the MR.

3.20.5 The ball of ball valve shall not protrude outside the end flanges of valve.

3.20.6 Ball valves shall be of floating ball/trunnion mounted type as per following:

Class 150	8" & below	Floating ball
	10" & above	Trunnion mounted
Class 300	4" & below	Floating ball
	6" & above	Trunnion mounted
Class 600 & above	1.5" & below	Floating ball
	2" & above	Trunnion mounted

3.20.7 Unless otherwise specified in the data sheets, bore of all reduced bore ball valves shall be limited to one size lower than the nominal bore.

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3.20.8 In case of ball valves, the ball shall have a cylindrical bore and shall be of solid construction except in the case of rising stem ball valves or where otherwise specified.

3.21 Motor Operated Valves:

3.21.1 The MOVs are to be installed in an open area and the actuators shall be suitable for all weather conditions. The testing of complete assemblies of MOVs along with the actuators shall be done by the supplier at his works.

3.21.2 Vendor shall be solely responsible for selection of suitable actuators & actuator control system. Vendor shall be single point responsible for the complete system (i.e. valves, actuators, actuators control system etc.).

3.21.3 Valve with motorized actuators shall be suitable for installation in horizontal/vertical lines.

3.21.4 All MOVs shall be provided with hand wheel for manual operation.

3.22 In case flange dimension standard / Butt weld end thickness have not been specified in Valve Material Specification attached with the MR, Vendor to obtain the same from EIL and supply strictly in line with specifications.

3.23 Yoke material shall be same as bonnet material where maximum temperature specified is more than 427°C.

3.24 Face to Face / End to End Dimensions of Valves:

The Face to Face dimensions for Flanged valves and End to End Dimensions for Butt Welded Valves shall be strictly as given below unless otherwise specified in the VMS sheet. Valves with Face-to-Face/End-to-End dimensions as per Manufacturers' Standards are acceptable only where not covered in the Dimension Standards listed below.

3.24.1 Gate Valves:

Type	Face-to-Face/End-to-End Dimension
Flanged End	Dimension 'A' for Solid Wedge & Double Disc Gate Valves as per ASME B16.10
Butt Welding End	Dimension 'B' for Short Pattern Gate Valves up to the sizes covered in ASME B16.10. For sizes not covered under Short Pattern, Dimension 'B' for Long Pattern Gate Valves as per ASME B16.10 shall be followed.

3.24.2 Globe Valves:

Type	Face-to-Face/End-to-End Dimension
Flanged End	Dimension 'A' for Globe Valves as per ASME B16.10
Butt Welding End	Dimension 'B' for Short Pattern Globe Valves up to the sizes covered in ASME B16.10. For sizes not covered under Short pattern, Dimension 'B' for Long Pattern Globe Valves as per ASME B16.10 shall be followed.

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3.24.3 Check Valves:

Type	Face-to-Face/End-to-End Dimension
Flanged End Swing Check	Dimension 'A' for Swing Check Valves as per ASME B16.10
Butt Welding End Swing Check	Dimension 'B' for Short Pattern Swing Check Valves up to the sizes covered in ASME B16.10. For sizes not covered under short pattern, Dimension 'B' for Long Pattern Swing Check Valves as per ASME B16.10 shall be followed.
Lugged/Double Flanged Dual Plate Check Valves	As per API 594

3.24.4 Ball Valves:

The face-to-face dimensions of all ball valves shall be same as those of gate valves of the corresponding ASME Class rating as given in Clause 3.24.1 (except 10" onwards in Class 150 where the face-to-face dimensions shall be as per ASME B16.10 long pattern).

3.24.5 Plug Valves:

Class Rating	Face-to-Face Dimension
Class 150	Short Pattern as per ASME B16.10 up to 12" Venturi Pattern as per ASME B16.10 for above 12"
Class 300 & 600	Short Pattern as per ASME B16.10 up to 4" Venturi Pattern as per ASME B16.10 for above 4"

3.24.6 Butterfly Valves:

The face to face dimensions for butterfly valves shall be as per BS EN 558/API 609. For Class 150 Butterfly valves, Series 13 shall be followed and for Class 300 Butterfly valves, Series 14 shall be followed, unless otherwise specified.

3.25 In addition to all types of BW/SW ball valves, any other type of soft seated BW / SW end valve shall have a 100 mm long seamless pipe nipple welded to each end of the valve. Nipples are to be welded prior to assembling soft seats / seals. Specifications of the nipples shall be as indicated in the MR.

3.26 All Butt welds shall be 100% radiographed and all socket welds shall be 100% DP/MP tested.

3.27 Fugitive Emission Requirements:

Unless otherwise mentioned in VMS sheet, all valves with stem packing shall comply with the fugitive emission requirements detailed below as a pre-qualification.

3.27.1 Gate valves as per API-600 and all Gate/Globe valves as per API-602 shall comply with fugitive emission requirements of API 624.

Gate valves of Class rating 900 & above, Gate valves of size 26" & above and Globe valves of size 2" & above or valves where API-624 is not applicable due to non-graphite stem packing material, shall comply with Fugitive emission requirement of ISO-15848-1.

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3.27.2 Quarter turn valves shall comply with Fugitive emission requirement of API 641.Quarter turn valves where API-641 is not applicable due to non-graphite stem packing material, shall comply with Fugitive emission requirement of ISO-15848-1.

3.27.3 As a prequalification, Fugitive emission type test as per Cl. 3.27.1 & 3.27.2 above shall have been carried out and the test shall have been witnessed and certified by a third party inspection agency like Lloyds, BVIS, DNV, TUV or EIL/ CEIL unless otherwise specified. The vendor has to submit test certificate covering the entire range of valves to be supplied.

Vendors who do not have Fugitive emission type test certificate covering the range of valves to be supplied, shall conduct the requisite test within 12 weeks from the date of purchase order or within contractual delivery date, whichever is earlier.

In case of non-conductance of Fugitive emission type test(s) within time frame specified above or failure in the test(s) conducted after receipt of order, the owner reserves the right to invoke any of the provisions of the purchase order including cancellation of the purchase order at the risk and cost of vendor.

3.28 Valves specified as LO (Lock open) and LC (Lock closed) shall be supplied with suitable arrangement for locking in open as well as in closed position. Lock is included in vendor's scope of supply.

3.29 For Lugged Wafer Type (WAFL) Butterfly Valves, lug shall be provided for each bolt.

3.30 For butterfly valves, where bolting for tapped hole in body is being supplied by Vendor and diameter of the bolting is more than or equal to 1", the bolting supplied shall be studs to ASME B18.2.1 with two nuts.

3.31 For Gate and Globe valves, the stem surface area in contact with the packing shall have a surface finish, Ra, of 0.80μm (32μin.) or smoother, unless otherwise specified.

4.0 OPERATION

4.1 Gear operation shall be provided as under as a minimum, unless otherwise specified:

Valve Type	Class	Size Requiring Gear-Operator
Gate Valve, Globe Valve & Diaphragm Valve	150 Class	12" and larger
	300 Class	12" and larger
	600 Class	10" and larger
	900 Class	6" and larger
	1500 Class	3" and larger
	2500 Class	3" and larger
Ball Valve / Plug Valve (Other than pressure balance plug valves)	150 Class	6" and larger
	300 Class	6" and larger
	600 Class	4" and larger
Ball Valve / Plug Valve (Other than pressure balance plug valves)	900 Class	3" and larger
	1500 Class	3" and larger
Butterfly Valve	150, 300 Class	6" and larger

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For sizes lower than these ranges, hand wheel / lever / wrench shall be provided. For pressure balance plug valves manufacturer's recommendation shall be acceptable provided the requirements specified in clause 4.6 are met.

4.2 Gear operator shall be provided, with position indicators for open / close positions and with limit stops. (Limit stops are not applicable for gate valves). Gear box shall be fully encased and weather proof.

4.3 Where gear operator is not called for as per Clause 4.1 but vendor recommends a gear operator, the same shall be highlighted.

4.4 Gear operator shall be so designed as to operate effectively with the differential pressure across the closed valve equal to the cold non-shock pressure rating.

4.5 Ball, plug and butterfly valves, shall have "Open" position indicators with limit stops.

4.6 Hand-wheel diameter shall not exceed 750mm and lever length shall not exceed 500mm on either side. Effort to operate shall not exceed 35 Kg at hand-wheel periphery. However, failing to meet the above requirements, vendor shall offer gear operated valve and quote as per clause 4.3.

5.0 INSPECTION AND TESTING

5.1 Every valve shall be subjected to all the mandatory tests and checks called in the respective codes / data sheet by EIL inspection or any third party as approved by the purchaser. For IBR valves refer clause 7.0.

5.2 Every valve, its components and auxiliaries must be subjected to all the mandatory tests and checks called for in the respective codes, data sheets etc. by the manufacturer.

5.3 Though the extent of inspection shall be as under, exact extent with hold points shall be decided by EIL regional inspection office and recorded in the form of inspection plan. In case of third party inspection, the inspection plan shall be approved by the purchaser.

Forged Valves:

1. Visual and dimensional inspection.
2. Review of material test certificates.
3. Any mandatory or supplementary test.
4. Hydrostatic test on 10% valves selected on random basis.
5. Strip check is required for 1% of total ordered quantity of Gate & Globe valves (min. 1 No.) for each Valve sheet no., however, strip check is not required for CS/ Brass/ Bronze material valves with 13% Cr/ Brass/ Bronze trims.
6. Type test certificate for Fugitive Emissions as per Cl. 3.27.3.
7. Positive Material Identification
8. Type test certificates for cryogenic & Fire safe test to be submitted.

Cast Steel Valves:

1. Visual inspection with acceptance standards as per MSS SP-55 and dimensional inspection.
2. Review of material test certificates.

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3. Review of radiographs and radiographic reports or any other NDT tests wherever applicable as per data sheet.
4. Any mandatory or supplementary test.
5. Hydrostatic test 100% for body, 10% other test.
6. Strip check is required for 1% of total ordered quantity of Gate & Globe valves (min. 1 No.) for each Valve sheet no., however, strip check is not required for CS/ Brass/ Bronze material valves with 13% Cr/ Brass/ Bronze trims.
7. Type test certificate for Fugitive Emissions as per Cl. 3.27.3.
8. Positive Material Identification
9. Type test certificates for cryogenic & Fire safe test to be submitted.

Samples for strip check shall be selected at random and shall generally be in the highest size in the lot.

5.4 In case of motor operated or actuator operated valves, functional / operational checks as per the requirements of the specifications shall be made on each valve.

6.0 RADIOGRAPHY OF CAST VALVES

6.1 Valve castings shall undergo radiographic examination as specified below.

Material	Rating	Size Range	Radiography
All	Class 150	24" and below	NIL**
		26" and above*	100%
	Class 300	16" and below	NIL**
		18" and above	100%
	Class 600& above	All sizes	100%

* No radiography is required for valves of size 26" and above in cooling water service.

**For sizes 24" & below in Class 150 and 16" & below in Class 300, radiography percentage if specifically mentioned in individual valve material spec sheet shall govern.

Radiography specified as random 10% or 20% etc. in the respective valve data sheet implies 10% or 20% etc. of number of valves ordered against each item number with a minimum of one valve against each item.

6.2 Radiography procedure, areas of casting to be radiographed shall be as per ASME B16.34 and acceptance criteria shall be as per ASME B16.34. However for areas of casting to be radiographed for types of valves not covered in ASME B16.34, vendor shall radiograph castings in line with ASME B16.34.

6.3 For random radiography wherever specified in individual data sheets, the sampling shall be per size of the quantity ordered for each foundry.

6.4 Radiography wherever specified in the data sheets or as per clause 6.1 shall be done by X-ray / γ-ray to get the required sensitivity.

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7.0 IBR CERTIFICATION

7.1 For valves described "IBR", valves shall be in accordance with the latest IBR (Indian Boiler Regulation) including the requirements specified in the specification.

7.2 For SW / BW end carbon steel valves under IBR, the chemical composition shall conform to the following:

Carbon (Max)	:	0.25%
Others (S, P, Mn)	:	As per IBR

7.3 Valves coming under the purview of "IBR" (Indian Boiler Regulations) shall each be individually accompanied by IBR certificate original in Form III-C duly approved by IBR authority / local authority empowered by the Central Boiler Board of India. Photocopy of original certificate duly attested by the local boiler inspector where the supplier is located is the minimum requirement for acceptance.

7.4 All "IBR" valves shall be painted red in body-bonnet / body-cover joint.

8.0 MARKING

8.1 Valve markings, symbols, abbreviations etc. shall be in accordance with MSS-SP-25 or the standard referred in specification sheet as applicable. Vendor's name, valve rating, material designation, nominal size, direction of flow (if any) etc. shall be integral on the body.

8.2 Each valve shall have a corrosion resistant tag giving size, valve tag / code no., securely attached to the valve body.

8.3 Paint or ink for marking shall not contain any harmful metal or metal salts such as zinc, lead or copper which cause corrosive attack on heating.

8.4 Carbon Steel / Alloy Steel valves shall be painted with one coat of inorganic zinc silicate (minimum DFT 65 to 75 microns).

9.0 DESPATCH

9.1 Valve shall be dry, clean and free from moisture, dirt and loose foreign materials of any kind.

9.2 Valves shall be protected from rust, corrosion and any mechanical damage during transportation, shipment and storage.

9.3 Rust preventive on machined surfaces to be welded shall be easily removable with a petroleum solvent or shall not be harmful to welding.

9.4 Each end of valve shall be protected with the following materials:

Flange Face	:	Wood or Plastic Cover
Bevelled End	:	Wood or Plastic Cover
SW & SCRD. End	:	Plastic Cap

9.5 End protectors of wood / plastic to be used on flange faces shall be attached by at least three bolts and shall not be smaller than the outside diameter of the flange. However, plastic caps for SW & SCRD end valves shall be press fit type.

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9.6 End protectors to be used on bevelled end shall be securely and tightly attached.

9.7 For special service valves additional requirement for despatch shall be as prescribed in data sheet.

10.0 ATTACHMENTS

6-44-0052-A1	:	Bypass Piping Arrangement
6-44-0052-A2	:	Specifications for Bypass Piping, Fittings and Valves
6-44-0052-A3	:	Special Requirements for Low Temperature and Cryogenic Valves
6-44-0052-A4	:	Special Requirements for Hydrogen Service Valves

11.0 REFERENCES

6-78-0001	:	Specification for Quality management system requirements from bidders
6-78-0003	:	Specification for documentation requirements from suppliers
6-81-0001	:	Specification for Positive Material Identification (PMI) at Supplier's Works
6-81-0004	:	Inspection and Test plan for Valves

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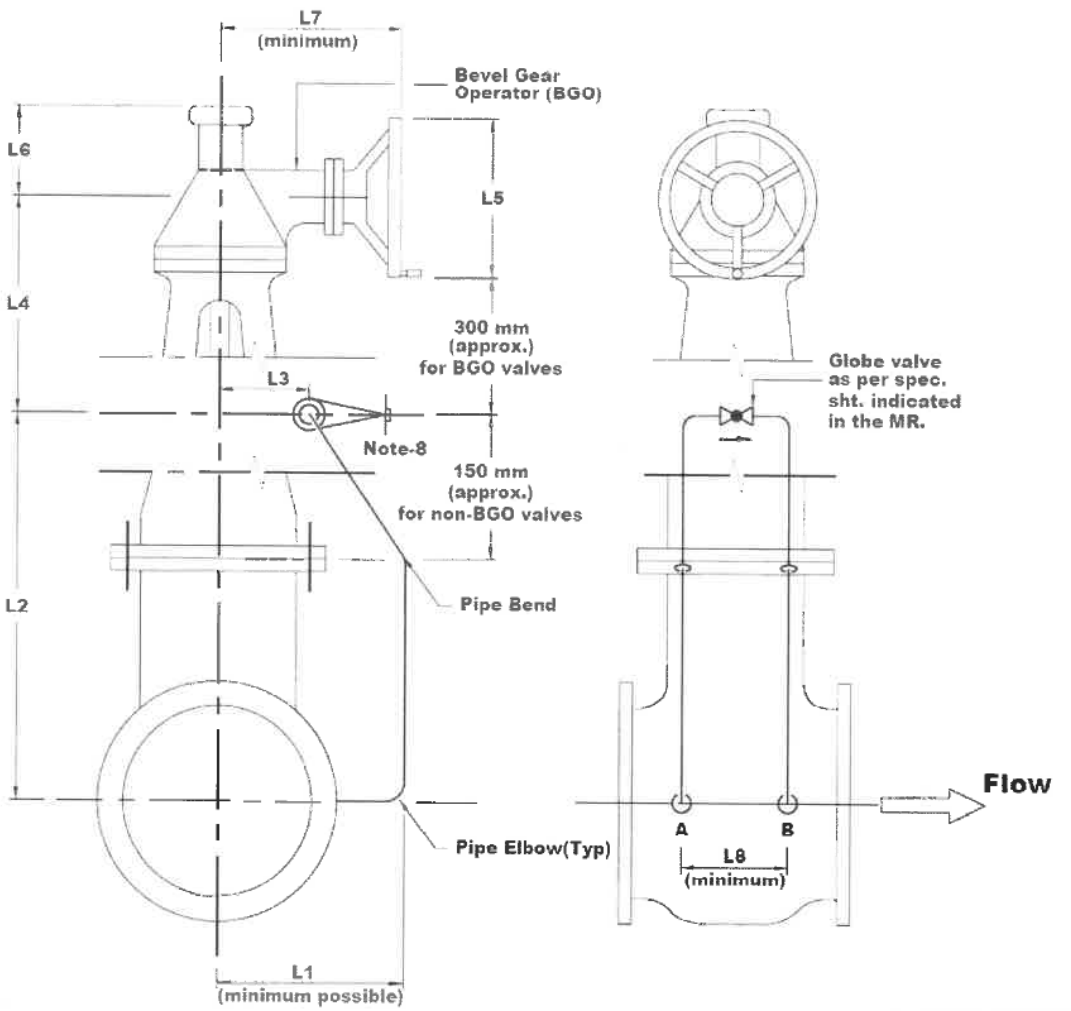
BYPASS PIPING ARRANGEMENT



NOTES:

1. The orientation & location of handwheel of bevel gear operator & the bypass arrangement shall be strictly as per this sketch.
2. The bypass connection ends including connection to boss in main valve body shall be socket welded upto 600# and butt welded for 900# and above rating.
3. The bypass arrangement shall be properly clamped to & supported by the body of the main valve.
4. Basic design of bypass shall be to MSS-SP-45.
5. Material of bypass pipe & 90° elbows shall be same or equivalent to the body material as indicated in Specification No. 6-44-0052-A2.
6. This sketch is applicable for both BGO & NON-BGO Valves.
7. Vendor shall furnish dimensions L1 to L8.
8. Stem shall not be horizontal in the case of CRYO Valves.

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SPECIFICATIONS FOR BYPASS PIPING, FITTINGS AND VALVES

Class (Main Valve Sht.no.)	Pipe	Fittings	Bypass Valve Sht.no.	Remarks
A1A(51301), A3A(51321), A39A (51321), A9A(51301), A11A(51301), A33A(51301), B1A(51401), B9A(51401), D1A(51501), D9A (51501)	ASTM A106 Gr.B (SMLS) 0.5"-1.5": S160	ASTM A105 0.5"-1.5": SW 6000#	52001	
A6A(51301), B6A(51401)	ASTM A106 Gr.B (SMLS) 0.5"-0.5" : XXS 0.75"-1.5": S160	ASTM A105 0.5"-0.5" : SW 9000# 0.75"-1.5": SW 6000#	52001	
A13A(51301), B13A(51401)	ASTM A106 Gr.B (SMLS) 0.5"-1.5" : XXS	ASTM A105 0.5"-1.5" : SW 9000#	52001	
A2A(51302), B2A(51402), D2A (51502)	ASTM A106 Gr.B (SMLS)- IBR 0.5"-0.75": S160 1.0"-1.5" : XS	ASTM A105 - IBR 0.5"-0.75": SW 6000# 1.0"-1.5" : SW 3000#	52002	
A4A (51303), B4A (51403), D4A (51503)	ASTM A333 Gr.6 (SMLS)- LT 0.5"-0.75": S160 1.0"-1.5" : XS	ASTM A350Gr.LF2CL.1-LT 0.5"-0.75": SW 6000# 1.0"-1.5" : SW 3000#	52003	
B5A (51404), D5A (51504)	ASTM A106 Gr.B (SMLS) -H2 0.5"-0.75": S160 1.0"-1.5": XS	ASTM A105 - H2 0.5"-0.75": SW 6000# 1.0"-1.5" : SW 3000#	52004	Note-1
A7A (51307)	ASTM A106 Gr.B (SMLS) 0.5"-0.75" : S160 1.0"-1.5": XS	ASTM A105 0.5"-0.75": SW 6000# 1.0"-1.5" : SW 3000#	52007	
A16A (51311), B16A (51411), D16A (51511)	ASTM A106 Gr.B (SMLS) - NACE 0.5"-0.75" : XXS 1.0"-1.5": S160	ASTM A105 - NACE 0.5"-0.75" : SW 9000# 1.0"-1.5": SW 6000#	52011	Note-1
A19A (51313), B19A (51413), D19A (51513)	ASTM A106 Gr.B (SMLS) 0.5"-1.5" : S160	ASTM A105 0.5"-1.5": SW 6000#	52013	Note-1
E1A (51601), F1A (51701)	ASTM A106 Gr.B (SMLS) 0.5"-1.5" : S160	ASTM A234 Gr.WPB/ ASTM A105 0.5"-1.5" : BW, S160	52101	
E2A (51602), F2A (51702)	ASTM A106 Gr.B (SMLS) - IBR 0.5"-1.5" : S160	ASTM A234 Gr.WPB/ ASTM A105 - IBR 0.5"-1.5" : BW, S160	52102	
E5A (51604), F5A (51704)	ASTM A106 Gr.B (SMLS) - H2 0.5"-1.5" : S160	ASTM A234 Gr.WPB/ ASTM A105 - H2 0.5"-1.5" : BW, S160	52104	Note-1
E9A (51605), F9A (51705)	ASTM A106 Gr.B (SMLS) 0.5"-1.5" : SCH XXS	ASTM A234 Gr.WPB/ ASTM A105 0.5"-1.5" : BW, SCH XXS	52105	

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Class (Main Valve Sht.no.)	Pipe	Fittings	Bypass Valve Sht.no.	Remarks
E19A (51613), F19A (51713)	ASTM A106 Gr.B (SMLS) 0.5"-1.5" : SCH XXS	ASTM A234 Gr.WPB/ ASTM A105 0.5"-1.5" : BW, SCH XXS	52113	Note-1
A5Y (51384), A33Y (51384)	ASTM A106 Gr.B (SMLS) 0.5"-0.75" : S160 1.0"-1.5": XS	ASTM A105 0.5"-0.75": SW 6000# 1.0"-1.5" : SW 3000#	52085	
B1D (51430), D1D (51530)	ASTM A335Gr.P11(SMLS) 0.5"-0.75" : S160 1.0"-1.5": XS	ASTM A182 Gr.F11Cl.2 0.5"-0.75": SW 6000# 1.0"-1.5" : SW 3000#	52030	
D2D (51531)	ASTM A335Gr.P11 (SMLS) - IBR 0.5"-0.75" : S160 1.0"-1.5": XS	ASTM A182 Gr.F11Cl.2 - IBR 0.5"-0.75": SW 6000# 1.0"-1.5" : SW 3000#	52031	Note-1
B5D (51432), D5D (51532)	ASTM 335Gr.P11(SMLS)- H2 0.5"-0.75" : S160 1.0"-1.5": XS	ASTM A182 Gr.F11Cl.2 - H2 0.5"-0.75": SW 6000# 1.0"-1.5" : SW 3000#	52032	Note-1
B1E (51433)	ASTM A335Gr.P22(SMLS) 0.5"-0.75" : S160 1.0"-1.5": XS	ASTM A182 Gr.F22Cl.3 0.5"-0.75": SW 6000# 1.0"-1.5" : SW 3000#	52033	
D5E (51534)	ASTM A335Gr.P22(SMLS) - H2 0.5"-0.75" : S160 1.0"-1.5": XS	ASTM A182 Gr.F22Cl.3 - H2 0.5"-0.75": SW 6000# 1.0"-1.5" : SW 3000#	52034	Note-1
A4F (51336), B4F (51436)	ASTM A335 Gr.P5(SMLS) 0.5"-0.75" : S160 1.0"-1.5": XS	ASTM A182 Gr.F5 0.5"-0.75": SW 6000# 1.0"-1.5" : SW 3000#	52036	Note-1
B3F (51436)	ASTM A335 Gr.P5(SMLS) 0.5"-1.5" : XXS	ASTM A182 Gr.F5 0.5"-1.5" : SW 9000#	52036	Note-1
A4G (51339), B4G (51439)	ASTM A335 Gr.P9(SMLS) 0.5"-0.75" : S160 1.0"-1.5": XS	ASTM A182 Gr.F9 0.5"-0.75": SW 6000# 1.0"-1.5" : SW 3000#	52039	Note-1
F2D (51731)	ASTM A335 Gr.P11 (SMLS) - IBR 0.5"-1.5" : S160	ASTM A234Gr.WP11Cl.1/ A182 Gr.F11Cl.2 - IBR 0.5"-1.5" : BW, S160	52131	Note-1
F2G (517GG)	ASTM A335 Gr.P91 (SMLS) - IBR 0.5"-0.75" : S160 1.0"-1.5": XS	ASTM A234Gr.WP91/ A182 Gr.F91 - IBR 0.5"-0.75" : S160 1.0"-1.5": XS	52140	Note-1
G2G (518GG)	ASTM A335 Gr.P91 (SMLS) - IBR 0.5"-1.0" : S160 1.5"-1.5": XXS	ASTM A234Gr.WP91/ A182 Gr.F91 - IBR 0.5"-1.0" : S160 1.5"-1.5": XXS	52240	Note-1
E5E (51634)	ASTM A335 Gr.P22(SMLS) - H2 0.5"-0.75" : S160 1.0"-1.5": XS	ASTM A234Gr.WP22Cl.1/ A182 Gr.F22Cl.3 - H2 0.5"-0.75" : BW, S160 1.0"-1.5" : BW, XS	52134	Note-1

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Class (Main Valve Sht.no.)	Pipe	Fittings	Bypass Valve Sht.no.	Remarks
A1K (51345), A3K (51345), B1K (51445), D1K (51545)	ASTM A312TP304(SMLS) 0.5"-0.75" : 80S 1.0"-1.5": 40S	ASTM A182 Gr.F304 0.5"-1.5" : SW 3000#	52045	
A2K (51346), B2K (51446), D2K (51546)	ASTM A312TP304(SMLS) - CRYO 0.5"-0.75" : 80S 1.0"-1.5": 40S	ASTM A182 Gr.F304 - CRYO 0.5"-1.5" : SW 3000#	52046	
B4K (51448), B5K (51448)	ASTM A312TP304H(SMLS) 0.5"-1.5" : 80S	ASTM A182 Gr.F304H 0.5"-1.5": SW 3000#	52048	
A6K (51350), A11K (51350), B6K (51450)	ASTMA312TP304L(SMLS) 0.5"-0.75" : 80S 1.0"-1.5": 40S	ASTM A182 Gr.F304L 0.5"-1.5": SW 3000#	52050	
A1M (51361), B1M (51461)	ASTM A312 TP316(SMLS) 0.5"-0.75" : 80S 1.0"-1.5": 40S	ASTM A182 Gr.F316 0.5"-1.5": SW 3000#	52061	
B5M (51462)	ASTMA312TP316H(SMLS) - H2 0.5"-0.75" : 80S 1.0"-1.5": 40S	ASTM A182 Gr.F316H - H2 0.5"-1.5": SW 3000#	52062	
B3M (51463)	ASTM A312 TP321(SMLS) 0.5"-0.75" : 80S 1.0"-1.5": 40S	ASTM A182 Gr.F321 0.5"-1.5": SW 3000#	52063	
A1N (51366), B1N (51466)	ASTMA312TP316L(SMLS) 0.5"-0.75" : 80S 1.0"-1.5": 40S	ASTM A182 Gr.F316L 0.5"-1.5": SW 3000#	52066	
B6N (51471)	ASTM A312 TP316L (SMLS) 0.5"-0.75" : 80S 1.0"-1.5": 40S	ASTM A182 Gr.F316L 0.5"0.5"-1.5": SW 3000#	52071	

In case specifications for bypass of any specific VMS sheets are not available in the MR, Vendor to obtain the same from EIL and supply strictly in line with specifications.

Notes:

1. All welded joints shall be post weld heat treated. Procedure for Post weld heat treatment shall be in accordance with ASME B31.3.

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SPECIAL REQUIREMENTS FOR LOW TEMPERATURE & CRYOGENIC VALVES

1.0 SCOPE

All valves of Low Temperature Carbon Steel (LTCS) and all grades of austenitic SS (CRYO) material are categorized as cryogenic valves. All these valves shall have extended bonnet. The bonnet extension shall be as per VMS sheets (BS 6364/ BS EN ISO 28921-1) except check valves.

2.0 QUALIFICATION CRITERIA

For Limited Enquiries (Non NIT enquiries)

2.1 Vendors who satisfy both the requirements given below shall be considered qualified :

a. Vendor should be enlisted with EIL for any cryogenic valve irrespective of type, size, rating and metallurgy

b. Vendors should be enlisted with EIL for the same type, material, size and rating of non-cryogenic/cryogenic valve as the cryogenic valve quoted for

2.2 Qualified Vendors who do not have cryogenic test reports covering the range of Cryogenic valves quoted for, shall conduct cryogenic test per clauses 3.0 within 12 weeks from the date of purchase order.

2.3 Clauses 2.1 and 2.2 of this Annexure shall be read in conjunction.

3.0 CRYOGENIC TEST

3.1 Vendors to furnish copies of cryogenic test certificate for tests as per details given below:

3.1.1 Test shall be as per VMS sheets (BS 6364/ BS EN ISO 28921-2).

3.1.2 Test temperature, unless specifically called for otherwise in the individual MR, shall be -45°C for LTCS and -196°C for all grades of austenitic stainless steel.

3.1.3 Tests carried out on a particular size of one type of valve, pressure rating and material shall qualify all sizes equal to and below the test valve size for the same type, pressure rating and material. In case of austenitic SS any one grade would qualify for all other grades of austenitic SS.

3.1.4 Tests should have been witnessed and certified by any third party inspection agencies like M/s Lloyd, BV, DNV, TUV or EIL/ CEIL.

3.1.5 Test conducted previously and witnessed by inspection agencies listed above shall be considered acceptable and need not be repeated.

3.2 Post Order Testing Procedure

3.2.1. Before conducting post order testing, vendor shall obtain approval for the following from TPIA:

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a. Test procedure and Schematic of test rig with complete details as per standard specified in VMS sheet (BS 6364/ BS EN ISO 28921-2).

b. Cross-section drawing of the valve with material of construction.

3.2.2. Test has to be conducted irrespective of the service on largest size for each type of valve and for each material and class rating. Vendor shall offer one, two or three valves for selection of test valve by inspector depending upon whether quantity of largest valve in the order is one, two or three and more than three respectively.

In the event of failure of the test valve to meet the specification requirements, the vendor shall conduct test on two more valves. These two valves which pass test successfully, are of lower size, then the qualification will be valid only to sizes upto which test has been conducted successfully.

3.2.3. In case of non-conductance of cryogenic test(s) within 12 weeks or failure in the test(s) conducted after receipt of order, the owner reserves the right to invoke any of the provisions of the purchase order including cancellation of the purchase order at the risk and cost of vendor.

4.0 Bonnet extension, wherever specified in the valve sheet shall be for "non cold box application" unless otherwise specified in the MR. Even if not called for in VMS, valves indicated as "LT" or "CRYO" shall be supplied with bonnet extension.
If the valves are supplied in accordance with BS EN ISO 28921-1, Bonnet extension in LT service shall be as per values specified for -51 Deg.C to -109 Deg.C.

5.0 Bonnet and Gland extension joints shall be of butt welded/integrally cast construction.

6.0 Repair welding procedure for austenitic stainless steel valves in "CRYO" service shall have to be qualified for impact test as per ASME B31.3. Minimum acceptable impact energy shall be 20 J or lateral expansion of 0.38 mm at temperature of -196°C.

7.0 Wherever impact test of SS studs / nuts is called for in the data sheet, the impact value shall be 27 J at the intended service temperature specified in the data sheets.

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SPECIAL REQUIREMENTS FOR HYDROGEN SERVICE

1.0 GENERAL

1.1 These requirements are applicable for valves used in Hydrogen service. These are in addition to the requirements described in "Technical Notes for Valves" Spec. No. 6-44-0052, and shall be read in conjunction with this specification.

1.2 All cast valve flanges & bodies with flange rating of Class 900 or greater shall be examined in accordance with paragraphs 7.2 through 7.5 of Appendix-VII of ASME SEC-VIII, DIV.1, regardless of casting quality factor.

1.3 Body / bonnet / cover joints & stuffing box of all valves shall have low emission. One valve per metallurgy, per rating, per size shall be helium leak tested as per ASME Sec.V, Subsection A, Article 10 (Detector Probe Technique), Appendix IV at a minimum of 25% of the allowable (rated) cold working pressure. Selection of valves for helium leak test shall be at random. Test duration shall be as follows:

Test Duration in Minutes					
Nominal Size	Pressure Class				
	Upto 300	600	800 & 900	1500	2500
Upto 2"	3	6	9	12	12
3" to 6"	6	9	12	15	18
8" to 16"	9	9	12	15	18
18" to 24"	9	12	15	18	21

The valve shall show no leakage. No leakage is defined as a total leakage rate of less than 0.0001 ml/s of helium.

2.0 Only normalized and tempered material shall be used in the following specifications:

Castings : A217 Gr.WC1, A217 Gr.WC4, A217 Gr.WC5, A217 Gr.WC6, A217 Gr.WC9, A217 Gr.C5, A217 Gr.C12

Forgings : A182 Gr.F11 Cl.2

3.0 CS & AS VALVES

3.1 Bend test and Magnetic Particle inspection of the entire surface of body and bonnet casting shall be in accordance with ASTM A217. Supplementary requirement S3 & S4 evaluation of magnetic particle, inspection shall be in accordance with MSS-SP-53 except that no linear discontinuities shall be allowed.

3.2 The Brinell hardness of heat treated casting shall not exceed 200 BHN for carbon steel & 225 BHN for alloy steel.

3.3 Repair to defective casting shall be outlined in writing to the purchaser before repair starts. Repair method to be approved prior to welding.

3.4 Casting shall be preheated to a minimum of 400°F prior to welding and all Chromium-Molybdenum alloys shall be postweld heat treated after welding is complete. Stress relieving is essential for welds.

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3.5 Carbon steel shall be normalised and alloy steels shall be normalised & tempered.

3.6 Dye Penetrant test of welds shall be in accordance with ASTM B165 Procedure B-2. Interpretation as per Appendix-8 of ASME-VIII Div.1.

3.7 The tensile stress for AS shall be less than 100,000 psi.

3.8 Charpy V-notch impact testing is to be done for valve material (average 20 ft-lb for set of 3 [minimum value 15 ft-lb] at 30°F).

3.9 For radiography and acceptance criteria for valve castings, refer Cl. 4.2.

4.0 SS VALVES

4.1 Valve casting shall be in solution heat treated and pickled condition.

4.2 Critical body and bonnet casing section typically defined by ASME B16.34 shall be radiographed and shall meet ASTM E446 (upto 2" thick) Category A, B & CA Level 2, Category CB, OC & CD Level 3, Category D, B & F Level 0. For wall thickness 2" to 4.5" comparable plates of ASTM E186 shall be used. ASTM E94 and ASTM E142 shall be used for recommended practice & controlling quality of radiography as guide. The entire surface of all castings shall be dye-penetrant inspected after pickling.

4.3 Repair Welds shall be 100% radiographed and evaluated in accordance with paragraph 344.5 of ASME B31.3 with a minimum casting quality factor of 0.95. Dye Penetration test shall be as per ASTM E165 Procedure B-2, Interpretation as per Appendix-8 of ASME-VIII Div.1.

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विक्रेता कार्यशाला में सकारात्मक सामग्री पहचान के लिए मानक विनिर्देश

STANDARD SPECIFICATION FOR POSITIVE MATERIAL IDENTIFICATION (PMI) AT SUPPLIER'S WORKS

Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	
4	23.12.21	REVISED AND RE-ISSUED	HKM	CS	RK	S Majumdar
3	19.09.16.	REVISED AND RE-ISSUED	TKK	HP	RKS	RN
2	20.10.11	REVISED AND RE-ISSUED	RKS	SCG	AKC	DM
1	15.07.08	REVISED AND RE-ISSUED	NKR	SSL	SKP	VC
0	07.12.00	ISSUED AS STANDARD SPECIFICATION	AKC	AKB	AKB	MI

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Abbreviations:

API	:	American Petroleum Institute
AS	:	Alloy Steel
HIC	:	Hydrogen Induced Cracking
LSTK	:	Lump Sum Turn Key
NACE	:	National Association of Corrosion Engineers
PMI	:	Positive Material Identification
RTJ	:	Ring Type Joint
Sch	:	Schedule
SS	:	Stainless Steel
TPI or TPIA	:	Third Party Inspection Agency

Inspection Standards Committee

Convenor: Mr. Rajeev Kumar

Members: Mr. Rajesh Sinha
Mr. Himangshu Pal
Mr. R. Muthuramalingam (RPO Representative)
Mr. Chandrashekhar
Mr. Avdhesh Agrawal
Mr. P V Satyanarayana (Engg. Representative)
Mr. Mahendra Mittal

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1.0 SCOPE

1.1 This specification applies to the requirements for Positive Material Identification (PMI) to be performed at the Supplier's works on Metallic Materials procured either directly by the Owner/EIL/ LSTK contractor or indirectly through the sub-Suppliers.

1.2 This specification covers the procedures and methodology to be adopted to assure that the chemical composition of the material is consistent with the material specifications as specified in purchase documents using 'Alloy Analyzer' at the time of final inspection before dispatch.

1.3 The scope of this specification shall include but shall not be limited to Positive Material Identification (PMI) to be performed on Materials listed below:

1.3.1 For alloy Steel materials as below:

- Alloy Steel Pipes including Clad Pipes
- Alloy Steel Flanges & Forgings
- Alloy Steel Fittings including Clad Fittings
- Alloy Steel Fasteners
- Alloy Cast & Forged steel valves
- Alloy Steel Instrumentation Items (Control Valves, Safety Valves etc.)
- Longitudinal Pipe & Fittings Welds.
- Gaskets (for Ring Type Joints)

1.3.2 For Carbon Steel materials as below:

- All Carbon Steel Piping items under NACE or HIC or H2 or Wet Hydrogen Sulfide (H_2S), Hydrofluoric acid (HF), Sulfuric acid (H_2SO_4) services etc.
- Carbon Steel flanges and valves (Rating 900# and above)
- LTCS items

Following items shall be excluded from scope of PMI examination.

- Gaskets other than for Ring Type Joints
- Internal Components of Valves

1.4 All grades of material supplies including Stainless Steels shall be liable for PMI test at site. In case of any defective materials being found at site, the Supplier shall be responsible to effect replacement of such defective materials at project site without any delays to the satisfaction of EIL site RCM (Resident Construction Manager).

2.0 REFERENCE DOCUMENTS

2.1 API Recommended Practice 578 (Third Edition, Feb 2018) - Material Verification Program for New and Existing Alloy Piping Systems.

3.0 DEFINITIONS

3.1 **Supplier:** Any Supplier or Manufacturer on whom an order is placed for the supply of referred items. This definition shall also include any sub-Supplier or manufacturer on whom a sub-order is placed by the Supplier.

3.2 **Inspection Lot:** A group of items offered for inspection covered under same size, Heat and Heat treatment lot.

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3.3 **Alloy Material:** Any metallic material (including welding filler materials) that contains alloying elements such as Chromium, Nickel, Molybdenum or Vanadium, which are intentionally added to enhance mechanical or physical properties and/or corrosion resistance.

4.0 PMI EXAMINATION

4.1 The Supplier shall submit a procedure of PMI to comply with the requirements of this Specification. Approval of PMI Procedure shall be obtained from Owner / EIL / TPIA prior to commencing manufacture / inspection of product.

4.2 PMI examination of materials is independent of any certification, markings or colour coding that may exist and is aimed at verifying that the alloy used are as per specified grades.

4.3 The Supplier shall identify all incoming alloy materials and maintain full traceability of all alloy
materials, including all off-cuts. Transfer of identification marks shall be undertaken prior to cutting to ensure maintenance of identification on off-cuts.

4.4 The Supplier shall ensure that all alloy materials are segregated and stored in separately identified locations to prevent the mix up of materials of different alloy specifications or alloy material with carbon steel. Non ferro-magnetic materials shall be segregated at all times from ferro-magnetic materials.

4.5 PMI examination is subject to surveillance inspection by Owner / EIL / TPIA.

5.0 ACCEPTABLE METHODS FOR PMI

5.1 The method used for PMI examination shall provide a quantitative determination of the alloying elements like Chromium, Nickel, Molybdenum or Vanadium in Alloy Steel items.

5.2 Instruments or methods used for PMI examination shall be able to provide quantitative, recordable, elemental composition results for positive identification of alloying elements present.

5.3 The acceptable instruments for alloy analyzer shall be either "Portable X-Ray fluorescence" or "Optical Emission" type each capable of verifying the percentage of alloy elements within specified range.

5.4 Chemical spot testing, magnets, alloy sorters and other methods using eddy current or triboelectric testing methods are not acceptable for PMI examination.

5.5 The PMI instrument used shall have the sensitivity to detect the alloying elements in the specified range.

5.6 All PMI instruments shall have been serviced within a 6 month period of the time of use to verify the suitability of batteries, sources etc., and the data of the last service shall be stated on the PMI Report Form (Sample enclosed).

5.7 Each analyzer must be calibrated according to the manufacturer's specification at the beginning and end of each shift. Instrument must be checked against known standard for each alloy type to be inspected during the shift.

5.8 Certified samples, with full traceability, of a known alloy materials shall be available for use as a random spot check on the instrument calibration.

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5.9 The surfaces to be examined shall be prepared by light grinding or abrasive paper and solvent cleaner. Evidence of Arc burn resulting from examination shall be removed by light grinding or abrasive paper. No permanent marks, which are injurious to the usage of product in service, are acceptable.

5.10 Alloy Steel ring type joint Gaskets shall be inspected by using portable X-Ray fluorescence instrument.

5.11 Testing shall be done as per the procedures outlined by the manufactures of alloy analyzer being used. Modification of these procedures if any must be approved by Owner/EIL.

5.12 The persons performing PMI shall demonstrate their capabilities to the satisfaction of Owner/EIL/TPIA visiting engineer. If the Supplier has qualified operator on their rolls, he may perform the examination. Otherwise PMI examination shall be sub-contracted to an independent testing agency approved by EIL.

5.13 Whenever material is identified as not meeting requirements by the visiting engineer a rejection note shall be issued.

6.0 EXTENT OF PMI EXAMINATION

Following sampling plans shall be applicable for PMI examination of various items.

A. Flanges, Fittings Valves, RTJ Gaskets - 100% by Supplier and 10% @ random witness by EIL/TPIA

B. Pipes - 100% (for pipes procured from traders)
2 random samples drawn from each Size/Heat/Lot (for pipes procured directly from mills)

C. Fasteners -

Lot Size	**Sample Size for** EIL/TPIA	Sample size for Supplier
Upto 100	2% (Min 2)	Min 10%
101 to 500	1% (Min 3)	Min 10%
501 and above	0.5% (Min 5)	Min 10%

Note:

a. For Welded Pipes and Fittings and flanges like Fig 8, Spacer and blinds etc. PMI shall be performed on Base Metal as well as weldments.

7.0 ACCEPTANCE CRITERIA

7.1 Base Metal

PMI test results showing presence of characteristic elements upto 10% less than the minimum specified value in the material specification and upto 10% more than the maximum specified value in the material specification shall be acceptable.

7.2 Deposited Weld Metal

For deposited weld metal using welding consumables matching with base metals, the recorded presence of characteristic elements upto 12.5% less than the minimum specified value in the

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welding consumable specification and upto 12.5% more than the maximum specified value in the welding consumable specification shall be acceptable.

8.0 REJECTION CRITERIA

8.1 If PMI test results fall outside the acceptable range as specified in 7.0 above, the supplier shall obtain a quantitative check analysis performed by a laboratory acceptable to Owner / EIL / TPIA for a complete chemical analysis. Alternatively, the item can be tested with a spark analyser for verification. Results of this analysis shall be submitted to Owner / EIL / TPIA for final decision.

Decision of Owner / EIL / TPIA shall be final in this regard.

8.2 If any sample drawn to PMI test on the basis of percentage selection as per 6.0 above, fails to meet specification requirements, 100% of items of lot shall be tested for PMI by supplier. Any failure thereafter during sample check shall mean rejection of whole lot.

9.0 RECORDING AND DOCUMENTATION

The results of PMI examination shall be recorded in a Report Format as enclosed with this specification.

10.0 MARKING

10.1 All alloy materials tested by PMI shall be identified using either of the following methods by indicating "PMI OK"

a) Bar Code/Hologram Sticker
b) A low stress stamp marking

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	POSITIVE MATERIAL IDENTIFICATION REPORT BULK MATERIALS								Page of
Project:			Client						Job No.
PMI Report No.			Supplier/Sub-Supplier						
Purchase Order No.			Testing Agency						
Purchase Requisition No:			PMI Location						
Bulk Item Type (as per Requisition)									
Material Specification/Grade Number of items in Lot									
Requisition Item No./ Description			Major content, Weight Percent						Remarks Accept/Reject
Element	Cr	Ni	Mo	V	Ti *	Cb/ Nb **	Mn ***		
Specified Range									
Actual observations 1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
Instrument Type / ID Last Service Date		Inspection Agency							Witnessed By

* To be reported in case of SS321 Material
** To be reported in case of SS347 Material
*** To be reported in case of LTCS Material

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वाल्वों के लिए
निरीक्षण एवं परीक्षण योजना

INSPECTION AND TEST PLAN
FOR
VALVES

Rev. No.	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	
7	08.05..2023	REVISED AND RE-ISSUED	NK	AK	RK	SM
6	14.11.2018	REVISED AND RE-ISSUED	KC	NM	RKS	RKT
5	17.06.2013	REVISED AND RE-ISSUED	TKK	RKS	SCG	DM
4	15.07.2011	REVISED AND RE-ISSUED	TKK	SCG	AKC	DM
3	30.06.2010	REVISED AND RE-ISSUED	RKB	VKJ	SKP	ND
2	31.01.2008	REVISED AND RE-ISSUED	CS	SS	MVKK	VC

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Abbreviations:

CEIL	:	Certification Engineers International Limited	MRT	:	Mechanical Run Test
CIMFR	:	Central Institute of Mining & Fuel Research	NDT	:	Non Destructive Testing
CE	:	Carbon Equivalent	NPSH	:	Net Positive Suction Head
DFT	:	Dry Film Thickness	PO	:	Purchase Order
DPT	:	Dye Penetrant Testing	PESO	:	Petroleum Explosive Safety Organization
DHT	:	De-hydrogen Heat Treatment	PQR	:	Procedure Qualification Record
ERTL	:	Electronics Regional Test Laboratory	PR	:	Purchase Requisition
FCRI	:	Fluid Control Research Institute	PMI	:	Positive Material Identification
HT	:	Heat Treatment	RT	:	Radiography Testing
HIC	:	Hydrogen Induced Cracking	SSCC	:	Sulphide Stress Corrosion Cracking
ITP	:	Inspection and Test Plan	TC	:	Test Certificate
IP	:	Ingress Protection	TPI or TPIA	:	Third Party Inspection Agency
IHT	:	Intermediate Heat Treatment	UT	:	Ultrasonic Testing
IC	:	Inspection Certificate	VDR	:	Vendor Data Requirement
IGC	:	Inter Granular Corrosion	WPS	:	Welding Procedure Specification
MPT/MT	:	Magnetic Particle Testing	WPQ	:	Welders Performance Qualification
MTC	:	Material Test Certificate			

Inspection Standards Committee

Convenor : Mr. Rajeev Kumar

Members:

Mr. Rajesh Sinha	Mr. Himangshu Pal	Mr. Chandrashekhar	Mr. R Muthu Ramalingam (RPO Rep.)
Mr. Avdhesh Agrawal	Mr. Mahendra Mittal	Ms Sulakshna Hundekari (Piping)	

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1.0 SCOPE

This Inspection and Test Plan covers the minimum testing requirements of Valves.

2.0 REFERENCE DOCUMENTS

PO/PR/Standards referred therein/ Job specifications /Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS

SL NO	STAGE / ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
1.0	**Procedure**						
1.1	Hydrostatic Test, Heat Treatment, NDT, Helium Leak Test, Fugitive Emission Test, Internal/ External Coating Procedures & Other Procedures (Wherever applicable as per MR/ PR)	NDT Level III Approved Documented Procedures	100%	NDT Level III Approved Procedure Documents	-	H	R
1.2	WPS, PQR & WPQ and NDT operator Qualification Record	Welding Parameters & Qualification Record	100%	WPS, PQR &WPQ	-	H	W- New R- Existing

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SL NO	STAGE / ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
1.3	Pre-Qualification Tests	Fire safe, Cryogenic, Fugitive Emission Test, Internal Epoxy Coating, Glass Lined Coating & Other Test as applicable	As per PR / Purchase Specification	Acceptance Report	-	H	H (If new)
2.0	**Material Inspection**						
2.1	Castings & Forgings (Body, Bonnet, Disc, Stem, Body ring)	Chemical, Mechanical (Tensile, Hardness, Impact Test etc.), Heat Treatment, NDT, IGC & Other Properties as applicable	100%	Test Certificates	H	R	R
2.2	Castings & Forgings (Body, Bonnet, Disc, Stem, Body ring)	Visual & Dimension	100%	Inspection Report	H	H	-
2.3	Body and Bonnet Castings	Radiography Examination after Heat Treatment	As per PR / Purchase Specification	RT Films and NDT reports	H	R	R
2.4	Bars for Trim material	Chemical Analysis	Each Heat	Test Certificates & Lab Report	H	R	-

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SL NO	STAGE / ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
2.5	Gaskets, Gear units, Fasteners, Gland, Packings, etc.	Physical / Chemical Properties	100%	Test Certificates & Lab Report	H	R	-
2.6	Actuators as applicable	Performance, Statutory Certificates etc. As per EIL ITP. 6-81-1091	100%	Test Certificates, Inspection report	H	H	R
3.0	**In Process Inspection**						
3.1	Welding, Weld Overlay, Stelliting, Hardfacing (As applicable)	Welding Parameters as per WPS / PQR	100%	Inspection Reports	-	H	-
3.2	Machining of components	Visual / Dimension	100%	Inspection Reports	-	H	-
3.3	DP Test for all weld joints, Bevel Ends & Bypass (as applicable)	Dye Penetrant Test	100%	NDT Report	-	H	RW
3.4	Hardness Check	Heat Treat Castings, Weld Joints, Grove Joints etc.	100%	Inspection Reports	-	H	R
4.0	**Final Inspection**						

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SL NO	STAGE / ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
4.1	a. Shell Hydrotest b. Seat Hydro Test (Both Sides) c. Backseat Hydrotest (Gate & Globe Valves) d. Seat Pneumatic/ Air Test	Leak Check	100%	Pressure Test Report, Water quality Report		H	RW (Note 1)
4.2	Helium Leak test / Vacuum Test (as applicable)	Leak Check	As per PR / Purchase Specification	Test Report	-	H	RW (Note 1)
4.3	Visual & Dimensional Check	Surface Verification & Dimension Measurement	100%	Test Report	-	H	RW (Note 1)
4.4	Functional Test for Motor/ Actuator Operated Valves	Satisfactory Performance	100%	Test Report	-	H	RW
4.5	Marking Verification	Verification of Marking, Valve Tagging & Name Plate Checking	100%	Marking & Tagging Report		H	RW (Note-1)
4.6	PMI Check	Chemical Check	As per EIL Spec. 6-81-0001	PMI Report	-	H	RW

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SL NO	STAGE / ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
4.7	Strip Check (As applicable)	Verify Components for wear, damage , harmful defects & Differential hardness as applicable	As per PR / Purchase Specification	Inspection Report	-	H	RW (Note-1)
4.8	Final Stamping	Stamping of Accepted Valves	Stamping of Valves which are witnessed by EIL/TPIA.	Inspection Report	-	H	H (Note-1)
5.0	**Painting**						
5.1	Painting/ Pickling & Passivation and Color coding as applicable	Visual / DFT Check	100%	Inspection Report	-	H	-
6.0	**PACKING & PROTECTION**						
6.1	Packing & Protection	Dispatch Instructions as per Technical Notes for Valves	100%	Compliance Report with photographs		H	RW
7.0	**Documentation & Inspection Certificate**						

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SL NO	STAGE / ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	EIL/TPIA
7.1	Documentation & Inspection Certificate (IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Supplier TC & IC	-	H	H

Legend: H- Hold (Do not proceed without approval), P-Perform, RW - Random Witness (As specified or 10% (min.1 no. of each size and type of Bulk item)), R-Review, W-Witness (Give due notice, work may proceed after scheduled date).

NOTES (As applicable):

1. Non NACE & Non Hydrogen service Carbon Steel Cast Valves up to size 12"-300ANSI Class and Carbon Steel Forged Valves up to size 1.5"- 800 ANSI Class will be accepted on review of Supplier Test Certificates.
   Supplier Test Certificate along with back up reports to be reviewed by EIL/TPIA.
2. This document describes the generic test requirements. Any additional test or Inspection scope if specified in contract documents shall also be applicable. (Unless otherwise agreed upon)
3. Acceptance Norms for all the activities shall be as per PO/PR/STANDARDS referred therein /Job Specification /Approved Documents.

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SPECIFICATION FOR QUALITY MANAGEMENT SYSTEM REQUIREMENTS FROM BIDDERS / SUPPLIERS / CONTRACTORS

Rev. No.	Date	Purpose	Prepared by	Checked by	Approved by: Standards Committee Convener	Approved by: Standards Bureau Chairman
3	29-09-2025	General Revision	QMS Standards Committee	QMS Standards Committee	AK	MN
2	12-06-2020	General Revision	QMS Standards Committee	QMS Standards Committee	SKB	SKS
1	12-03-2015	General Revision	QMS Standards Committee	QMS Standards Committee	MPJ	SC
0	04-06-2009	Issued as Standard Specification	QMS Standards Committee	QMS Standards Committee	SCT	ND

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Abbreviations:

EIL	Engineers India Limited
ISO	International Organization for Standardization
MR	Material Requisition
PO	Purchase Order
PR	Purchase Requisition
QMS	Quality Management System

QMS Standards Committee

Convener: Mr. Anil Kumar

Members: Mr. Himangshu Pal (SCM-Inspection)
Mr. Ravindra Kumar (Const.)
Mr. Vinod Kumar (CQA)
Mr. Swapnil Vaishnav (Projects)
Mr.Vijay Kumar Garg (SCM)
Mr.Raju Kumar Pandey (Equipment Division)

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1.0 SCOPE

This specification establishes the Quality Management System requirements to be met by BIDDER for following purpose:

- QMS requirements to be met by suppliers/contractors after award of work/duringcontract execution.

2.0 DEFINITIONS

2.1 Bidder

For the purpose of this specification, the word "BIDDER" means the person(s), firm, company or organization who is under the process of being contracted by EIL / Owner for delivery of some products (including service).The word "Bidder" is considered synonymous to supplier, contractor or vendor.

2.2 Project Quality Plan (PQP)

Document tailored from Standard Quality Management System Manual of BIDDER, specifying how the quality requirements of the project will be met.

2.3 Owner

Owner means the owner of the project for which services / products are being purchased and includes their representatives, successors and assignees.

3.0 REFERENCE DOCUMENTS

- Specification for Documentation Requirements from Contractors (Doc. No. 6-78-0002)
- Specification for Documentation Requirements from Suppliers (Doc. No. 6-78-0003)

4.0 QUALITY MANAGEMENT SYSTEM – GENERAL

Unless otherwise agreed with EIL / Owner, the BIDDER proposed quality system shall fully satisfy all relevant requirements of ISO 9001 "Quality Management Systems – Requirements."Evidence of compliance shall be current certificate of quality system registration to ISO 9001 or a recent compliance audit recommending registration from a certification agency.The quality system shall provide the planned and systematic control of all quality related activities for execution of contract.Implementation of the system shall be in accordance with BIDDER'S Quality Manual and PROJECT specific Quality Plan.

5.0 QUALITY SYSTEM REQUIREMENTS

5.1 BIDDER shall prepare and submit for review / record, Project Quality Plan / Quality Assurance Plan for contracted scope / job.The BIDDER'S Quality Plan shall address all of the applicable elements of ISO 9001, identify responsible parties within BIDDER'S organization, for the implementation / control of each area, reference the applicable procedures used to control / assure each area, and verify the documents produced for each area.The Project Quality Plan shall necessarily define control or make reference to the relevant procedures, for design and engineering, purchase, documentation, record control, bid evaluation, inspection, production/manufacturing, preservation, packaging and storage, quality control at construction site, pre-commissioning, commissioning and handing over (as applicable) in line with contract requirement and scope of work.

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5.2 BIDDER shall identify all specified or implied statutory and regulatory requirements and communicate the same to all concerned in his organization and his sub contractor's organization for compliance.

5.3 BIDDER shall deploy competent and trained personnel for various activities for fulfilment of PO / contract.BIDDER shall arrange adequate infrastructure and work environment to ensure that the specification and quality of the deliverable are maintained.

5.4 BIDDER shall do the quality planning for all activities involved in delivery of order.The quality planning shall cover as minimum the following:

- Resources
- Product / deliverable characteristics to be controlled.
- Process characteristics to ensure the identified product characteristics are realized
- Identification of any measurement requirements, acceptance criteria
- Records to be generated
- Need for any documented procedure

The quality planning shall result into the quality assurance plan, inspection and test plans (ITPs) and job procedures for the project activities in the scope of bidder. These documents shall be submitted to EIL/Owner for review/approval, before commencement of work.

5.5 Requirements for sub-ordering of outsourced items /sub-contracting / purchasing of services specified in MR/ contract / tender shall be adhered to. In general all outsourced items will be from approved vendors of EIL. Wherever requirements are not specified, or approved sub vendors do not exist, the sub-contractor shall establish and maintain a system for purchasing / sub-contracting to ensure that purchased product / service conforms to specified requirements in concurrence with EIL / Owner.Criteria for selection of sub-contractor, evaluation, re-evaluation, maintenance of purchasing data and verification of purchased product (sub-contractor services), constitute important components of this requirement.

5.6 BIDDER shall plan and carry production and service provision under controlled conditions.Controlled conditions shall include, as applicable

a) the availability of information that describes the characteristics of the product
b) the availability of work instructions
c) the use of suitable equipment
d) the availability and use of monitoring and measuring devices
e) the implementation of monitoring and measurement
f) the implementation of release, delivery and post-delivery activities

5.7 BIDDER shall validate any processes for production and service provision where resulting output cannot be verified by subsequent monitoring and measurement. This includes any process where deficiencies become apparent only after the product is in use or service has been delivered.

5.8 BIDDER shall establish a system for identification and traceability of product / deliverable throughout product realization.Product status with respect to inspection and testing requirements shall be identified.

5.9 BIDDER shall identify, verify, protect and safeguard EIL / Owner property (material / document) provided for use or incorporation into the product.If any Owner / EIL property is lost, damaged or otherwise found to be unsuitable for use, this shall be reported to the EIL / Owner.

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BIDDER shall ensure the conformity of product / deliverable during internal processing and delivery to the intended destination.Requirements mentioned in the MR/ tender shall be adhered to.

5.10 BIDDER shall establish system to ensure that inspection and testing activities are carried out in line with requirements.Where necessary, measuring equipment shall be calibrated at specified frequency, against national or international measurement standards; where no such standard exists, the basis used for calibration shall be recorded.The measuring equipment shall be protected from damage during handling, maintenance and storage.

5.11 BIDDER shall ensure effective monitoring, using suitable methods, of the processes involved in production and other related processes for delivery of the scope of contract.

5.12 BIDDER shall monitor and measure the characteristics of the product/deliverable to verify that product requirement has been met.The inspection (stage as well as final) by BIDDER and EIL / Owner personnel shall be carried out strictly as per the approved ITPs or ITPs forming part of the contract.Product release or service delivery shall not proceed until the planned arrangements have been satisfactorily completed, unless otherwise approved by relevant authority and where applicable by Owner / EIL.

5.13 BIDDER shall establish and maintain a documented procedure to ensure that the product which does not conform to requirements is identified and controlled to prevent its unintended use or delivery

5.14 All non-conformities (NCs) / deficiencies found by the BIDDER'S inspection / surveillance staff shall be duly recorded, including their disposal action shall be recorded and resolved suitably.Effective corrective actions shall be implemented by the BIDDER so that similar NCs including deficiencies do not recur.The BIDDER shall take appropriate actions to address the Risks and Opportunities in the project.

5.15 All deficiencies noticed and reported by EIL / Owner shall be analysed by the BIDDER and appropriate corrective actions shall be implemented.BIDDER shall intimate EIL / Owner of all such corrective action implemented by him.

5.16 BIDDER should follow the standards, specifications and approved drawings. Concessions/Deviations shall be allowed only in case of unavoidable circumstances. In such situations Concession/deviation request must be made by the BIDDER through online system of EIL vendor portal for document exchange. URL of EIL vendor portal for document exchange is http://edocx.eil.co.in/vportal. BIDDER shall have documented procedure for control of documents.

5.17 All project records shall be carefully kept, maintained and protected for any damage or loss until the project completion, then handed over to EIL / Owner as per contract requirement (Refer Specification Nos. 6-78-0002 - Specification for Documentation Requirements from Contractors and 6-78-0003 - Specification for Documentation Requirements from Suppliers), or disposed as per relevant project procedure.

6.0 AUDITS

BIDDER shall plan and carry out the QMS audit for the job. Quality audit program shall cover design, procurement, construction management and commissioning as applicable including activities carried out by sub-vendors and sub-contractors. This shall be additional to the certification body surveillance audits carried out under BIDDER'S own ISO 9001 certification scheme.

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The audit programs and audit reports shall be available with bidder for scrutiny by EIL / Owner.EIL or Owner's representative reserves the right to attend, as a witness, any audit conducted during the execution of the WORKS.

In addition to above, EIL, Owner and third party appointed by EIL/Owner may also perform Quality and Technical compliance audits.BIDDER shall provide assistance and access to their systems and sub-contractor / vendor systems as required for this purpose.Any deficiencies noted shall be immediately rectified by BIDDER.

7.0 DOCUMENTATION REQUIREMENTS

BIDDER shall submit following QMS documents immediately after award of work (Within one week) for record / review by EIL / Owner/ TPIA(Third Party Inspection Agency), as applicable:

- Organization chart (for complete organization structure and for the project)
- Project Quality Plan/Quality Assurance Plan
- Job specific Inspection Test Plans, if not attached with PR
- Job Procedures
- Inspection/Test Formats

In addition to above QMS documents, following documentation shall be maintained by the BIDDER for submission to EIL / Owner on demand at any point of time during execution of the project:

- Quality Manual
- Certificate of approval for compliance to ISO9001 standard
- Procedure for Control of Non-conforming Product
- Procedure for Control of Documents
- Sample audit report of the QMS internal and external audits conducted during last one year
- Customer satisfaction reports from at least 2 customers
- Project QMS audit report
- Technical audit reports for the project
- Corrective action report on the audits

Documents as specified above are minimum requirements. BIDDER shall submit any other document/data required for completion of the job as per EIL/Owner instructions.

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SPECIFICATION FOR DOCUMENTATION REQUIREMENTS FROM SUPPLIERS

Rev. No.	Date	Purpose	Prepared by	Checked by	Standards Committee Convener	Standards Bureau Chairman
					Approved by	
3	29-09-2025	General Revision	QMS Standards Committee	QMS Standards Committee	AK	MN
2	01-06-2020	General Revision	QMS Standards Committee	QMS Standards Committee	SKB	SKS
1	12-03-2015	General Revision	QMS Standards Committee	QMS Standards Committee	MPJ	SC
0	04-06-2009	Issued as Standard Specification	QMS Standards Committee	QMS Standards Committee	SCT	ND

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Abbreviations:

DCI	Document Control Index
EIL	Engineers India Limited
EPS	Electronic Procurement System
FOA	Fax of Acceptance
IC	Inspection Certificate
IRN	Inspection Release Note
ITP	Inspection and Test Plan
LOA	Letter of Acceptance
LR	Lorry Receipt
MR	Material Requisition
ODC	Over Dimension Consignment
PO	Purchase Order
PR	Purchase Requisition
PVC	Polyvinyl Chloride
QAP	Quality Assurance Plan
QMS	Quality Management System
RPO	Regional Procurement Office
TPIA	Third Party Inspection Agency
URL	Universal Resource Locator
V-Portal	Vendor Portal

QMS Standards Committee

Convener: Mr. Anil Kumar

Members:
Mr. Himangshu Pal (SCM-Inspection)
Mr. Ravindra Kumar (Const.)
Mr. Vinod Kumar (CQA)
Mr. Swapnil Vaishnav (Projects)
Mr.Vijay Kumar Garg (SCM)
Mr.Raju Kumar Pandey (Equipment Division)

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Annexures:

S. No.	Title	Doc. No.
1.	Format for completeness of Final Documentation	Format No. 3-78-0004

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1.0 SCOPE

This specification establishes the Documentation Requirements from Suppliers.

All documents/data against the PO / PR / MR shall be developed and submitted to EIL/Owner by the suppliers for review / records, in line with this specification.

2.0 DEFINITIONS

2.1 Supplier

For the purpose of this specification, the word "SUPPLIER" means the person(s), firm, company or organization who has entered into a contract with EIL / Owner for delivery of some products and/orservices.The word is considered synonymous to bidder, contractor or vendor.

2.2 Owner

Owner means the owner of the project for which services / products are being purchased and includes their representatives, successors and assignees.

3.0 REFERENCE DOCUMENTS

- Specification for Quality Management System Requirements from Bidders (Doc. No. 6-78-0001)

4.0 DOCUMENTATION REQUIREMENTS

4.1 Order Acknowledgement and Assigning Project Manager

After placement of order, Supplier shall acknowledge order through V-Portal within 7 days of receipt of FOA/PO. Supplier shall assign a Project Manager for that order though online portal and provide requisite details. Project Manager details shall include e-mail address, mailing address, mobile/telephone nos., fax nos. and name of Project Manager. All the system generated emails pertaining to that order shall be sent to the assigned Project Manager.

4.2 Documents/Data to be submitted by the Supplier

4.2.1 The Supplier shall submit the documents and data against the PO/PR/MR as per the list given in respectivePO/PR/MR.

4.2.2 Review of the supplier drawings/ documents by EIL would be only to review the compatibility with basic designs and concepts and in no way absolve the supplier of his responsibility/contractual obligation to comply with PR requirements, applicable codes, specifications and statutory rules/regulations.Any error/deficiency noticed during any stage of manufacturing/execution/inspection/ installation shall be promptly corrected by the supplier without any time and cost implications, irrespective ofcomments on the same were received from EIL during the drawing review stage or not.

4.2.3 Unless otherwise specified, submission of documents for Review/Records shall commence as follows from the date of Fax of Intent /Letter of Intent/ Fax of Acceptance (FOA)/ Letter of Acceptance (LOA):

QMS	-	1week
Document Control Index	-	2weeks
Other Documents/Drawings	-	As per approved Document Control Index

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4.2.4 Documents as specified in PO/PR/MR are minimum requirements.Supplier shall submit any other document/data required for completion of the job as per EIL/Owner instructions.

4.3 Style and Formatting

4.3.1 All Documents shall be in ENGLISH language and in M.K.S(Meter-Kilogram-Second) System of units.

4.3.2 Before forwarding the drawings and documents, contractor shallobtain the title block from EIL and ensure that the following information are properly mentioned in each drawing:

- Purchase Requisition Number
- Name of Equipment / Package
- Equipment / Package Tag No.
- Name of Project
- Client
- Drawing / Document Title
- Drawing / Document No.
- Drawing / Document Revision No. and Date

4.4 Review and Approval of Documents by Supplier

4.4.1 All, the Drawing/Documents shall be reviewed, checked, approved and duly signed/stamped by supplier before submission.Revision number shall be changed during submission of the revised supplier documents and all revisions shall be highlighted by clouds. Whenever the supplierrequires any sub-supplier drawings to be reviewed by EIL, the same shall be submitted by the supplier duly reviewed, approved and stamped by the supplier.Direct submission of sub-supplier's drawings without contractor's / suppliers' approval shall not be entertained.

4.5 Document Category

Following review codes shall be used for review of supplier Drawings/Documents:

Code 1 - No comments. Proceed with Manufacture / Fabrication / Construction as per the document.

Code 2 - Proceed with Manufacture / Fabrication / Construction as per commented document. Revised document required.

Code 3 - Document does not conform to basic requirements as marked.Resubmitfor review.

Code R - Document is retained for Records. Proceed with Manufacturing / fabrication as per Tender/ ContractRequirement.

Code V - Void, Document is returned as invalid.

Document is marked as Void under following conditions:

a) Wrong item drawing uploaded.
b) Superseded or obsolete submission.
c) Duplicate submission.
d) Out of sequence submission.
e) Mismatch in document name and title under which document uploaded.
f) Document not legible.
g) For PMC projects, document not signed and stamped by contractor and DEC

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4.6 Methodology for Submission of Documents to EIL/Owner

4.6.1 Document Control Index (DCI)

Supplier shall create and submit Document Control Index (DCI) forreview based on PO/PR/MR along with schedule date of submission of each drawing/document on EIL Vendor Portal.The DCI shall be specific with regard to drawing/document no. and the exact title. Proper sequencing of the drawings/documents should be ensured in schedule date of submission.

4.6.2 Submission of Drawings/Documents / Data

Drawings/documents, data and DCI shall be uploaded on the EIL Vendor Portal as per approved DCI. The detailed guidelines for uploading documents on EIL VendorPortal are available on URL:**http://edocx.eil.co.in/vportal**

4.6.3 Statutory Approvals

Wherever approval by any statutory body is required to be taken by Supplier, the Supplier shall submit copy of approval by the authority to EIL.

4.6.4 Manufacturing Schedule

Supplier shall prepare milestone based(milestones such as document submission, sub ordering, manufacturing, Inspection, dispatches, etc.) manufacturing schedule for the order, to meet delivery as per FOA/PO terms. Supplier shall submit manufacturing schedule to concerned Regional Procurement Office (RPO) of EIL, with a copy to Head office monitoring team/Owner for review within 7 days from date of FOA/PO.Same shall be uploaded in the EPS portal of EILi.e.,https://www6.eil.co.in/epsinspection/supp

4.6.5 Schedule and Progress Reporting

Supplier shall submit Monthly Progress Report(MPR) on or before the 9th of every monthindicating following milestone-based progress details as minimum:

- Drawing submission and approval status and schedule for submission of revised drawing / fresh Drawing requiring approval as per approved DCI
- Sub-ordering plan/details for all major items indicating item description, sub-order number, Date of sub-ordering, sub-vendor name, Location, contractual delivery data and expected delivery dates at main vendor's shop and other critical details requiring timely receipt of sub-ordered items at shop.
- Shop manufacturing progress indicating major milestone progress, in case of missing any milestone date, catch up plan for the same and expected dispatch date from shop and expected delivery date at site.
- Area requiring special attention/concern and proposed action plan to resolve the same.

First Monthly Progress Report (MPR) shall be submitted within2 weeks from FOA/LOA.In case of exigencies, EIL/Owner can ask for report submission as required on weekly/fortnightly/ad-hoc basis depending upon supply status and supplier shall furnish such reports promptly without any price implication.Format for progress report shall be submitted by the Supplier during kick off meeting or within 2 weeks of receiving FOA/LOA, whichever is earlier.

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4.7 Inspection and Testing

4.7.1 Quality Assurance Plan/Inspection and Test Plan

If Inspection and test plans (ITP)are attached with MR/PR same shall be followed along with additional tests requirement (if any) mentioned in MR/ PR. However for cases wherein EIL Standard ITPs not available/ have not been attached with MR/PR, Supplier shall submit within one week of receiving FOA/LOA, the Quality Assurance Plan for inspection & testing at various stages of production, quality control records for critical bought out items/ materials and site assembly & testing as may be applicable to the specific order and obtain approval from concerned Regional procurement Office of EIL/third party inspection agency, as applicable.

For Package equipment contracts, the supplier shall prepare a list of items/ equipment and their inspection categorization plan for all items included in the scope of supply immediately after receipt of order and obtains approval for the same from EIL. The items shall be categorized into different categories depending upon their criticality for the scope of inspection of TPIA and/or EIL.

4.7.2 Inspection Requirements:

Supplier shall perform internal inspection as per ITP/ approved QAP at their works based on approved documents/drawings. Upon satisfactory internal inspection, supplier shall raise inspection call through Inspection call Module of EPS (https://www6.eil.co.in/epsinspection) to concerned Regional Procurement Office (RPO) of EIL/ TPIA/ Owner with advance notice as per contractalong with Internal test reports. Where inspection is not in the scope of EIL and is carried out by nominated Third Party Inspection agency (TPIA), Inspection Release Note (IRN) issued by the nominated TPIA along with Manufacturer's Test Certificate (MTC) shall be uploaded in EIL EPS Portal (https://www6.eil.co.in/epsinspection).

All changes w.r.t. PR shall be recorded through agreed variations or Concessions & Deviations. Conflict, if any, between PR / Job specifications and approved drawings, shall be brought to the notice of EIL / owner bythe supplier/ contractor. Decision of EIL / owner will be binding on the supplier and to be complied without time and cost implications.

Identified bought out items/ raw material shall be procured under TPIA as per ITP.

4.7.3 Inspection Release Note (IRN)/ Inspection Certificate (IC)

IRN/ IC shall be issued by EIL Inspector/ third party inspection agency on successful inspection, review of test reports/ certificates as per specifications &ITP/ agreed quality plan (as applicable) and only after all the drawings/documents as per DCI are submitted and are accepted under review code-1or code R. Supplier shall ensure that necessary documents/manufacturing and test certificates are made available to EIL/TPIA as and when desired.

Note 1: Non fulfilling above requirement shall result into appropriate penalty or with- holding of payment as per conditions of PO/PR/MR.

Note 2: For items where IRN/IC is issued by TPIA, supplier to ensure that following as a minimum must be mentioned by TPIA in IRN/IC:

a) PR document number
b) List of drawings/documents with EIL approval code
c) Tests witnessed, documents reviewed

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d) Compliance statement by TPIA that product meets the requirement as specified in EIL PR, standard specifications, Inspection Test Plan/QAP and approved documents.

4.8 Transportation Plan

Transportation Plan for Over Dimensional Consignments (ODC), if any, shall be submitted within 2 weeks of receiving FOA/LOA, for approval. Unless otherwise specified, consignments with parameters greater than following shall be considered as over dimensional.

Dimensions : 4 meters width x 4 meters height x 20 meters length

Weight : 32 MT (Metric Ton)

Dimensions and weight provided above are inclusive of all nozzles, attachments, transportation saddles etc.

Physical Rout survey for ODC movement shall be submitted to EIL within 8 weeks of receiving FOA / LOA.

4.9 Dispatch Details

Upon receipt of IRN/IC from EIL inspector/TPIA, supplier shall dispatch items within 2 days. Item wise dispatch details shall be uploaded in EIL's EPS module within 24 hours of any item dispatched from shop, indicating PR item no, Quantity dispatched, Transporter's name, LR Number/ LR date.

4.10 Vendorshall ensure timely uploading of Manufacturing Schedule, Monthly Progress Report,Inspection Certificate (IRN)issued by the TPIA (as applicable for PO where Inspection is under nominated Third Party Inspection Agency)and updation ofitem wise dispatch details in EPS portal of EIL (https://www6.eil.co.in/epsinspection).

4.11 Final Documentation

4.11.1 Supplier shall prepare final documents in line with VDR(Vendor Document Requirements) attached with PR/Tender. A copy of final document along with filled in Format for Completeness of Final Documentation (Format No. 3-78-0004) to be submitted to EIL Inspector/TPIA for review & approval within 2 weeks from dispatch. Upon receipt of EIL/TPIA endorsement on Completeness of Final Documents, supplier shall submit soft/hard copies of Final documents to EIL/Owner in requisite quantity as per PO/PR details, along with covering letter. A copy of covering letter to be submitted to the concerned Regional Procurement Office (RPO) of EIL/Owner.

4.11.2 As Built Drawings

Minor Shop changes made by Supplier after approval of drawings under 'Code 1' by EIL and deviations granted through online system, if any, shall be marked in hard copies of drawings which shall then be stamped 'As-built' by the supplier.These 'As-built' drawings shall be reviewed and stamped by EIL Inspector/TPIA.Supplier shall prepare scanned images files of all marked – up 'As – built' drawings. Simultaneously Supplier shall incorporate the shop changes in the native soft files of the drawings also.

4.11.3 Packing/Presentation of Final Documents

Final Documents shall be legible photocopies in A4, A3 size only.Drawings will be inserted in plastic pockets (both sides transparent, sheet thickness minimum 0.1 mm) with an extra strip of 12 mm wide for punching so that drawings are well placed.

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Final Documentation shall be bound in Hard board Plastic folder(s) of size 265 mm x 315 mm (10½-inch x 12½-inch) and shall not be more that 75 mm thick. It may be of several volumes and each volume shall have a volume number, index of volumes and index of contents of that particular volume.Where number of volumes are more, 90mm thickness can be used.Each volume shall have top PVC sheet of minimum 0.15 mm thick duly fixed and pressed on folder cover and will have 2 lever clips.In case of imported items documents, 4 lever clip shall also be accepted.All four corners of folders shall be properly metal clamped.Indexing of contents with page numbering must be incorporated by supplier.Spiral/Spico bound documents shall not be acceptable.As mentioned above, books should be in hard board plastic folders with sheets punched and having 2/4 lever clips arrangement.

Each volume shall contain on cover a Title Block indicating package Equipment Tag No. & Name, PO/Purchase Requisition No., Name of Project and Name of Customer.Each volume will have hard front cover and a reinforced spine to fit thickness of book.These spines will also have the title printed on them.Title shall include also volume number (say 11 of 15) etc.

4.11.4 Submission of Soft Copies

Supplier shall submit to EIL, the scanned images files as well as the native files of drawings/documents, along with proper index.

In addition to hard copies, Supplier shall submit soft copies of all the final drawings and documents in pen drive or any other specified medium with proper identification tag, all text documents prepared on computer, scanned images of all important documents (not available as soft files), all relevant catalogues, manuals available as soft files (editable copies of drawings/text documents, while for catalogues/manuals/proprietary information and data, PDF files can be furnished). All soft files shall be appropriately named, systematically indexed, and duly bookmarked in PDF format to facilitate ease of reference and access.

All the above documents shall also be uploaded on the EILVendor Portal and if applicable on Client Server also.

4.11.5 Completeness of Final Documentation

Supplier shall get the completeness of final documentation verified by EIL/TPIA,as applicable, and attach the Format for Completeness of Final Documentation (Format No. 3-78-0004) duly signed by EIL Inspector or TPIA as applicable to the final document folder.

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COMPLETENESS OF FINAL DOCUMENTATION

Name of Supplier/Contractor	:	
Customer	:	
Project	:	
EIL's Job No.	:	
Purchase Order No./ Contract No.	:	
Purchase Requisition No./ Tender No.	:	Rev. No.:
Name of the Work/ Equipment	:	
Tag. No.	:	
Supplier's/ Contractor's Works Order No.	:	

Certified that the Engineering Documents/ Manufacturing & Test Certificates submitted by the supplier (as per Index sheet mentioned in Annexure-1) are complete in accordance with the Vendor Data Requirements of Purchase Requisition / Tender.

Signature	: ……	Signature	: ……
Date	: ……	Date	: ……
Name	: ……..	Name	: ……..
Designation	: ……	Designation	: ……
Department	: ……	Department	: ……
	Supplier/Contractor		EIL/TPIA

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Annexure-1

Final Documentation Index Sheet			
PR/PO/Tender No.		Revision No.	
Serial No.	Document Title	Page/ Folder No.	No. of Pages

Signature	: ……	Signature	: ……
Date	: ……	Date	: ……
Name	: ……..	Name	: ……..
Designation	: ……	Designation	: ……
Department	: ……	Department	: ……

Supplier / Contractor

EIL / TPIA

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ADDITIONAL TECHNICAL REQUIREMENTS FOR VALVES-GATE/GLOBE/CHECK

Rev. No	Date	Purpose	Prepared by	Checked by	Approved by
A	12.01.26	ISSUED FOR BIDS	AV	AV	LSJ

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Page 449 of 475 : B440-003-WB-MR-3517-158-RFO : Rev. A

Page 450 of 475 : B440-003-WB-MR-3547-158-RFQ : Rev. A

ADDITIONAL TECHNICAL REQUIREMENTS

1. Bidder to note that no correspondence shall be entered into or entertained after the bid submission.

2. Bidder shall furnish quotations only for those items, for which he can supply strictly as per MR specifications and for which he is approved by EIL/Owner.

3. No technical details of any nature shall be included in the offer. If the offer contains any technical deviation or clarification or stipulates any technical specifications (even if in line with the MR requirements), the offer is liable for rejection.

4. The submission of price by Bidder shall be construed to mean that he has confirmed compliance with all technical specifications of the corresponding item(s).

5. Bidders shall ensure compliance to the following specifications attached with the requisition:
   a) Technical Notes for Valves, 6-44-0052.
   b) Specification for Positive Material Identification (PMI) at Supplier's Works, 6-81-0001.
   c) Inspection and Test Plan For Valves, 6-81-0004.
   d) Specification for Quality Management System Requirements from Bidders, 6-78-0001.
   e) Specification for Documentation Reqts. from Suppliers,6-78-0003.
   f) Additional Technical Requirements, B440-003-16-43-ATR-3517.
   g) Valve Material Specifications, B440-003-6-44-0006-3517.
   h) Material requirement for carbon steel components used in sour service in petroleum refinery environments, 6-79-0013

6. MR quantity can be increased or decreased upto 25 (twenty five) percent for ordering, if so warranted. Percentage figure in decimal will be rounded off to next higher number.

7. Wherever valves are specified as "LOCK OPEN" or "LOCK CLOSED", valves shall be supplied accordingly and Lock shall be in vendor's scope.

8. In case of any conflict amongst documents attached with the MR, the most stringent shall govern and Owner's / EIL decision shall be final in this regard.

9. Concession/Deviation Permit as mentioned in Cl. 5.17 of Specification for Quality Management System Requirements from Bidders (6-78-0001) is not applicable.

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Client :	NRL	**Dept. / Sect :**	16/43
Project :	DCU Revamp, NRLP		
Location :	NUMALIGARH , ASSAM	**Tag No : 51301**	**Sheet No.** 1 of 1

GATE VALVE SPECIFICATION | **MANUF'S OFFER**

TAG NO. : 51301 **RATING :** 150 **STANDARD :** API 600/ ISO 10434

SIZE RANGE : 2.00 " TO 42.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : A1A,A32A,A9A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
BONNET	BOLTED	ASTM A 216 GR.WCB		
STEM	RISING	13% CR.STEEL (NO CASTING)		
WEDGE DISC	SOLID/FLEXIBLE	13% CR STEEL FACING/13% CR. STEEL		
BODY SEAT RING	RENEWABLE/NON RENEWABLE	STELLITED		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	NON RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR B7		
BONNET NUTS		ASTM A194 GR 2H		
BONNET GASKET		SP WND SS316-GRAFOIL FILLER/CORRUGATED SS 316		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
SPECIAL SERVICE CONDITIONS		MAX TEMP 371 DEG.C.		
BACK SEAT & SHOULDER		13% CR STEEL		
OTHERS	O.S & Y.			
HYDROSTATIC TEST PRESSURE	BODY : 450 PSIG	SEAT : 325 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.

2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".

3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.

4 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH ANSI B-16.34 WITH TESTING AS PER API 598 AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.

5 5% VALVE CASTINGS UPTO 24" AND 100% VALVE CASTINGS 26" AND ABOVE SHALL UNDERGO RADIOGRAPHIC EXAMINATION.

6 FOR VALVE SIZE UPTO 24", VALVES AS PER API-600 AND TESTING AS PER API-598 ARE ALSO ACCEPTABLE.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6	7
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018	9-Dec-2019

51301

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Client :	NRL	**Dept. / Sect :**	16/43
Project :	DCU Revamp, NRLP		
Location :	NUMALIGARH , ASSAM	**Tag No : 51302**	**Sheet No.** 1 of 2

GATE VALVE SPECIFICATION | **MANUF'S OFFER**

TAG NO. : 51302 **RATING :** 150 **STANDARD :** API 600/ ISO 10434

SIZE RANGE : 2.00 " TO 36.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : A2A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
BONNET	BOLTED	ASTM A 216 GR.WCB		
STEM	RISING	13% CR.STEEL (NO CASTING)		
WEDGE DISC	SOLID/FLEXIBLE	13% CR STEEL FACING/13% CR. STEEL		
BODY SEAT RING	RENEWABLE/NON RENEWABLE	STELLITED		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	NON RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR B7		
BONNET NUTS		ASTM A194 GR 2H		
BONNET GASKET		SP WND SS316-GRAFOIL FILLER/CORRUGATED SS 316		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
SPECIAL SERVICE CONDITIONS	I.B.R	STEAM/CONDENSATE/BOILER FEED WATER; MAX. TEMP. 371 DEG.C.		
BACK SEAT & SHOULDER		13% CR STEEL		
OTHERS	O.S & Y.			
HYDROSTATIC TEST PRESSURE	BODY : 450 PSIG	SEAT : 325 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.
2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".
3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.
4 TESTING SHALL BE AS PER IBR ALSO.
5 ALL VALVES SHALL BE SUPPLIED WITH IBR CERTIFICATE IN FORM-III C.
6 ALL VALVES SHALL BE PAINTED RED ON BODY-BONNET JOINT.
7 5% VALVE CASTINGS UPTO 24" AND 100% VALVE CASTINGS 26" AND ABOVE SHALL UNDERGO RADIOGRAPHIC EXAMINATION.
8 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH ANSI B-16.34 WITH TESTING AS PER API-598 RESPECTIVELY & IBR AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6	7
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018	9-Dec-2019

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9 VALVES TO COMPLY WITH DESIGN REQUIREMENTS OF IBR ALSO.

10 FOR VALVE SIZE UPTO 24", VALVES AS PER API-600 AND TESTING AS PER API-598 & IBR ARE ALSO ACCEPTABLE.

SHEET REV NO.	2	3	4	5	6	7
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018	9-Dec-2019

51302

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Client : NRL | **Dept. / Sect :** 16/43

Project : DCU Revamp, NRLP

Location : NUMALIGARH , ASSAM | **Tag No : 51311** | **Sheet No.** 1 of 1

GATE VALVE SPECIFICATION

MANUF'S OFFER

TAG NO. : 51311 **RATING :** 150 **STANDARD :** API 600/ ISO 10434

SIZE RANGE : 2.00 " TO 30.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : A61A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
BONNET	BOLTED	ASTM A 216 GR.WCB		
STEM	RISING	SS 316L (NO CASTING)		
WEDGE DISC	FLEXIBLE	FACED WITH SS 316L/SS 316L		
BODY SEAT RING	RENEWABLE/NON-REN EWABLE	FACED WITH SS 316L/SS 316L		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	NON RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR B7M		
BONNET NUTS		ASTM A194 GR 2HM		
BONNET GASKET		SP WND SS316L-GRAFOIL FILLER/CORRUGATED SS316L		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
SPECIAL SERVICE CONDITIONS	NACE	SOUR SERVICE/MAX TEMP 371 DEG.C.		
BACK SEAT & SHOULDER		SS 316L		
OTHERS	O.S & Y.			
HYDROSTATIC TEST PRESSURE	BODY : 450 PSIG	SEAT : 325 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.

2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".

3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.

4 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH ANSI B-16.34 WITH TESTING AS PER API-598 AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.

5 50% VALVE CASTINGS UPTO 24" AND 100% VALVE CASTINGS 26" AND ABOVE SHALL UNDERGO RADIOGRAPHIC EXAMINATION.

6 FOR VALVE SIZE UPTO 24", VALVES AS PER API-600 AND TESTING AS PER API-598 ARE ALSO ACCEPTABLE.

7 NACE REQUIREMENTS SHALL BE AS PER MR0103.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6	7	8
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	1-Dec-2004	9-Dec-2005	30-Jun-2009	26-Apr-2018

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Client :	NRL	**Dept. / Sect :**	16/43
Project :	DCU Revamp, NRLP		
Location :	NUMALIGARH , ASSAM	**Tag No : 51313**	**Sheet No.** 1 of 1

GATE VALVE SPECIFICATION | **MANUF'S OFFER**

TAG NO. : 51313 **RATING :** 150 **STANDARD :** API 600/ ISO 10434

SIZE RANGE : 2.00 " TO 24.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : A19A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
BONNET	BOLTED	ASTM A 216 GR.WCB		
STEM	RISING	SS 316; (NO CASTING)		
WEDGE DISC	SOLID/FLEXIBLE	SS 316		
BODY SEAT RING	RENEWABLE/NON-REN EWABLE	SS 316		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	NON RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR.B7		
BONNET NUTS		ASTM A194 GR.2H		
BONNET GASKET		SP WND SS316-GRAFOIL FILLER/CORRUGATED SS316		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
SPECIAL SERVICE CONDITIONS		CAUSTIC SERVICE (MAX.TEMP.110 DEG.C) & AMINE		
BACK SEAT & SHOULDER		SS 316		
OTHERS	O.S & Y.			
HYDROSTATIC TEST PRESSURE	BODY : 450 PSIG	SEAT : 325 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.
2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".
3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.
4 50% VALVE CASTINGS SHALL UNDERGO RADIOGRAPHIC EXAMINATION.
5 VALVES AS PER API-600 AND TESTING AS PER API-598 ARE ALSO ACCEPTABLE.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6	7
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018	9-Dec-2019

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Client :	NRL	**Dept. / Sect :**	16/43
Project :	DCU Revamp, NRLP		
Location :	NUMALIGARH , ASSAM	**Tag No : 51321**	**Sheet No.** 1 of 1

GATE VALVE SPECIFICATION

MANUF'S OFFER

TAG NO. : 51321 **RATING :** 150 **STANDARD :** API 600/ ISO 10434

SIZE RANGE : 2.00 " TO 24.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : A33A,A3A,A94A,A96A,A97A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
BONNET	BOLTED	ASTM A 216 GR.WCB		
STEM	RISING	13% CR.STEEL (NO CASTING)		
WEDGE DISC	SOLID/FLEXIBLE	13% CR STEEL FACING/13% CR. STEEL		
BODY SEAT RING	RENEWABLE/NON RENEWABLE	STELLITED		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	NON RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR B7		
BONNET NUTS		ASTM A194 GR 2H		
BONNET GASKET		SP WND SS316-GRAFOIL FILLER/CORRUGATED SS 316		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
SPECIAL SERVICE CONDITIONS				
BACK SEAT & SHOULDER		13% CR STEEL		
OTHERS	O.S & Y.			
HYDROSTATIC TEST PRESSURE	BODY : 450 PSIG	SEAT : 325 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.

2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".

3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.

4 RADIOGRAPHY OF VALVE CASTINGS NOT REQUIRED.

5 VALVES AS PER API-600 AND TESTING AS PER API-598 ARE ALSO ACCEPTABLE.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	3	4	5	6	7
DATE	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018	9-Dec-2019

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Client : NRL | **Dept. / Sect :** 16/43

Project : DCU Revamp, NRLP

Location : NUMALIGARH , ASSAM | **Tag No : 51380** | **Sheet No.** 1 of 1

GATE VALVE SPECIFICATION

MANUF'S OFFER

TAG NO. : 51380 **RATING :** PN1.6 **STANDARD :** IS:14846

SIZE RANGE : 2.00 " TO 6.00 " **ENDS :** FLGD TO B-16.1 FF/125AARH

PIPING CLASS : J2A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	IS 210 GR.FG 200		
BONNET	BOLTED	IS 210 GR.FG 200		
STEM	NON RISING	HIGH TENSILE BRASS IS:320 GR HT2/ IS-6912 GR. FHTB2		
WEDGE DISC	SOLID/FLEXIBLE	IS 210 GR. FG 200		
BODY SEAT RING	RENEWABLE/NON RENEWABLE	LEADED TIN BRONZE IS:318 GR.LTB2		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	PTFE/ RUBBER IS: 638 TYPE B		
HAND WHEEL	NON RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		IS 1363 PT-1 CL. 4.6		
BONNET NUTS		IS 1363 PT-3 CL. 4.0		
BONNET GASKET		BUTYL RUBBER		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
SPECIAL SERVICE CONDITIONS		POTABLE WATER		
BACK SEAT & SHOULDER		IS:320 GR HT2		
OTHERS				
WEDGE FACING RINGS & NUT		LEADED TIN BRONZE IS 318 GR. LTB2/ IS: 320 GR. HT2		
HYDROSTATIC TEST PRESSURE	BODY : 348 PSIG	SEAT : 232 PSIG		
TEST PRESSURE WITH AIR				

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.
2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".
3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.
4 TESTING SHALL BE AS PER IS:14846
5 FLANGE END SHALL BE FLAT FACE DRILLED TO ANSI B16.1, 125 # .
6 RADIOGRAPHY OF VALVE CASTINGS NOT REQUIRED.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6	7
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	16-Apr-2002	30-Jun-2009	26-Apr-2018

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Client :	NRL	**Dept. / Sect :**	16/43
Project :	DCU Revamp, NRLP		
Location :	NUMALIGARH , ASSAM	**Tag No : 513AF**	**Sheet No.** 1 of 1

GATE VALVE SPECIFICATION

MANUF'S OFFER

TAG NO. : 513AF **RATING :** 150 **STANDARD :** API 600/ ISO 10434

SIZE RANGE : 2.00 " TO 24.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : A41D

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 217 GR.WC6 (NORM. & TEMP.)		
BONNET	BOLTED	ASTM A 217 GR.WC6 (NORM. & TEMP.)		
STEM	RISING	13% CR.STEEL (NO CASTING)		
WEDGE DISC	FLEXIBLE	STELLITED		
BODY SEAT RING	NON-RENEWABLE/REN EWABLE	STELLITED		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	NON RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR B16		
BONNET NUTS		ASTM A194 GR.4/GR7		
BONNET GASKET		SP WND SS316-GRAFOIL FILLER		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
SPECIAL SERVICE CONDITIONS		MAX TEMP 400 DEG. C.		
BACK SEAT & SHOULDER		13 % CR STEEL		
OTHERS	O.S & Y.			
HYDROSTATIC TEST PRESSURE	BODY : 450 PSIG	SEAT : 325 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.

2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".

3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.

4 10% VALVE CASTINGS UPTO 24" AND 100% VALVE CASTINGS 26" AND ABOVE SHALL UNDERGO RADIOGRAPHIC EXAMINATION.

5 VALVES AS PER API-600 AND TESTING AS PER API-598 ARE ALSO ACCEPTABLE.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	0
DATE	10-Oct-2022

513AF

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Client :	NRL	**Dept. / Sect :**	16/43
Project :	DCU Revamp, NRLP		
Location :	NUMALIGARH , ASSAM	**Tag No : 513HA**	**Sheet No.** 1 of 2

GATE VALVE SPECIFICATION | **MANUF'S OFFER**

TAG NO. : 513HA **RATING :** 150 **STANDARD :** API 600/ ISO 10434

SIZE RANGE : 2.00 " TO 24.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : A28A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
BONNET	BOLTED	ASTM A 216 GR.WCB		
STEM	RISING	SS 316L (NO CASTING)		
WEDGE DISC	FLEXIBLE	FACED WITH SS 316L/SS 316L		
BODY SEAT RING	RENEWABLE/NON-REN EWABLE	FACED WITH SS 316L/SS 316L		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	NON RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR B7M		
BONNET NUTS		ASTM A194 GR 2HM		
BONNET GASKET		SP WND SS316L-GRAFOIL FILLER/CORRUGATED SS316L		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
SPECIAL SERVICE CONDITIONS	NACE + HIC	SOUR SERVICE/MAX TEMP 371 DEG.C.		
BACK SEAT & SHOULDER		SS 316L		
OTHERS	O.S & Y.			
HYDROSTATIC TEST PRESSURE	BODY : 450 PSIG	SEAT : 325 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.
2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".
3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.
4 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH ANSI B-16.34 WITH TESTING AS PER API-598 AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.
5 50% VALVE CASTINGS UPTO 24" AND 100% VALVE CASTINGS 26" AND ABOVE SHALL UNDERGO RADIOGRAPHIC EXAMINATION.
6 FOR VALVE SIZE UPTO 24", VALVES AS PER API-600 AND TESTING AS PER API-598 ARE ALSO ACCEPTABLE.
7 NACE REQUIREMENTS SHALL BE AS PER MR0103.
8 VENDOR SHALL CERTIFY SUITABILITY OF THE VALVE FOR INTENDED SERVICE CONDITION.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	0
DATE	16-Aug-2023

513HA

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9 HIC(HYDROGEN INDUCED CRACKING) RESISTANCE REQUIREMENT AS PER EIL SPECIFICATION 6-79-0013 SHALL BE APPLICABLE.

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Client :	NRL	**Dept. / Sect :**	16/43
Project :	DCU Revamp, NRLP		
Location :	NUMALIGARH , ASSAM	**Tag No : 51401**	**Sheet No.** 1 of 1

GATE VALVE SPECIFICATION | **MANUF'S OFFER**

TAG NO. : 51401 **RATING :** 300 **STANDARD :** API 600/ ISO 10434

SIZE RANGE : 2.00 " TO 24.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : B1A,B9A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
BONNET	BOLTED	ASTM A 216 GR.WCB		
STEM	RISING	13% CR.STEEL (NO CASTING)		
WEDGE DISC	FLEXIBLE/SOLID	13% CR STEEL FACING/13% CR. STEEL		
BODY SEAT RING	RENEWABLE/NON RENEWABLE	STELLITED		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	NON RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR B7		
BONNET NUTS		ASTM A194 GR 2H		
BONNET GASKET		SP WND SS316-GRAFOIL FILLER		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
SPECIAL SERVICE CONDITIONS		MAX TEMP 427 DEG.C.		
BACK SEAT & SHOULDER		13% CR STEEL		
OTHERS	O.S & Y.			
HYDROSTATIC TEST PRESSURE	BODY : 1125 PSIG	SEAT : 825 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.

2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".

3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.

4 10% VALVE CASTINGS UPTO 16" AND 100% VALVE CASTINGS 18" AND ABOVE SHALL UNDERGO RADIOGRAPHIC EXAMINATION.

5 VALVES AS PER API-600 AND TESTING AS PER API-598 ARE ALSO ACCEPTABLE.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6	7
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018	9-Dec-2019

51401

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Client :	NRL	**Dept. / Sect :**	16/43
Project :	DCU Revamp, NRLP		
Location :	NUMALIGARH , ASSAM	**Tag No : 51466**	**Sheet No.** 1 of 1

GATE VALVE SPECIFICATION

TAG NO. : 51466 **RATING :** 300 **STANDARD :** API 600/ ISO 10434

SIZE RANGE : 2.00 " TO 24.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : B1N

MANUF'S OFFER

STANDARD :

MFGRS CAT/FIG :
(For category -II MRs only)

RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 351 GR CF3M		
BONNET	BOLTED	ASTM A 351 GR.CF3M		
STEM	RISING	SS 316L (NO CASTING)		
WEDGE DISC	FLEXIBLE	SS 316L		
BODY SEAT RING	RENEWABLE/NON-REN EWABLE	SS 316L		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	NON RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR B7		
BONNET NUTS		ASTM A194 GR 2H		
BONNET GASKET		SP WND SS316L-GRAFOIL FILLER		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
SPECIAL SERVICE CONDITIONS		MAX TEMP 454 DEG.C.		
BACK SEAT & SHOULDER		SS316L		
OTHERS	O.S & Y.			
HYDROSTATIC TEST PRESSURE	BODY : 1100 PSIG	SEAT : 800 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.

2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".

3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.

4 10% VALVE CASTINGS UPTO 16" AND 100% VALVE CASTINGS 18" AND ABOVE SHALL UNDERGO RADIOGRAPHIC EXAMINATION.

5 ALL CASTINGS SHALL BE SOLUTION HEAT TREATED.

6 WELD REPAIRS, IF ANY, SHALL BE CARRIED OUT BEFORE SOLUTION HEAT TREATMENT.

7 VALVES AS PER API-600 AND TESTING AS PER API-598 ARE ALSO ACCEPTABLE.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018

51466

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Client :	NRL	**Dept. / Sect :**	16/43
Project :	DCU Revamp, NRLP		
Location :	NUMALIGARH , ASSAM	**Tag No : 52301**	**Sheet No.** 1 of 1

GLOBE VALVE SPECIFICATION

MANUF'S OFFER

TAG NO. : 52301 **RATING :** 150 **STANDARD :** BS-1873

SIZE RANGE : 2.00 " TO 16.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : A1A,A9A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
BONNET	BOLTED	ASTM A 216 GR.WCB		
STEM	RISING	13% CR.STEEL (NO CASTING)		
DISC	LOOSE PLUG TYPE/BALL TYP	13% CR STEEL FACING/13% CR STEEL		
BODY SEAT RING	RENEWABLE/NON RENEWABLE	STELLITED		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR B7		
BONNET NUTS		ASTM A194 GR 2H		
BONNET GASKET		SP WND SS316-GRAFOIL FILLER/ CORRUGATED SS316		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
OTHERS	O S & Y			
SPECIAL SERVICE CONDITION		MAX TEMP 371 DEG. C.		
BACK SEAT & SHOULDER		13% CR STEEL		
HYDROSTATIC TEST PRESSURE	BODY : 450 PSIG	SEAT : 325 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.
2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".
3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.
4 TESTING SHALL BE AS PER BS EN 12266-1.
5 5% VALVE CASTINGS SHALL UNDERGO RADIOGRAPHIC EXAMINATION

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6	7
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018	9-Dec-2019

52301

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Client : NRL | **Dept. / Sect :** 16/43

Project : DCU Revamp, NRLP

Location : NUMALIGARH , ASSAM | **Tag No : 52313** | **Sheet No.** 1 of 1

GLOBE VALVE SPECIFICATION

MANUF'S OFFER

TAG NO. : 52313 **RATING :** 150 **STANDARD :** BS-1873

SIZE RANGE : 2.00 " TO 16.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : A19A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
BONNET	BOLTED	ASTM A 216 GR.WCB		
STEM	RISING	SS 316; (NO CASTING)		
DISC	LOOSE PLUG TYPE/BALL TYP	SS 316		
BODY SEAT RING	RENEWABLE/NON RENEWABLE	SS 316		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR B7		
BONNET NUTS		ASTM A194 GR 2H		
BONNET GASKET		SP WND SS316-GRAFOIL FILLER/CORRUGATED SS316		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
OTHERS	O S & Y			
SPECIAL SERVICE CONDITION		CAUSTIC SERVICE(MAX.TEMP.110 DEG.C) & AMINE;		
BACK SEAT & SHOULDER		SS 316		
HYDROSTATIC TEST PRESSURE	BODY : 450 PSIG	SEAT : 325 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.
2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".
3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.
4 TESTING SHALL BE AS PER BS EN 12266-1.
5 50% OF VALVE CASTING SHALL UNDERGO RADIOGRAPHIC EXAMINATION.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6	7
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018	9-Dec-2019

52313

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Client : NRL | **Dept. / Sect :** 16/43

Project : DCU Revamp, NRLP

Location : NUMALIGARH , ASSAM | **Tag No : 52401** | **Sheet No.** 1 of 1

GLOBE VALVE SPECIFICATION

MANUF'S OFFER

TAG NO. : 52401 **RATING :** 300 **STANDARD :** BS-1873

SIZE RANGE : 2.00 " TO 12.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : B1A,B9A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
BONNET	BOLTED	ASTM A 216 GR.WCB		
STEM	RISING	13% CR.STEEL (NO CASTING)		
DISC	LOOSE PLUG TYPE/BALL TYP	13% CR STEEL FACING/13% CR STEEL		
BODY SEAT RING	RENEWABLE/NON RENEWABLE	STELLITED		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR B7		
BONNET NUTS		ASTM A194 GR 2H		
BONNET GASKET		SP WND SS316-GRAFOIL FILLER		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
OTHERS	O S & Y			
SPECIAL SERVICE CONDITION		MAX TEMP 427 DEG.C.		
BACK SEAT & SHOULDER		13% CR STEEL		
HYDROSTATIC TEST PRESSURE	BODY : 1125 PSIG	SEAT : 825 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.
2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".
3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.
4 TESTING SHALL BE AS PER BS EN 12266-1.
5 10% VALVE CASTINGS SHALL UNDERGO RADIOGRAPHIC EXAMINATION.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6	7
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018	9-Dec-2019

52401

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Client : NRL | **Dept. / Sect :** 16/43

Project : DCU Revamp, NRLP

Location : NUMALIGARH , ASSAM | **Tag No : 52413** | **Sheet No.** 1 of 1

GLOBE VALVE SPECIFICATION

MANUF'S OFFER

TAG NO. : 52413 **RATING :** 300 **STANDARD :** BS-1873

SIZE RANGE : 2.00 " TO 12.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : B19A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
BONNET	BOLTED	ASTM A 216 GR.WCB		
STEM	RISING	SS 316; (NO CASTING)		
DISC	LOOSE PLUG TYPE/BALL TYP	SS316		
BODY SEAT RING	RENEWABLE/NON RENEWABLE	SS316		
STEM PACKING	RENEWABLE WITH VALVE OPEN ON STREAM	CORROSION INHIBITED DIE FORMED FLEXIBLE GRAPHITE WITH BRAIDED ANTI EXTRUSION RINGS		
HAND WHEEL	RISING	MALLEABLE IRON/CAST ST/FAB.ST/DUCT. IRON		
BONNET BOLTS		ASTM A193 GR B7		
BONNET NUTS		ASTM A194 GR 2H		
BONNET GASKET		SP WND SS316-GRAFOIL FILLER		
REQUIREMENT OF GEAR OPERATOR		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
OTHERS	O S & Y			
SPECIAL SERVICE CONDITION		CAUSTIC SERVICE(MAX.TEMP.110 DEG.C) & AMINE		
BACK SEAT & SHOULDER		SS316		
HYDROSTATIC TEST PRESSURE	BODY : 1125 PSIG	SEAT : 825 PSIG		
TEST PRESSURE WITH AIR	80 PSIG			

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.

2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".

3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.

4 TESTING SHALL BE AS PER BS EN 12266-1.

5 50% VALVE CASTINGS SHALL UNDERGO RADIOGRAPHIC EXAMINATION.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6	7
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018	9-Dec-2019

52413

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Client :	NRL	**Dept. / Sect :**	16/43
Project :	DCU Revamp, NRLP		
Location :	NUMALIGARH , ASSAM	**Tag No : 53301**	**Sheet No.** 1 of 1

CHECK VALVE SPECIFICATION | **MANUF'S OFFER**

TAG NO. : 53301 **RATING :** 150 **STANDARD :** BS 1868

SIZE RANGE : 2.00 " TO 24.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH

PIPING CLASS : A1A,A32A,A9A

STANDARD :
MFGRS CAT/FIG :
(For category -II MRs only)
RATING : **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
COVER	BOLTED	ASTM A 216 GR.WCB		
DISC		FACED WITH 13% CR.STEEL/13% CR.STEEL		
BODY SEAT RING	RENEWABLE/NON RENEWABLE	STELLITED		
HINGE PIN		13% CR STEEL(NO CASTING)		
DISC HINGE		13% CR STEEL/A216 GR WCB/A515 GR 70		
COVER STUD BOLT		ASTM A193 GR B7		
COVER NUT		ASTM A194 GR 2H		
COVER GASKET		SP WND SS316-GRAFOIL FILLER/CORRUGATED SS316		
BY PASSES				
TYPE	SWING CHECK TYPE			
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
OTHERS				
SPECIAL SERVICE CONDITIONS		MAX TEMP 371 DEG. C.		
WASHER,NUT,PIN		13% CR STEEL(NO CASTING)/SS410/SS304		
HYDROSTATIC TEST PRESSURE	BODY : 450 PSIG	SEAT : 325 PSIG		
TEST PRESSURE WITH AIR				

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.
2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".
3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.
4 TESTING SHALL BE AS PER BS EN 12266-1.
5 5% VALVE CASTINGS SHALL UNDERGO RADIOGRAPHIC EXAMINATION.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6	7
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018	9-Dec-2019

53301

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Client :	NRL	**Dept. / Sect :**	16/43
Project :	DCU Revamp, NRLP		
Location :	NUMALIGARH , ASSAM	**Tag No : 53402**	**Sheet No.** 1 of 1

CHECK VALVE SPECIFICATION	**MANUF'S OFFER**
TAG NO. : 53402 **RATING :** 300 **STANDARD :** BS-1868 **SIZE RANGE :** 2.00 " TO 24.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH **PIPING CLASS :** B2A	**STANDARD :** **MFGRS CAT/FIG :** **(For category -II MRs only)** **RATING :** **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 216 GR.WCB		
COVER	BOLTED	ASTM A 216 GR.WCB		
DISC		13% CR STEEL FACING/13% CR. STEEL		
BODY SEAT RING	RENEWABLE/NON RENEWABLE	STELLITED		
HINGE PIN		13% CR STEEL(NO CASTING)		
DISC HINGE		13% CR. STEEL/A216 GR WCB/A515 GR 70		
COVER STUD BOLT		ASTM A193 GR B7		
COVER NUT		ASTM A194 GR 2H		
COVER GASKET		SP WND SS316-GRAFOIL FILLER		
BY PASSES				
TYPE	SWING CHECK TYPE			
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
OTHERS				
SPECIAL SERVICE CONDITIONS	I.B.R	STEAM/CONDENSATE/BOILER FEED WATER; MAX TEMP. 427 DEG.C.		
WASHER,NUT,PIN		13% CR STEEL(NO CASTING)/SS 410/SS 304		
HYDROSTATIC TEST PRESSURE	BODY : 1125 PSIG	SEAT : 825 PSIG		
TEST PRESSURE WITH AIR				

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.

2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".

3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.

4 TESTING SHALL BE AS PER BS EN 12266-1 & IBR

5 ALL VALVES SHALL BE SUPPLIED WITH IBR CERTIFICATE IN FORM-III C.

6 ALL VALVES SHALL BE PAINTED RED ON BODY-COVER JOINT.

7 10% VALVE CASTINGS UPTO 16" AND 100% VALVE CASTINGS 18" AND ABOVE SHALL UNDERGO RADIOGRAPHIC EXAMINATION.

8 VALVES TO COMPLY WITH DESIGN REQUIREMENTS OF IBR ALSO.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6	7
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018	9-Dec-2019

53402

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Client :	NRL	**Dept. / Sect :**	16/43
Project :	DCU Revamp, NRLP		
Location :	NUMALIGARH , ASSAM	**Tag No : 53439**	**Sheet No.** 1 of 1

CHECK VALVE SPECIFICATION	**MANUF'S OFFER**
TAG NO. : 53439 **RATING :** 300 **STANDARD :** BS-1868 **SIZE RANGE :** 2.00 " TO 24.00 " **ENDS :** FLGD TO B-16.5 RF/125AARH **PIPING CLASS :** B4G	**STANDARD :** **MFGRS CAT/FIG :** **(For category -II MRs only)** **RATING :** **ENDS :**

DESCRIPTION	CONSTRUCTION	MATERIAL	CONSTRUCTION	MATERIAL
BODY	CAST	ASTM A 217 GR.C12 (NORM. & TEMP.)		
COVER	BOLTED	ASTM A 217 GR.C12 (NORM. & TEMP.)		
DISC		STELLITED		
BODY SEAT RING	RENEWABLE/NON-REN EWABLE	STELLITED		
HINGE PIN		13% CR STEEL(NO CASTING)		
DISC HINGE		13% CR STEEL /A217 GR C12(NORM & TEMP)		
COVER STUD BOLT		ASTM A193 GR B16		
COVER NUT		ASTM A194 GR 4/GR 7		
COVER GASKET		SP WND SS316-GRAFOIL FILLER		
BY PASSES				
TYPE	SWING CHECK TYPE			
REQUIREMENT OF RADIOGRAPHY		REFER TECHNICAL NOTES FOR PURCHASE OF VALVES.		
OTHERS				
SPECIAL SERVICE CONDITIONS		MAX TEMP 538 DEG. C.		
WASHER,NUT,PIN		13% CR STEEL(NO CASTING)		
HYDROSTATIC TEST PRESSURE	BODY : 1125 PSIG	SEAT : 825 PSIG		
TEST PRESSURE WITH AIR				

NOTES

1 THIS VALVE SPEC SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES, 6-44-0052.

2 ONLY IN THE CASE OF CATEGORY - II MRs,BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR AND WHEREVER BIDDER AGREES WITH EIL'S SPEC BIDDER SHALL INDICATE "AGREED".

3 NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC IS ALLOWED.

4 TESTING SHALL BE AS PER BS EN 12266-1.

5 10% VALVE CASTINGS UPTO 16" AND 100% VALVE CASTINGS 18" AND ABOVE SHALL UNDERGO RADIOGRAPHIC EXAMINATION.

SIGNATURE & SEAL OF MANUFACTURER

SHEET REV NO.	2	3	4	5	6
DATE	2-Jan-1995	14-Dec-2000	28-May-2001	30-Jun-2009	26-Apr-2018

53439

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पेट्रोलियम रिफाइनरी वातावरण में सॉर सर्विस में इस्तेमाल होने वाले कार्बन स्टील अवयवों हेतु सामग्री अपेक्षा

MATERIAL REQUIREMENTS FOR CARBON STEEL COMPONENTS USED IN SOUR SERVICE IN PETROLEUM REFINERY ENVIRONMENTS

Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	
2	05 07.19	REAFFIRMED AND RE-ISSUED	SM	DD	SG	RKT
1	07 10.11	REVISED & ISSUED AS STANDARD SPECIFICATION	AR	SG	PPL	DM
0	07 10 04	REVISED & ISSUED AS STANDARD SPECIFICATION	GM	VRK	KKM	SKG

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Abbreviations:

ANSI	:	American National Standards Institute
API	:	American Petroleum Institute
ASME	:	American Society of Mechanical Engineers
ASTM	:	American Society for Testing and Materials
ISO	:	International Organization for Standardization
NACE	:	National Association of Corrosion Engineers

Materials & Coating Standards Committee:

Convener : Mr. S.Ghosal

Members :
Mr. Deepak Gupta (Projects)
Mr. M. Ismaeel (Piping)
Mr. K.J Harinarayan (SME)
Mr. D.C.Brahma (Structure)
Mr. R. Muthu Ramalingam (SCM)
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Mr. Naveen Parashar (Projects)
Mr. Satya Sridhar (Process-2)

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1.0 SCOPE

1.1 In general, for refinery services, NACE International Standard MR0103 shall be applicable. For refinery services where Hydrogen Induced Cracking (HIC) resistant carbon steel is specifically mentioned in the process documents, this specification shall be followed.

1.2 This specification lays down the requirements related to the chemical composition, manufacture, fabrication and testing requirements for carbon steel components intended to be used in sour service in petroleum refinery environments. These requirements are specified in order to make the carbon steel component resistant to the various forms of material damage in a sour environment, such as Sulfide Stress Cracking (SSC), Hydrogen Induced Cracking (HIC), Stress Oriented Hydrogen Induced Cracking (SOHIC), Blistering etc. These requirements can be used for resisting Alkaline Stress Corrosion Cracking (ASCC) also. This specification is applicable for corrosive petroleum refining facilities.

1.3 The service medium is defined as "Sour" when the service environment conforms to one of the following conditions, as defined in NACE International Standard MR0103:

Service environments containing free water (in liquid phase) and

(a) >50 ppmw dissolved H_2S in the free water,

(b) Free water pH < 4 and some dissolved H_2S present,

(c) Free water pH >7.6 and 20 ppmw dissolved hydrogen cyanide (HCN) in the water and some dissolved H_2S present,

(d) >0.003 MPa absolute (0.05psia) partial pressure H_2S in the gas in processes with a gas phase.

2.0 REFERENCED CODES/STANDARDS

NACE MR 0103	ASTM A 694	ASTM A 770
NACE RP 0472	ASTM A 216	ASTM A 370
NACE Publication 8X194 & 8X294	ASTM A 106	ASTM A 578
NACE TM 0284	API 5 L	ASME SEC II PART C
ASTM A 20	API 6 A	ASME SEC VIII-DIV.I
ASTM A 516	ASTM E 18	ASME SEC IX
ASTM A 105	ASTM E 45	ANSI B 16.34
ASTM A 234	ASTM E 92	ANSI B 31.3

All ASTM Standard designations shall be applicable for corresponding ASME designations which would be read as ASME SA XXX instead of ASTM A XXX.

3.0 GENERAL REQUIREMENTS

3.1 The steel for sour service shall be manufactured by either basic oxygen or electric arc furnace route and shall be fully killed and fine grained.

3.2 Carbon steel shall not contain intentional additions of elements such as lead, selenium or sulphur to improve machinability.

3.3 Carbon steel shall be used in one of the following heat treatment conditions.

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(i) Hot-rolled
(ii) Annealed
(iii) Normalised
(iv) Normalised and tempered
(v) Normalised, austenitised, quenched and tempered
(vi) Austenitised, quenched and tempered.

3.4 All material after cold forming shall be thermally stress relieved to meet a hardness requirement of 200 BHN maximum.

3.5 All products shall be free of low temperature transformation microstructures such as bainite bands or islets of martensite.

4.0 MATERIAL SPECIFICATION

All items are required to conform to the chemical composition of the respective specification as listed below.

Plate: ASME SA516 Gr.60

Pipe: ASME SA106 Gr. B or SA333 Gr.1 or 6

Forgings: ASME SA105 or SA350 Gr.LF1 or LF2 or SA266 Class 1

Fittings: ASME SA234 Gr. WCB or SA420 Gr.WPL6

Castings: ASME SA216 Gr. WCA, WCB or WCC or SA352 Gr. LCA, LCB or LCC

Tubing: ASME SA179 or SA214

5.0 PRODUCT SPECIFIC REQUIREMNTS

5.1 Plates and Rolled Products

All rolled products such as plates and sheets and fittings / pipes made of rolled products shall meet the following specific requirements.

5.1.1 The steel shall be made through a clean steel making route and shall have minimum of inclusions.

5.1.2 The sulphur level shall be restricted to 0.003 wt%.

5.1.3 The steel shall be calcium treated for inclusion morphology control and the Ca/S ratio shall be in the range of 2 to 3. When sulphur content is less than 0.0015%, then Ca/S ratio is not applicable and calcium can be present up to 50 ppm.

5.1.4 For plates including and above 25 mm thick, through-thickness tensile testing shall be carried out in accordance with ASTM A770, with minimum reduction in area being 35% as determined in accordance with ASTM A370, on one plate per heat.

5.1.5 No repair welding shall be permitted on plated.

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5.1.6 When the fabrication of the components from the previously HIC tested plates involves no heavy wall thickness reduction or material flow, such as bending, spinning or welding, no fresh HIC test would be required on the final product. However, for fabrication of products where heavy reduction of thickness and heavy flow of material is encountered while forming such as like forging, extrusion or drawing, metallographic examination of the final product shall be required to be carried out to ensure absence of elongated inclusions.

5.1.7 The plates shall be procured only from pre-qualified manufacturers.

5.2 Pre-qualification criteria for manufacturers/suppliers with prior experience track record

The manufacturers/suppliers who have proven track record of supplying materials for sour service applications in petroleum refineries to any of the process licensors such as UOP/IFP/EXXON/BP/CHEVRON or any of the reputed operating companies/consultants like ONGC/IOCL/HPCL/BPCL/EIL will be considered as 'pre-qualified manufacturers", on production of the relevant purchase orders and test certificates, certified by a witnessing third party inspection agency such as DNV/LLOYDS/BV/ABSTECH/TUV/SGS/CEIL for the conformance of the materials to the respective materials specification of the mentioned operators/engineering consultants. For pre-qualified vendors, Clause No. 5.4 is not applicable.

5.3 Pre-qualification criteria for new manufacturers/suppliers without track record

The manufacturers/suppliers who have no track record of supplying sour service materials to any of the process licensors or the reputed operating companies/consultants as mentioned in Clause No. 5.2 above, shall be considered as new manufacturers and shall be subjected to the elaborate pre-qualification by any one of the reputed third party inspection agencies like DNV/LLOYDS/BV/ABSTECH/TUV/SGS/CEIL as per the requirements.

5.4 Hydrogen Induced Cracking (HIC) Test

The requirements for HIC test shall be as follows.

(i) This test is required for manufacturers pre-qualification only.

(ii) This test shall be performed on a set of three specimens representing each production batch/heat of rolled products in accordance with NACE TM0284 with the following acceptance criteria:

(a) Crack Length Ratio (CLR) $\leq$ 10.0%
(b) Crack Sensitivity Ratio (CSR) $\leq$ 1%

(iii) In case of failure of any one of the specimens, three (3) more specimens from the same product shall be retested and all the specimens shall meet the acceptance criteria. In case of failure of any retest sample, the material shall be rejected.

6.0 POST WELD HEAT TREATMENT (PWHT) AND HARDNESS REQUIREMENT

All the weld joints, irrespective of thickness, shall be given a post weld heat treatment. The temperature range for PWHT is 595-650°C with a close control. Other aspects such as rate of heating, holding time etc. for PWHT shall be as per ASME Sec.VIII, Div.I /ANSI B31.3 requirements. The hardness of the weldment after PWHT shall be 200 BHN maximum.

Signature Not Verified
Digitally signed by ARNAB MONDAL
Date: 2026.05.07 16:08:13 IST
Location: eHrocure-EPROC

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