



NOTICE INVITING TENDER

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Ref: OS/SC/2025-26/98/59

Date: 04.10.2025

Sub: Service contract for carrying out HAZOP & SIL study for IOCL- DIGBOI (S.O.8188)- Reg.

Tenders are invited under **two bid system**, Techno-Commercial Bid (Part-I) and Price Bid (Part-II) from the reputed and experienced contractors with sound technical and financial capability for the subject work.

SL. NO.	NAME OF THE WORK
01	Service contract for carrying out HAZOP & SIL study for IOCL- DIGBOI (S.O.8188)

1. PRE- QUALIFICATION REQUIREMENT (PQR):

Tenderer should enclose Certificate of incorporation / Firm registration, EPF, ESI/Employee Group Insurance, PAN, GSTIN registration no., Income tax returns for last three years (AY 2022-23, 2023-24 & 2024-25).

- I) The Contractor should have experience of completing similar works during the last 7 years ending **30th September 2025**. Any Single similar work order & Job Completion Certificate from the customer shall be enclosed in support of successful and satisfactory completion of the order.

Note:

Similar work means carrying out HAZOP & SIL study in any Power plant or process Industry on regular contract basis for State / Central Govt. or Undertakings or Private Firms.
The works executed in the own name of the tenderer will only be considered for eligibility criteria.

Note: While scrutiny it is found that If any bidder has made false declaration and/ or provided false information and/ or forged documents or has forged BHEL documents, certificates etc. for securing business, meeting PQR, such offers shall be rejected and action will be initiated as per BHEL extant Guide lines.

2. SCOPE OF WORK

Work is to be carried out as per document No: 4DS-003-U1010 & 4DS-003-U1011

3. LOCATION OF WORK:

The subject work is to be carried out at BHEL- HPVP, Visakhapatnam or at TECHNIP, Noida. Same shall be confirmed after placement of order.

4. WORK COMPLETION PERIOD:

Work shall be completed within 45 Days from the date of Intimation by Engineer In-charge

5. EARNEST MONEY DEPOSIT:

Not applicable

6. INCOME TAX:

Income tax will be deducted from the payment made to the contractor as per applicable GOI guidelines and TDS certificate will be issued to this effect.

7. TDS ON GST:

TDS on GST amount as per statutory requirement as applicable will be deducted on each payment made to the contractor. Present TDS on GST is 2%.

8. SECURITY DEPOSIT:

A. Security deposit means the security provided by the contractor towards fulfilment of any obligations in terms of the provisions of the contract.

B. The total amount of the security deposit will be **5%** of the contract value.

C. Modes of Deposit:

The required amount of Security Deposit of **5%** of the contract value may be accepted in the following forms:

- a) Cash (as permissible under the extant Income Tax Act)
- b) Local Cheques of Scheduled Banks (subject to realization)/ Pay Order/ Demand Draft/ Electronic Fund Transfer in favour of BHEL.
- c) Bank Guarantee from Scheduled Banks/ Public Financial Institutions as defined in the company's act. The bank guarantee format should have the approval of BHEL.
- d) Fixed Deposit Receipt issued by Scheduled Banks/ Public Financial Institutions as defined in the company's act (FDR should be in the name of the contractor, a/c BHEL).
- e) Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL)
- f) Insurance Surety Bonds.

(Note: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith)

D. Collection of Security deposit:

At least 50% of the required Security Deposit, including the EMD, should be collected before start of the work. Balance of the Security Deposit can be collected by deducting 10% of the gross amount progressively from each of the running bills of the Contractor till the total amount of the required Security Deposit is collected.

In case of delay in submission of performance security, enhanced performance security which would include interest (Repo rate + 4%) for the delayed period, shall be submitted by the bidder.

If the value of work done at any time exceeds the contract value, the amount of Security Deposit shall be correspondingly enhanced and the additional Security Deposit shall be immediately deposited by the Contractor or recovered from payment/s due to the Contractor.

The recoveries made from running bills (cash deduction towards balance SD amount) can be released against submission of equivalent Bank Guarantee in acceptable form, but only once, before completion of work, with the approval of the authority competent to award the work.

Note: In case of (a) small value contracts not exceeding Rs. 20 lakhs or (b) SAS jobs, work can be started before the required Security Deposit is collected. However, payment can be released only after collection/ recovery of initial 50% Security Deposit.

E. Refund of Security Deposit:

- i. The security deposit shall be refunded after successful completion of the Contract as per agreement and subject to deduction of any amount due to BHEL.
- ii. Security deposit shall not be refunded to the Contractor except in accordance with the terms of the Contract.

- iii. The successful tenderers shall furnish Security Deposit within 15 days from the date of Work Order / Letter of Intent. The Security Deposit shall be furnished by the successful tenderers before commencement of work by them.
- iv. The security deposit shall not carry any interest.

Note: Acceptance of Security Deposit against Sl. No. (d) and (e) above will be subject to hypothecation or endorsement on the documents in favour of BHEL. However, BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith).

Security Deposit / Bank Guarantee will be released after the **closure of contract**.

9. LIQUIDATED DAMAGES / PENALTY:

If the Contractor fails to complete the job within the stipulated delivery period / work completion period, the Buyer will be entitled to deduct/recover the Liquidated Damages for the delay @ 0.5% of the contract value per week subject to a maximum of **10%** of the contract value.

10. PAYMENT TERMS:

100% Bill payment will be arranged within 45 days for MSE / 60 days for Medium / 90 days from the date of submission of bill.

Bill to be submitted to Engineer-in-charge along with following documents:

- a) Invoice
- b) Job completion certificate issued by the Engineer-in-charge
- c) Proof of GST payment as per Annexure - GST.
- d) RTGS form/ Bank account details in prescribed format
- e) WAM 07 duly filled & signed
- f) For any reduction in the Invoice value, Credit Note (under GST Act) to be issued by vendor and vice versa.
- g) In case of release of security deposit, WAM-10 to be filled and submitted.

Note. All payments will be released through RTGS/ NEFT only.

11. PRICE SCHEDULE, TAXES & DUTIES:

- a. Prices shall be quoted in GeM Portal for the complete scope of work.
- b. **The quoted prices shall be inclusive of GST.** However, GST as applicable shall be payable by contractor & the same will be reimbursed as per Annexure - GST.
- c. In addition to existing taxes, any new taxes imposed by Central/ State Govt. shall be payable by the contractor and same shall be reimbursed on submission of relevant documents / proof of payment.
- d. In case, any new tax is imposed instead of existing tax, difference of the amount shall be reimbursed / recovered on submission of documentary evidence.
- e. In case, any new tax is imposed by Central / State Govt. or there is any variation in taxes after expiry of delivery / contract period, the same shall be borne by the contractor only.
- f. All terms & conditions of the contract in respect of taxes & duties are subject to new taxation laws introduced time to time by Govt. and terms & conditions will be deemed to be modified in accordance with the provisions of New Laws (i.e., GST).
- g. **The quoted prices shall be fixed & firm without any escalation during the entire period of contract and till completion of the work.**

12. VALIDITY OF OFFER:

The offer shall be valid for a period of **Two Months** from the last date for tender submission.

13. RISK PURCHASE:

In case the contractor fails to execute the work due to any reason, BHEL reserves the right to get the same completed through some other party at the risk & cost of the contractor and any additional expenditure incurred due to the same and overhead charges shall be charged to the contractor. Risk & Cost will be implemented as per STANDARD OPERATING PROCEDURE FOR IMPLEMENTATION OF RISK & COST of BHEL.

14. REVERSE AUCTION:

Reverse auction will be conducted in GeM portal with the technically qualified bidders

15. GENERAL:

a. Bidders shall confirm their acceptance to all the terms & conditions of the tender enquiry.

Deviations to the tender conditions are not acceptable and BHEL-HPVP reserves the right to reject such offers which do not meet Technical / Commercial requirements without any / further correspondence.

Bids not accompanied with requisite documents / delayed bids, incomplete / conditional offers, bids not conforming to the terms & conditions specified in the tender documents are liable for rejection.

b. BHEL reserves the right to modify or cancel or short close the tender at any stage at its discretion without assigning any reason thereof.

c. The bidders shall study the tender documents, drawings and all other relevant documents in detail for understanding the scope of work involved in various items before submission of offers.

d. For any clarifications required on this tender document, scope of work etc., the bidders shall depute their authorized representatives to HPVP, Visakhapatnam with prior intimation to get clarifications from concerned authorities.

e. Sr Manager (Engg) shall be the Engineer-in-charge for herein after referred to as such in the tender. Contact Details: Ph: 0891-288- 1134, email: amit.sawaiyan@bhel.in

f. Lowest offer need not be the rate acceptable to BHEL-HPVP and BHEL-HPVP reserves the right for negotiation with the bidder.

g. The following documents (enclosed) shall form part of the contract including this Notice Inviting Tender:

- | | |
|--|------------------|
| a) General Conditions of Contract (Works/ Service) | : Annexure – I |
| b) Acceptance to the tender terms & conditions | : Annexure – II |
| c) Contractor Information | : Annexure – III |
| d) Check List | : Annexure - IV |
| e) Price Bid (Schedule of Quantities & Rates) | : Annexure – V |

16. COMPENSATION IN CASES OF DEATH/ PERMANENT INCAPACITATION OF PERSON DUE TO UNINTENDED/ UNFORESEEN OCCURRENCES DURING MANUFACTURING/ OPERATION AND WORK AT BHEL FACTORIES / OFFICES:

BHEL shall recover the amount of compensation paid to victim(s) by BHEL towards loss of life / permanent disability due to an accident which is attributable to the negligence of contractor, agency or firm or any of its employees as detailed below.

- a) Victim: Any person who suffers permanent disability or dies in an accident as defined below.
- b) Accident: Any death or permanent disability resulting solely and directly from any unintended and unforeseen injurious occurrence caused during the manufacturing / operation and works incidental thereto at BHEL factories / offices and precincts thereof, project execution, erection and commissioning, services, repairs and maintenance, trouble shooting, servicing, overhaul, renovation and retrofitting, trial operation, performance guarantee testing undertaken by company or during any works/during working at BHEL units/offices/townships and premises/project sites.
- c) Compensation in respect of each of the victims:
 - (i) In the event of death or permanent disability resulting from Loss of both limbs: ₹10,00,000/- (Rupees Ten Lakhs)
 - (ii) In the event of other Permanent disability: ₹7,00,000/- (Rupees Seven Lakhs)
- d) Permanent Displacement: A displacement that is classified as a permanent total disablement under the provision to Section 2(I) of the Employees Compensation Act, 1923".

17. TENDER SUBMISSION

a) The Bid shall be submitted in Two parts

Part-I Bid should contain following documents:

- (i) Certificate of incorporation / Firm registration
- (ii) Copy of EPF, ESI/Employee Group Insurance
- (iii) Copy of GSTIN Registration Certificate.
- (iv) Copy of PAN card.
- (v) Udyam Registration (MSE) Certificate (if any)
- (vi) Income tax returns for last three years (AY 2022-23, 2023-24 & 2024-25)
- (vii) Similar work order & work completion certificate
- (viii) Bank a/c details as per Annexure NEFT / Bank Cheque copy of Company
- (ix) Signed & Sealed NIT copy along with all annexures

Part-II Bid

- (i) Price Bid:

b) The tender completed in all respects shall be submitted through GeM portal latest by 14.00 hrs. on or before 14.10.2025.

Offers received in any other form will not be accepted.

- c) Submission of offer by a tenderer implies that all the tender documents were read by the tenderer and the tenderer is aware of the scope and specifications of the work, site condition, local conditions and rates at which stores, tools and plant, free / chargeable materials etc., will be issued to him by BHEL - HPVP and other factors having bearing on the execution of the work.**

18. OPENING OF TENDERS:

Part-I Bids will be opened on **14.10.2025 at 14.30 Hrs.** through GeM portal.

19. BREACH OF CONTRACT:

In case of Breach of Contract, 10% of the contract value will be recovered from the contractor and necessary action will be initiated as per contract terms and conditions and BHEL extant Guide Lines.

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CHAPTER -1**1. GENERAL INSTRUCTION TO TENDERERS****1.1. DESPATCH INSTRUCTION**

- i) The General Conditions of Contract form part of the Tender specifications. **For this tender, bidders shall use electronic Signature viz Digital Signature Certificate while uploading the tender documents on the e-procurement portal.** The information furnished shall be complete by itself. The tenderer is required to furnish all the details and other documents as required in the following pages.
- ii) Tenderers are advised to study all the tender documents carefully. Any submission of tender by the tenderer shall be deemed to have been done after careful study and examination of the tender documents and with the full understanding of the implications thereof. Should the tenderers have any doubt about the meaning of any portion of the Tender Specification or find discrepancies or omissions in the drawings or the tender documents issued are incomplete or shall require clarification on any of the technical aspect, the scope of work etc., he shall at once, contact the authority inviting the tender well in time (so as not to affect last date of submission) for clarification before the submission of the tender. Tenderer's request for clarifications shall be with reference to Sections and Clause numbers given in the tender documents. The specifications and terms and conditions shall be deemed to have been accepted by the tenderer in his offer. Non-compliance with any of the requirements and instructions of the tender enquiry may result in the rejection of the tender.
- iii) Integrity pact (IP) shall be applicable for all tenders / contracts if indicated in NIT. This IP shall be issued as part of the Tender documents and shall be submitted by the bidder along with Techno-commercial bid duly filled, signed and stamped by the authorized signatory who signs the bid. . Entering into this pact shall be a preliminary qualification.

1.2. SUBMISSION OF TENDERS

- 1.2.1. The tenderers must submit their tenders to Officer inviting tender as per instructions in the NIT.
- 1.2.2. Tenders shall be submitted through E-Procurement portal as per instruction in NIT. Tenderers to upload offers well in advance in order to avoid last minute congestion in e-procurement website. However, after submission of the tender, the tenderer can re-submit revised tender but before due date and time of submission of tender as notified.
- 1.2.3. Tenders shall be opened by Officer of BHEL at the time and date as specified in the NIT. For this tender, bidders may attend through online mode, if provisions are available in e-procurement portal.
- 1.2.4. Tenderers whose bids are found techno commercially qualified shall be notified through e-procurement system about the date and time of opening of the Price Bids. BHEL's decision in this regard shall be final and binding.
- 1.2.5. The information given in the tender documents is for general guidance and shall not be construed as contractually binding on BHEL/ Owner. All relevant site data/ information as may be necessary for bidding shall have to be obtained/ collected by the Tenderer.
- 1.2.6. The Tenderers are advised to physically visit the site to acquaint and satisfy themselves about the weather conditions, working culture in the area, socio-political environment, safety & security aspects, law & order situation, law of the land, transportation routes, various distances, surroundings of plant/ project premises together with all statutory, obligatory, mandatory requirements of various authorities and obtain for themselves all necessary information as to the risks, contingencies and all other circumstances, which may influence or affect the discharge of various obligations under the Contract during contract period including extended period (if any).

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1.2.7. The submission of bid will tantamount to due diligence having been done and it shall be deemed that:

- a) the Tenderer has obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Works
- b) the Tenderer accepts total responsibility for having foreseen all difficulties and costs of successfully completing the Works
- c) the Tenderer accepts that, the Contract Price shall not be adjusted to take account of any unforeseeable or unforeseen difficulties or costs and the Tenderer shall not raise any claims/ disputes against BHEL and/ or Owner at later date in any manner whatsoever.

1.2.8. The Tenderer shall mandatorily be required to submit “Site Visit Confirmation Declaration” along with the Technical Bid.

1.3. **LANGUAGE**

1.3.1 The tenderer shall quote the rates in English language and international numerals. These rates shall be entered in figures as well as in words. Tenderers are requested to refer the clauses of NIT/ Vol-II “Price Bid” for more details. For the purpose of the tenders, the metric system of units shall be used.

1.3.2 All entries in the tender shall either be typed or written legibly in ink. Erasing and over-writing is not permitted and may render such tenders liable for rejection. All cancellations and insertions shall be duly attested by the tenderer.

1.4 **PRICE DISCREPANCY:**

1.4.1 **Price Bid opening:** During opening of price bids, if there is any difference between the amount in figures and in words, the amount quoted by the bidder in words shall be taken as correct.

1.4.2 **Reverse Auction:** In case of Reverse Auction, the successful bidder shall undertake to execute the work as per overall price offered by him during the Reverse Auction process. (Guidelines as available on www.bhel.com on “supplier registration page”).

1.5 **QUALIFICATION OF TENDERERS**

- i) Only tenderers who have previous experience in the work of the nature and description detailed in the Notice Inviting Tender and/or tender specification are expected to quote for this work duly detailing their experience along with offer.
- ii) Offers from tenderers who do not have proven and established experience in the field shall not be considered.
- iii) The offers of the bidders who are on the debarred list shall be rejected. Further, offer of the bidders, who engage the services of the debarred firms or associated with the debarred firm, for present bid, shall also be rejected. The list of debarred firms is available on BHEL web site www.bhel.com. (Refer clause 28.0 of NIT).
- iv) Offers from tenderers who do not comply with the latest guidelines of Ministry/Commissions of Govt. of India shall not be considered.

1.6. **EVALUATION OF BIDS**

- i) Technical Bids submitted by the tenderer will be opened first and evaluated for fulfilling the Pre-Qualification criteria and other conditions in NIT/Tender documents, based on documentary evidences submitted along with the offer.
- ii) In case the same qualifying experience is claimed by more than one agency, then:
 - a. The agency who has executed the work as per documentary evidence submitted shall only be qualified. Scope of qualifying work should be totally with the agency who has executed and in case it is only labour and consumables without T&P, then the credentials of execution is assigned to the first agency and not to the agency who has executed only as labour supply contractor. Further, BHEL reserves the right to ask for any other proof for the said job.

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- b. However, if the same is on account of subletting, part of scope by one agency to another agency in a project of BHEL, experience of both the agencies may be considered for the sublet portion of the work provided subletting has been done with the approval of BHEL.
- iii) In case the qualifying experience is claimed by bidder is based on 'Work Order' and 'Experience Certificates' from any organization other than BHEL (main agency), then it shall be the responsibility of the bidder to submit (in addition to the experience certificate from main agency) relevant certificate regarding qualifying experience from the end Customer or the Turnkey-Contractor (if any) who has awarded the work to main agency, as a proof for having executed subject qualifying work. BHEL reserves the right to ask for any other proof for the said job.
- iv) Assessing Bidder's Capacity for executing the current tender shall be as per Notice Inviting Tender.
- v) Price Bids of shortlisted bidders shall only be opened through the electronic price bid opening with/without Reverse Auction, at the discretion of BHEL. Unless specified otherwise in the tender, the L1 bidder amongst all the shortlisted bidders shall be considered for award. However, the L1 bidder shall have no claim on the award & BHEL reserves the right to award the tender at its sole discretion.
- vi) Price Bids of unqualified bidders shall not be opened. Reasons for rejection shall be intimated in due course either through system generated e-mail or through letter/e-mail after award to successful bidder.
- vii) Bidders are advised to also refer to clause no 2.9.4 regarding evaluation of their performance in ongoing projects.

1.7. DATA TO BE ENCLOSED

Full information shall be given by the tenderer in respect of the following. Non submission of this information may lead to rejection of the offer.

- i) **INCOME TAX PERMANENT ACCOUNT NUMBER**
Certified copies of Permanent Account Numbers as allotted by Income Tax Department for the Company/Firm/Individual Partners etc. shall be furnished along with tender.
- ii) **ORGANIZATION CHART**
The organization chart of the tenderer's organization, including the names, addresses and contact information of the Directors/Partners shall be furnished along with the offer.
- iii) An attested copy of the Power of Attorney, in case the tender is signed by an individual other than the sole proprietor.
- iv) **IN CASE OF INDIVIDUAL TENDERER:**
His / her full name, address, PAN and place & nature of business.
- v) **IN CASE OF PARTNERSHIP FIRM:**
The names of all the partners and their addresses, copy of the partnership deed/instrument of partnership duly certified by the Notary Public shall be enclosed.
- vi) **IN CASE OF COMPANIES:**
 - a) Date and place of registration including date of commencement certificate in case of Public Companies (certified copies of Memorandum and articles of Association are also to be furnished).
 - b) Nature of business carried on by the Company and the provisions of the Memorandum relating thereof.

1.8 AUTHORIZATION AND ATTESTATION

Tenders shall be signed by a person duly authorized/empowered to do so, for which a Power of Attorney is to be submitted along with the tender offer. For company, a Power of Attorney (as per format in Volume-I D) shall be submitted.

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1.9 EARNEST MONEY DEPOSIT

1.9.1 Every tender must be accompanied by the prescribed amount of Earnest Money Deposit (EMD) in the manner described herein.

- i) EMD shall be furnished before tender opening / along with the offer in full as per the amount indicated in the NIT.
- ii) **The EMD up to an amount of Rs. 2 Lakh** is to be paid only in the following forms:
 - a) Cash deposit as permissible under the extant Income Tax Act (before tender opening).
 - b) Electronic Fund Transfer credited in BHEL account (before tender opening).
 - c) Banker's cheque / Pay order / Demand draft, in favour of 'Bharat Heavy Electricals Limited' and payable at Regional HQ issuing the tender (along with offer).
 - d) Fixed Deposit Receipt (FDR) issued by Scheduled Banks/ Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL) duly marking lien in favour for BHEL (along with offer). The Fixed Deposit in such cases shall be valid for at least six months from the due date of tender submission.
 - e) Insurance Surety Bonds
 - f) **In case EMD amount is more than Rs. Two Lakhs**, Tenderer has the option to submit the amount in excess of Rs. Two lakhs in the forms described above in clause no. 1.9.1. ii) (a) to (e) or in the form of Bank Guarantee from Scheduled Bank (along with the Offer). The Bank Guarantee in such cases shall be valid for at least six months from the due date of tender submission. The Bank Guarantee format for EMD shall be in the prescribed formats.
- iii) No other form of EMD remittance shall be acceptable to BHEL.
- iv) Proof of EMD: Bidder shall upload the scanned copy of EMD along with bid submission through BHEL e-procurement Portal. However, for the purpose of realization, the bidder shall send the demand draft/ banker's cheque/ pay order/ Bank Guarantee/ FDR/ Insurance Surety Bonds, in original, to the designated officer through post/courier or by hand within reasonable time.

1.9.2 EMD by the Tenderer will be forfeited as per NIT conditions, if:

- i) After opening the tender and within the offer validity period, the tenderer revokes his tender or makes any modification in his tender which is not acceptable to BHEL.OR
- ii) The successful Contractor, on whom the work has been awarded, fails to deposit the required Security deposit or commence the work within the period as per LOI/ LOA/ Contract or refuse to accept the LIO/LOA/Contract.
EMD by the tenderer shall be withheld in case any action on the tenderer is envisaged under the provisions of extant "Guidelines on Suspension of business dealings with suppliers/ contractors" of BHEL and forfeited/ released based on the action as determined under these guidelines.

1.9.3 EMD shall not carry any interest.

1.9.4 EMD given by all unsuccessful tenderers shall be refunded normally within fifteen days of award of work.

1.9.5 Cash portion of EMD of successful tenderer will be retained as part of Security Deposit. EMD submitted in the form of Bank Guarantee/ FDR shall be retained by BHEL until the receipt of the Security Deposit.

1.10 SECURITY DEPOSIT

1.10.1 Upon acceptance of Tender, the successful bidder shall be required to deposit the 5% of the contract value as Security Deposit towards fulfilment of any obligations in terms of the provisions of the contract.

1.10.2 The Security Deposit shall be furnished before start of the work by the contractor.

1.10.3 The required Security Deposit may be accepted in the following forms.

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- i) Cash (as permissible under the extant Income Tax Act).
- ii) Local cheques of Scheduled Banks (subject to realization)/ Pay Order/ Demand Draft/ Electronic Fund Transfer in favour of BHEL.
- iii) Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL).
- iv) Bank Guarantee from Scheduled Banks/ Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format for Security Deposit shall be in the prescribed formats.
- v) Fixed Deposit Receipt issued by Scheduled Banks/ Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL). Specific lien in favour of BHEL on the FDR shall be marked and letter from the Bank having created such lien in the format shall be submitted along with FDR.
- vi) Insurance Surety Bonds.

Note:

- i. BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith.
- ii. In case of delay in submission of Security Deposit, enhanced security deposit which would include interest (Repo rate + 4%) for the delayed period, shall be submitted by the bidder before submission of first bill

1.10.4 The Security Deposit shall not carry any interest.

1.10.5 In case the value of work exceeds the awarded / accepted value, the Security Deposit shall be correspondingly enhanced as given below:

- i) The enhanced part of the Security Deposit shall be immediately deposited by the Contractor or adjusted against payments due to the Contractor.
- ii) Contract value for the purpose of operating the increased value of Security Deposit due to Quantity Variation, shall be exclusive of Price Variation Clause, Over Run Compensation and Extra works done on man-day rates.
- iii) The recoveries made from running bills can be released against submission of equivalent Bank Guarantee in acceptable form, but only once, before completion of work, with the approval of competent authority of BHEL.

1.10.6. The validity of Bank Guarantees towards Security Deposit shall be valid till actual completion of work + Guarantee Period + 3 months,.

1.10.7 BHEL reserves the right of forfeiture of Security Deposit in addition to other claims, damages and remedies in the event of the Contractor's failure to fulfill any of the contractual obligations or in the event of termination of contract as per terms and conditions of contract. BHEL reserves the right to set off the Security Deposit against any claims of other contracts with BHEL by giving prior notice to the contractor.

1.11 RETURN OF SECURITY DEPOSIT

Security Deposit shall be released to the contractor upon fulfilment of contractual obligations as per terms of the contract including completion of Guarantee Period after deducting all expenses / other amounts due to BHEL under the contract.

1.12 BANK GUARANTEES

Where ever Bank Guarantees are to be furnished/submitted by the contractor, the following shall be complied with

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- i) Bank Guarantees shall be from Scheduled Banks / Public Financial Institutions as defined in the Companies Act. Bank Guarantees issued by Co-Operative Banks/ Financial Institutions shall not be accepted.
- ii) The Bank Guarantees shall be as per prescribed formats.
- iii) It is the responsibility of the bidder to get the Bank Guarantees revalidated/extended for the required period as per the advice of BHEL Site Engineer / Construction Manager. BHEL shall not be liable for issue of any reminders regarding expiry of the Bank Guarantees.
- iv) In case extension/further extensions of any Bank Guarantees are not required, the bidders shall ensure that the same is explicitly endorsed by the Construction Manager and submitted to the Regional HQ issuing the LOI/LOA.
- v) In case the Bank Guarantees are not extended before the expiry date, BHEL reserves the right to invoke the same by informing the concerned Bank in writing, without any advance notice/communication to the concerned bidder.
- vi) Bidders to note that any corrections to Bank Guarantees shall be done by the issuing Bank, only through an amendment in an appropriate non judicial stamp paper.
- vii) The Original Bank Guarantee shall be submitted to Subcontracting Department of CPC (Central Procurement Cell) - PSHQ of BHEL unless specified otherwise in TCC.

1.13 VALIDITY OF OFFER

The rates in the Tender shall be kept open for acceptance for a minimum period of **SIX MONTHS** from latest due date of offer submission (including extension, if any). In case BHEL (Bharat Heavy Electricals Ltd) calls for negotiations, such negotiations shall not amount to cancellation or withdrawal of the original offer which shall be binding on the tenderers.

1.14 EXECUTION OF CONTRACT AGREEMENT

The successful tenderer's responsibility under this contract commences from the date of issue of the Letter of Award by Bharat Heavy Electricals Limited.

The successful tenderer shall be required to execute an agreement in the prescribed form, with BHEL, within a reasonable time after the acceptance of the Letter of Award, and in any case before releasing the first running bill. The contract agreement shall be signed by a person duly authorized/empowered by the tenderer. The expenses for preparation of agreement document shall be borne by BHEL.

1.15 REJECTION OF TENDER AND OTHER CONDITIONS

- 1.15.1 The acceptance of tender will rest with BHEL which does not bind itself to accept the lowest tender nor any tender and reserves to itself full rights for the following without assigning any reasons whatsoever: -
 - a) To reject any or all of the tenders.
 - b) To split up the work amongst two or more tenderers as per NIT.
 - c) To award the work in part if specified in NIT.
 - d) In case of either of the contingencies stated in (b) and (c) above, the time for completion as stipulated in the tender shall be applicable.
- 1.15.2 Conditional tenders, unsolicited tenders, tenders which are incomplete or not in the form specified or defective or have been materially altered or not in accordance with the tender conditions, specifications etc. are liable to be rejected.
- 1.15.3 Tenders are liable to be rejected in case of unsatisfactory performance of the tenderer with BHEL or tenderer under suspension (debarred) by any unit / region / division of BHEL or tenderers who do not comply with the latest guidelines of Ministry/Commissions of Govt of India. BHEL reserves the right to not consider a bidder for further processing of tender in case it is observed that they are overloaded and may not be in a position to execute this job as per

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the required schedule in line with clause no. 9.0 of the 'NIT'. The decision of BHEL will be final in this regard.

- 1.15.4 If a tenderer who is a proprietor expires after the submission of his tender or after the acceptance of his tender, BHEL may at their discretion, cancel such tender. If a partner of a firm expires after the submission of tender or after the acceptance of the tender, BHEL may then cancel such tender at their discretion, unless the firm retains its character. In case BHEL resolves to cancel the tender under this clause, BHEL will issue a notice in this regard containing reasons as to the cancellation of tender. The contractor shall be required to furnish his response to such notice within a period of 14 days from the date of receipt of such notice through any means (BHEL reserves the right to decrease the period up to 05 days). BHEL after due consideration of the representation made by contractor shall communicate its final decision within a reasonable period.

In case contractor fails to submit any response to the notice issued by BHEL within the period stipulated in the notice, BHEL at its discretion may proceed to cancel the contract.

Contractor shall not be eligible for any compensation whatsoever for the cancellation of contract under this clause

- 1.15.5 BHEL will not be bound by any Power of Attorney granted by changes in the composition of the firm made subsequent to the execution of the contract. BHEL may, however, recognize such power of Attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contractor concerned.
- 1.15.6 If the tenderer deliberately gives wrong information in his tender, BHEL reserves the right to reject such tender at any stage or to cancel the contract if awarded and forfeit the Earnest Money/Security Deposit/any other money due.
- 1.15.7 Canvassing in any form in connection with the tenders submitted by the Tenderer shall make his offer liable to rejection.
- 1.15.8 In case the Proprietor, Partner or Director of the Company/Firm submitting the Tender, has any relative or relation employed in BHEL, the authority inviting the Tender shall be informed of the fact as per specified format, along with the Offer.

1.16 INTIMATION OF CHANGE OF NAME/ RECONSTRUCTION OF THE ORGANIZATION:

In the event of the organization (Proprietorship/Partnership/Company) undergoing any change of name or reconstitution, prior intimation of the same shall be given to BHEL. Upon such changes coming into effect, the same is to be intimated to BHEL immediately with supporting documents as applicable.

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CHAPTER-2

2.1 DEFINITION:

The following terms shall have the meaning hereby assigned to them except where the context otherwise requires.

- i) BHEL shall mean Bharat Heavy Electricals Limited, a company registered under Indian Companies Act 1956, having its Registered Office at BHEL HOUSE, SIRI FORT, NEW DELHI – 110 049, and its office at HPVP, Visakhapatnam-530012 (inviting tenders) or its Authorized Officers.
- ii) “**EXECUTIVE DIRECTOR**” or “**GENERAL MANAGER (In- charge)**” or “**GENERAL MANAGER**” shall mean the Officer in Administrative charge of the respective UNIT/Power Sector Region.
- iii) “**COMPETENT AUTHORITY**” shall mean BHEL Officers who are empowered to act on behalf of BHEL
- iv) “**ENGINEER**” or “**ENGINEER IN CHARGE**” shall mean an Officer of BHEL as may be duly appointed and authorized by BHEL to act as “Engineer” on his behalf for the purpose of the Contract, to perform the duty set forth in this General Conditions of Contract and other Contract documents. The term also includes ‘**CONSTRUCTION MANAGER**’ or ‘**SITE IN CHARGE**’ as well as Officers at Site or at the Headquarters of the respective Power Sector Regions. For the purpose of joint measurement, verification, certification and/ or approval of the work and/ or documents under the contract the word “Engineer” or “Engineer In charge” shall be deemed to include the Engineers of the Customer and/ or his Consultant also.
- v) “**SITE**” shall mean the places or place at which the plants/ equipment are to be erected and services are to be performed as per the specification of this Tender.
- vi) “**CLIENT OF BHEL**” or “**CUSTOMER**” shall mean the project authorities with whom BHEL has entered into a contract for supply of equipment or provision of services.
- vii) “**CONTRACTOR**” shall mean the successful Bidder/Tenderer who is awarded the Contract and shall include the Contractor’s successors, heirs, executors, administrators and permitted assigns.
- viii) “**CONTRACT**” or “**CONTRACT DOCUMENT**” shall mean and includes the Agreement or Work Order, the accepted appendices of Rates, Schedules, Quantities if any, Offer submitted by contractor including acceptance to General Conditions of Contract, Special.

Conditions of Contract, Instructions to the Tenderers, Drawings, Technical Specifications, the Special Specifications if any, the Tender documents, subsequent amendments /corrigendum to Tender mutually agreed upon and the Letter of Intent/ Award/ Acceptance issued by BHEL. Any conditions or terms stipulated by the contractor in the tender documents or subsequent letters shall not form part of the contract unless, specifically accepted in writing by BHEL in the Letter of Intent/Award and incorporated in the agreement or amendment thereof.

- ix) “**GENERAL CONDITIONS OF CONTRACT**” shall mean the ‘**Instructions to Tenderers**’ and ‘**General Conditions of Contract**’ pertaining to the work for which above tenders have been called for.
- x) “**TENDER SPECIFICATION**” or “**TENDER**” or “**TENDER DOCUMENTS**” shall mean General Conditions, Common Conditions, Special Conditions, Price Bid, Rate Schedule, Technical Specifications, Appendices, Annexures, Corrigendum, Amendments, Forms, Procedures, Site information etc. and drawings/documents pertaining to the work for which the tenderers are required to submit their offers. Individual specification number will be assigned to each Tender Specification.
- xi) “**LETTER OF INTENT/ AWARD**” shall mean the intimation by a Letter/Fax/email to the tenderer that the tender has been accepted in accordance with provisions contained in the letter. The responsibility of the contractor commences from the date of issue of this letter and all terms and conditions of the contract are applicable from this date.
- xii) “**COMPLETION TIME**” shall mean the period by ‘date/month’ specified in the ‘Letter of Intent/Award’ or date mutually agreed upon for handing over of the intended scope of work, the erected

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equipment/plant which are found acceptable by the Engineer, being of required standard and conforming to the specifications of the Contract.

- xiii) **“PLANT”** shall mean and connote the entire assembly of the plant and equipment covered by the contract.
- xiv) **“EQUIPMENT”** shall mean equipment, machineries, materials, structural, electricals and other components of the plant covered by the contract.
- xv) **“TESTS”** shall mean and include such test or tests to be carried out on the part of the contractor as are prescribed in the contract or considered necessary by BHEL in order to ascertain the quality, workmanship, performance and efficiency of the contractor or part thereof.
- xvi) **“APPROVED”, “DIRECTED” or “INSTRUCTED”** shall mean approved, directed or instructed by BHEL.
- xvii) **“WORK or CONTRACT WORK”** shall mean and include supply of all categories of labour, specified consumables, tools and tackles and Plants required for complete and satisfactory site transportation, handling, stacking, storing, erecting, testing and commissioning of the equipment to the entire satisfaction of BHEL.
- xviii) **“SINGULAR AND PLURALS ETC”** words carrying singular number shall also include plural and vice versa, where the context so requires. Words imparting the masculine Gender shall be taken to include the feminine Gender and words imparting persons shall include any Company or Associations or Body of Individuals, whether incorporated or not.
- xix) **“HEADING”** – The heading in these General Conditions are solely for the purpose of facilitating reference and shall not be deemed to be part thereof or be taken as instructions thereof or of the contract.
- xx) **“MONTH”** shall mean calendar month unless otherwise specified in the Tender.
- xxi) **‘Day’ or ‘Days’** unless herein otherwise expressly defined shall mean calendar day or days of twenty-four (24) hours each. A Week shall mean continuous period of seven (7) days.
- xxii) **“COMMISSIONING”** shall mean the synchronization testing and achieving functional operation of the Equipment with associated system after all initial adjustments, trials, cleaning, re-assembly required at site if any, have been completed and Equipment with associated system is ready for taking into service.
- xxiii) **“WRITING”** shall include any manuscript type written or hand written or printed statement or electronically transmitted messages, under the signature or seal or transmittal of BHEL.
- xxiv) **“TEMPORARY WORK”** shall mean all temporary works for every kind required in or for the execution, completion, maintenance of the work.
- xxv) **‘CONTRACT PRICE’ or ‘CONTRACT VALUE’** shall mean the sum mentioned in the LOI/ LOA/ Contract Agreement subject to such additions thereto or deductions there from as may be made under provisions hereinafter contained.
- xxvi) **‘EXECUTED CONTRACT VALUE’** shall mean actual value of works executed by the contractor and certified by BHEL. This value shall not include PVC, ORC, Extra Works and Taxes.
- xxvii) **“COMMENCEMENT DATE” or “START DATE”** shall mean the commencement/start of work at Site as per terms defined in the Tender.
- xxviii) **“SHORT CLOSING” or “FORE CLOSING”** of Contract shall mean the premature closing of Contract, for reasons not attributable to the contractor and mutually agreed between BHEL and the contractor.
- xxix) **“TERMINATION”** of Contract shall mean the pre-mature closing of contract due to reasons as mentioned in the contract.
- xxx) **“DE MOBILIZATION”** shall mean the temporary winding up of Site establishment by Contractor leading to suspension of works temporarily for reasons not attributable to the contractor.

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xxxi) “**RE MOBILIZATION**” shall mean the resumption of work with all resources required for the work after demobilization.

xxxii) “**OVERRUN CHARGES (ORC)**” shall mean and include all the costs incurred by the Contractor during the extended period of the contract, including but not limited to any cost arising out of idle labour, administrative cost, T & P and machinery.

2.2 LAW GOVERNING THE CONTRACT AND COURT JURISDICTION

The contract shall be governed by the Laws of India. Subject to clause 2.21.1.1 of this contract, the Civil Court having original Civil Jurisdiction at(e.g. **Delhi for PSNR/ Kolkata for PSER/ Nagpur for PSWR/ Chennai for PSSR**, shall alone have exclusive jurisdiction in regard to all matters in respect of the Contract.

2.3 ISSUE OF NOTICE

2.3.1 Service of notice to the Contractor

Any notice to be given to the Contractor under the terms of the contract shall be served by sending the same by **Email/ Registered Post/Speed Post to or leaving the same at** the Contractor’s last known address of the principal place of business (or in the event of the contractor being a company, to or at its Registered Office). In case of change of address, the notice shall be served at changed address as notified in writing by the Contractor to BHEL. Such dispatch or display ~~posting or leaving~~ of the notice as the case may be shall be deemed to be good service of such notice and the time mentioned to the condition for doing any act after notice shall be reckoned from the date so mentioned in such notice.

2.3.2 Service of notice to on BHEL

Any notice to be given to BHEL In-charge of the Region under the terms of the Contract shall be served by sending the same by Registered/AD or Speed post to BHEL address or changed address as notified in writing by BHEL to the Contractor.

2.4 USE OF LAND

No land belonging to BHEL or their Customer under temporary possession of BHEL shall be occupied by the contractor without written permission of BHEL.

2.5 COMMENCEMENT OF WORK

2.5.1 The contractor shall commence the work as per the time indicated in the Letter of Intent/Award from BHEL and shall proceed with the same with due expedition without delay.

2.5.2 If the contractor fails to start the work within stipulated time as per LOI/ LOA or as intimated by BHEL, then BHEL at its sole discretion shall have the right to cancel the contract. The Earnest Money and/or Security Deposit furnished by the contractor to under this tender will stand forfeited without any further reference to him and without prejudice to BHEL’s other rights and remedies under this contract and the applicable laws in this regard.

2.5.3 All the work shall be carried out under the direction and to the satisfaction of BHEL.

2.6 MEASUREMENT OF WORK AND MODE OF PAYMENT:

2.6.1 All payments due to the contractors shall be made by e mode only, unless otherwise found operationally difficult for reasons to be recorded in writing and approved by contract executing department.

2.6.2 For progress running bill payments: - The Contractor shall present detailed measurement sheets in triplicate, duly indicating all relevant details based on technical documents and connected drawings for work done during the month/period under various categories in line with terms of payment as per contract. The basis of arriving at the quantities, weights shall be relevant documents and drawings released by BHEL. These measurement sheets shall be prepared jointly with BHEL Engineers and signed by both the parties.

2.6.3 These measurement sheets will be checked by BHEL Engineer and quantities and percentage eligible for payment under various groups shall be decided by BHEL Engineer. The abstract of

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quantities and percentage so arrived at based on the terms of payment shall be entered in Measurement Book and signed by both the parties.

2.6.4 Based on the above quantities, contractor shall prepare the bills, along with statutory documents, in prescribed format and work out the financial value. These will be entered in Measurement Book and signed by both the parties. Payment shall be made by BHEL after effecting the recoveries due from the contractor.

2.6.5 All recoveries due from the contractor for the month/period shall be effected in full from the corresponding running bills unless specific approval from the competent authorities is obtained to the contrary.

2.6.6 Measurement shall be restricted to that portion of work for which it is required to ascertain the financial liability of BHEL under this contract.

2.6.7 The measurement shall be taken jointly by persons authorized on the part of BHEL and by the Contractor.

2.6.8 The Contractor shall bear the expenditure involved if any, in making the measurements and testing of materials to be used/ used in the work. The contractor shall, without extra charges, provide all the assistance with appliances and other things necessary for measurement.

2.6.9 If at any time due to any reason whatsoever, it becomes necessary to re-measure the work done in full or in part, the expenses towards such re measurements shall be borne by the contractor unless such re measurements are warranted solely for reasons not attributable to contractor.

2.6.10 Passing of bills covered by such measurements does not amount to acceptance of the completion of the work measured. Any left out work has to be completed, if pointed out at a later date by BHEL.

Final measurement bill shall be prepared in the final bill format prescribed for the purpose based on the certificate issued by BHEL Engineer that entire works as stipulated in tender specification has been completed in all respects to the entire satisfaction of BHEL. The Contractor shall submit the final bill in line with WAM 7 format as per tender documents with an additional recording of the dispute, if any and shall sign with the following declaration:

I/ We hereby certify that I/We have performed the work as per the terms and conditions of Contract Agreement/Work Order No.....dated.....for which payment is claimed as above and that I/We have no further claim under this agreement/work order except for the following (nature of claim with details & amount claimed, if any. NIL may be mentioned if there are no further claims). –*

a).....

b).....

c)

It is agreed that the authorized signatory of Contractor shall necessarily record his claims/ dispute in Form WAM 7 only and any claim(s)/ dispute in any other form/ letter shall not be taken cognizance of by BHEL and admissible before any forum. BHEL shall make the payment of undisputed amount within the stipulated time without any unreasonable delay.

All the tools and tackles loaned to him should be returned in satisfactory condition to BHEL. The abstract of final quantities and financial values shall also be entered in the Measurement Books and signed by both parties to the contract. The Final Bill shall be prepared and paid within a reasonable time after completion of work.

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2.7 RIGHTS OF BHEL

BHEL reserves the following rights in respect of this contract during the original contract period or its extensions if any, as per the provisions of the contract, without entitling the contractor for any compensation.

2.7.1 To withdraw any portion of work and/or to restrict/alter quantum of work as indicated in the contract during the progress of work and get it done through other agencies to fulfil BHEL's commitment to its customer or the date of completion is advance due to other emergent reasons/ BHEL's obligation to its customer.

Where the contractor fails to deploy adequate manpower to meet the contractual target, BHEL reserves the right to deploy manpower to meet such shortfall, through any other agency for expediting activities in the interest of the project. Supplied manpower shall be put on job by the contractor. Fulfilling of all obligations towards payments and other statutory compliances related to such manpower shall be the contractor's responsibility. In case of contractor's failure to fulfil his obligations in respect of such manpower, BHEL shall be entitled to take action as provided herein.

2.7.2 BREACH OF CONTRACT, REMEDIES AND TERMINATION:

2.7.2.1 The following shall amount to breach of contract:

- I. Non-supply of material/ non-completion of work by the Supplier/Vendor within scheduled delivery/ completion period as per contract or as extended from time to time.
- II. The Supplier/Vendor fails to perform as per the activity schedule and there are sufficient reasons even before expiry of the delivery/ completion period to justify that supplies shall be inordinately delayed beyond contractual delivery/ completion period.
- III. The Supplier/Vendor delivers equipment/ material not of the contracted quality.
- IV. The Supplier/Vendor fails to replace the defective equipment/ material/ component as per guarantee clause.
- V. Withdrawal from or abandonment of the work by the Supplier/Vendor before completion as per contract.
- VI. Assignment, transfer, subletting of Contract by the Supplier/Vendor without BHEL's written permission resulting in termination of Contract or part thereof by BHEL.
- VII. Non-compliance to any contractual condition or any other default attributable to Supplier/Vendor.
- VIII. Any other reason(s) attributable to Vendor towards failure of performance of contract. In case of breach of contract, BHEL shall have the right to terminate the Purchase Order/ Contract either in whole or in part thereof without any compensation to the Supplier/Vendor.
Any of the declarations furnished by the contractor at the time of bidding and/ or entering into the contract for supply are found untruthful and such declarations were of a nature that could have resulted in non-award of contract to the contractor or could expose BHEL and/ or Owner to adverse consequences, financial or otherwise.
- IX. Supplier/Vendor is convicted of any offence involving corrupt business practices, antinational activities or any such offence that compromises the business ethics of BHEL, in violation of the Integrity Pact entered into with BHEL has the potential to harm the overall business of BHEL/ Owner.

Note-Once BHEL considers that a breach of contract has occurred on the part of Supplier/Vendor, BHEL shall notify the Supplier/Vendor by way of notice in this regard. Contractor shall be given an opportunity to rectify the reasons causing the breach of contract within a period of 14 days.

In case the contractor fails to remedy the breach, as mentioned in the notice, to the satisfaction of BHEL, BHEL shall have the right to take recourse to any of the remedial actions available to it under the relevant provisions of contract.

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LD against delay in executed work in case of Termination of Contract:

LD against delay in executed work shall be calculated in line with LD clause no. 2.7.9 of GCC, for the delay attributable to contractor. For limiting the maximum value of LD, contract value shall be taken as Executed Value of work till termination of contract.

Method for calculation of “LD against delay in executed work in case of termination of contract” is given below.

- i) Let the time period from scheduled date of start of work till termination of contract excluding the period of Hold (if any) not attributable to contractor = T1
- ii) Let the value of executed work till the time of termination of contract = X
- iii) Let the Total Executable Value of work for which inputs/fronts were made available to contractor and were planned for execution till termination of contract = Y
- iv) Delay in executed work attributable to contractor i.e. $T2 = [1 - (X/Y)] \times T1$
- v) LD shall be calculated in line with LD clause (clause 2.7.9) of the Contract for the delay attributable to contractor taking “X” as Contract Value and “T2” as period of delay attributable to contractor.

2.7.2.2 REMEDIES IN CASE OF BREACH OF CONTRACT.

- i) Wherein the period as stipulated in the notice issued under clause 14.1 has expired and Contractor has failed to remedy the breach, BHEL will have the right to terminate the contract on the ground of "Breach of Contract" without any further notice to contractor.
- ii) Upon termination of contract, BHEL shall be entitled to recover an amount equivalent to 10% of the Contract Value for the damages on account of breach of contract committed by the Contractor. This amount shall be recovered by way of encashing the security instruments like performance bank guarantee etc available with BHEL against the said contract. In case the value of the security instruments available is less than 10% of the contract value, the balance amount shall be recovered from other financial remedies (i.e. available bills of the contractor, retention amount, from the money due to the Contractor etc. with BHEL) or the other legal remedies shall be pursued.
- iii) wherever the value of security instruments like performance bank guarantee available with BHEL against the said contract is 10% of the contract value or more, such security instruments to the extent of 10% contract value will be encashed. In case no security instruments are available or the value of the security instruments available is less than 10% of the contract value, the 10% of the contract value or the balance amount, as the case may be, will be recovered in all or any of the following manners:
- iv) In case the amount recovered under sub clause (a) above is not sufficient to fulfil the amount recoverable then; a demand notice to deposit the balance amount within 30 days shall be issued to Contractor.
- v) If Contractor fails to deposit the balance amount within the period as prescribed in demand notice, following action shall be taken for recovery of the balance amount:
 - a from dues available in the form of Bills payable to defaulted Contractor against the same contract.
 - b If it is not possible to recover the dues available from the same contract or dues are insufficient to meet the recoverable amount, balance amount shall be recovered from any money(s) payable to Contractor under any contract with other Units of BHEL including recovery from security deposits or any other deposit available in the form of security instruments of any kind against Security deposit or EMD.

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- c In-case recoveries are not possible with any of the above available options, Legal action shall be initiated for recovery against defaulted Contractor.
- vi) It is an agreed term of contract that this amount shall be a genuine pre-estimate of damages that BHEL would incur in completion of balance contractual obligation of the contract through any other agency and BHEL will not be required to furnish any other evidence to the Contractor for the purpose of estimation of damages.
- vii) In addition to the above, imposition of liquidated damages, debarment, termination, descoping, short-closure, etc., shall be applied as per provisions of the contract.

Note: The defaulting contractor shall not be eligible for participation in any of the future enquiries floated by BHEL to complete the balance work. The defaulting contractor shall mean and include:

- (a) In case defaulted contractor is the Sole Proprietorship Firm, any Sole Proprietorship Firm owned by same Sole Proprietor.
- (b) In case defaulted contractor is The Partnership Firm, any firm comprising of same partners/ some of the same partners (but not including any new partner); or sole proprietorship firm owned by any partner(s) as a sole proprietor.

In case Contractor fails to deploy the resources as per requirement informed by BHEL in writing to expedite the work, BHEL can deploy own/hired/otherwise arranged resources and recover the expenses incurred from the dues payable to contractor. Recoveries shall be actual expenses incurred plus 5% overheads or as defined in TCC.

2.7.4 To terminate the contract or to restrict the quantum of work and pay for the portion of work executed in case BHEL's contract with their customer are terminated for any reason, whatsoever.

2.7.5 Whenever any Claim or Claims for payment of any sum of money(s) arises under this or any other contract against the contractor, BHEL shall be entitled to withhold and also have a lien to retain such sum of money(s) in whole or in part from any money(s) payable to contractor and/or security deposits furnished or deducted in cash from the bills of contractor, (if any) under this contract. In the event of the securities or the amounts payable to Contractor, being insufficient to cover BHEL claims, then BHEL shall be entitled to withhold and have a lien to the extent of such claims from any sum or sums found payable or which at any time thereafter may become payable to the contractor under this or any other contract with BHEL.

- a) Claim or Claims for payment of any sum of money(s) arising from the Contractor under this or any other contract against the contractor, shall mean, the sum of money(s) actually incurred by BHEL in fulfilling the contractual responsibilities of contractor under the contract, to which he has failed to fulfil plus applicable overheads (@ 5%) along with interest as applicable under the Contract on total amount (i.e. money actually incurred plus overheads)
- b) It is an agreed term of the contract that, the sum or sums of money so withheld or retained under the lien by BHEL will be kept withheld or retained as such by BHEL till the claims arising out of this or any other contract are finally adjudicated wither through Arbitration or a Court of competent jurisdiction as the case may be in accordance with the terms of contract. Intimation given by the BHEL Engineer regarding withholding of such money(s) shall be considered as sufficient and relevant date for all purposes. No Interest shall be payable on such sum(s) of money which becomes due or as the case may be adjudged to be due from BHEL to Contractor, whether under contract or otherwise.
- c) Where the contractor is a partnership firm, BHEL shall be entitled to withhold and also have a lien to retain towards such claims in whole or in part, from any other money(s) payable to any partner, whether in his individual capacity or otherwise.

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- d) If any money(s) shall, as a result of any claim or application made under the relevant provisions of any Labour Welfare Act and/ or Rules, including but not limited to Contract Labour Regulation & Abolition Act, Minimum Wages Act, Payment of Gratuity Act, BOCW (RE&CS) Act, Provident Fund Act, Employee State Insurance Act, be directed to be paid by the BHEL, such money shall be deemed to be moneys payable to the BHEL by the Contractor.
- e) Where the Contractor fails to repay to BHEL such moneys along with applicable overheads (@ 5%) and interest, as aforesaid within seven days of being demanded, BHEL shall be entitled to recover the same from Contractor's bills/ Security Deposit or any other money(s) payable to Contractor under this Contract or any other Contract with BHEL.

2.7.6 While every endeavour will be made by BHEL to this end, yet BHEL cannot guarantee uninterrupted work due to conditions beyond its control. The Contractor will not be normally entitled for any compensation/extra payment on this account unless otherwise specified elsewhere in the contract.

2.7.7 BHEL may permit or direct contractor to demobilize and remobilize at a future date as intimated by BHEL in case of following situations for reasons other than Force majeure conditions and not attributable to contractor:

- i) suspension of work(s) at a Project either by BHEL or Customer,
or
- ii) where work comes to a complete halt or reaches a stage wherein worthwhile works cannot be executed and there is no possibility of commencement of work for a period of not less than three months

In such cases, charges towards demobilization and remobilization shall be as decided by BHEL after successful remobilization by contractor at site, and decision of BHEL shall be final and binding on the contractor. After remobilization, all conditions as per contract shall become applicable. In case Contractor does not remobilize with adequate resources or does not start the work within the period as intimated, then BHEL reserves the right to terminate the contract and effect remedies under Clause 2.7.2.2. In case of any conflict, BHEL decision in this regard shall be final and binding on the contractor.

2.7.8 In the unforeseen event of inordinate delay in receipt of materials, drawings, fronts etc. due to which inordinate discontinuity of work is anticipated, BHEL on its own or contractor's request at its discretion may consider to short close the contract in any of the following cases:

- a) The balance works (including but not limited to Trial Operation, PG Test etc.) are minor vis a vis the scope of work envisaged as per the contract.
- b) There has been no significant work in past 6 months OR no significant work is expected in next 6 months (example in Hydro projects or in projects where work has stopped due to reasons beyond the control of BHEL).
- c) The balance works cannot be done within a reasonable period of time as they are dependent on unit shut down or on other facilities of customer or any other such reasons not attributable to the contractor.

At the point of requesting for short closure, contractor shall establish that he has completed all works possible of completion and he is not able to proceed with the balance works due to constraints beyond his control. In such a case, the estimated value of the unexecuted portion of work (or estimated value of services to be provided for carrying out milestone/stage payments like Trial Operation/PG Test etc.) as decided by BHEL, shall however be reduced from the final contract value.

Note: The Contractor shall not be eligible for any compensation on account of Quantity Variation arising out of short-closure of contract as per clause no. 2.7.8 (b) above.

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2.7.9 LIQUIDATED DAMAGES

Liquidated Damages, wherever referred under this Tender/Agreement, shall mean and refer to the damages, not in the nature of penalty, which the contractor agrees to pay in the event of delay in delivery of stores, installation, commissioning, breach of contract etc. as the case may be.

Liquidated Damages leviable upon the contractor is a sum which is agreed by the parties as a reasonable and genuine pre-estimate of damages which will be suffered by BHEL on account of delay/breach on the part of the contractor.

Liquidated Damages shall be calculated in the manner stipulated hereinafter:

In case the work is not completed within the stipulated time period, BHEL at its discretion may grant provisional time extension to contractor for the sole purpose of completion of balance works keeping its right reserved under the contract and law.

Grant of any provisional time extension shall by no means be considered as waiver of BHEL rights under the contract or law.

After the completion of work, duly certified by Engineer in charge, a comprehensive delay analysis shall be carried out to ascertain the attribution of delays in the provisional time extensions granted to contractor. The delay analysis shall record:

- a) Delays solely attributable to contractor
- b) Delays attributable to BHEL
- c) Delays on account of Force Majeure (as specified elsewhere in the contract)

The total period under the final time extension shall be equal to the period between the scheduled date of completion and the actual date of completion of contract. LD shall be imposed/ levied for the portion of time

extensions solely attributable to contractor and recoverable from the dues payable to the contractor.

For the periods, wherein the delay as per the comprehensive delay analysis carried out is solely attributable to contractor, BHEL shall have the right to impose Liquidated Damage at the rate of 0.5% of the contract value, per week of delay or part thereof subject to a maximum of 10% of the contract value.

Contract Value for this purpose, shall be the final executed value exclusive of ORC, Extra Works executed on Man-day rate basis, Supplementary/ Additional Items and PVC. Before levying LD, the contractor shall be duly intimated the amount and reasons thereof for imposition of LD.

2.8 RESPONSIBILITIES OF THE CONTRACTOR IN RESPECT OF LOCAL LAWS, EMPLOYMENT OF WORKERS ETC.

The following are the responsibilities of the contractor in respect of observance of local laws, employment of personnel, payment of taxes etc. The subcontractor shall fully indemnify BHEL against any claims of whatsoever nature arising due to the failure of the contractor in discharging any of his responsibilities hereunder:

- 2.8.1** As far as possible, Unskilled Workers shall be engaged from the local areas in which the work is being executed.
- 2.8.2** The contractor at all times during the continuance of this contract shall, in all his dealings with local labour for the time being employed on or in connection with the work, have due regard to all local festivals and religious and other customs.
- 2.8.3** The contractor shall comply with all applicable State and Central Laws, Statutory Rules, Regulations, Notifications etc. such as Payment of Wages Act, Minimum Wages Act, Workmen Compensation Act, Employer's Liability Act, Industrial Disputes Act, Employers Provident Fund and Miscellaneous Provisions Act, 1952, Employees State Insurance Scheme, Contract Labour (Regulation and Abolition) Act, 1970, Payment of Bonus & Gratuity Act, Building and Other

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Construction Workers (Regulation of Employment and Conditions of Service) Act 1996, The Building and Other Construction Workers' Welfare Cess Act 1996 and other Acts, Rules, and Regulations for labour/workers as applicable and as may be enacted by the State Government and Central Govt. during the tenure of the Contract and having force or jurisdiction at Site. The Contractor shall also comply with provisions of and give all such notices to the local Governing Body, Police and other relevant Authorities as may be required by the Law. The Contractor shall without any fail maintain all the registers/records in proper formats as per all the Acts, Rules and Regulations mentioned in this clause 2.8.3.

- 2.8.4** The Contractor shall obtain independent License under the Contract Labour (Regulations and Abolition) Act, 1970 for engaging contract labour as required from the concerned Authorities based on the certificate (Form- V or as applicable) issued by the Principal Employer/Customer.
- 2.8.5** The contractor shall pay and bear all taxes, fees, license charges, Cess, duties, deposits, tolls, royalties, commission or other charges which may be leviable on account of his operations in executing the contract.
- 2.8.6** While BHEL would pay the inspection fees and Registration fees of Boiler/Electrical Inspectorate, all other arrangements for site visits periodically by the Inspectorate to site, Inspection certificate etc. will have to be made by contractor. However, BHEL will not make any payment to the Inspectorate in connection with contractor's Welders/Electricians qualification tests etc.
- 2.8.7** Contractor shall be responsible for provision of Health and Sanitary arrangements (more particularly described in Contract Labour Regulation & Abolition Act), Safety precautions etc. as may be required for safe and satisfactory execution of contract.
- 2.8.8** The contractor shall be responsible for proper accommodation including adequate medical facilities for personnel employed by him.
- 2.8.9** The contractor shall be responsible for the proper behaviour and observance of all regulations by the staff employed by him.
- 2.8.10** The contractor shall ensure that no damage is caused to any person/property of other parties working at site/company" premises. If any such damage is caused, it is responsibility of the contractor to make good the losses or compensate for the same.
- 2.8.11** All the properties/equipment/components of BHEL/their Client/Customer loaned with or without deposit to the contractor in connection with the contract shall remain properties of BHEL/their Client/Customer.
- 2.8.12** The contractor shall use such properties for the purpose of execution of this contract. All such properties/equipment/components shall be deemed to be in good condition when received by the contractor unless he notifies within 48 hours to the contrary. The contractor shall return them in good condition as and when required by BHEL/their Client. In case of non-return, loss, damage, repairs etc. the cost thereof as may be fixed by BHEL Engineer will be recovered from the contractor.
- 2.8.13** In case the contractor is required to undertake any work outside the scope of this contract, the rates payable shall be those mutually agreed upon if the item rates are not mentioned in existing contract.
- 2.8.14** Any delay in completion of works/or non-achievement of periodical targets/or non execution of contract due to the reasons attributable to the contractor, the same may have to be compensated by the contractor either by increasing manpower and resources or by working extra hours and/or by working more than one shift. All these are to be carried out by the contractor at no extra cost.
- 2.8.15** The contractor shall arrange, coordinate his work in such a manner as to cause no hindrance to other agencies working in the same premises.
- 2.8.16** All safety rules and codes applied by the Customer /BHEL at site shall be observed by the contractor without exception. The contractor shall be responsible for the safety of the

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equipment/material and works to be performed by him and shall maintain all light, fencing guards, slings etc. or other protection necessary for the purpose. Contractor shall also take such additional precautions as may be indicated from time to time by the Engineer with a view to prevent pilferage, accidents, fire hazards. Due precautions shall be taken against fire hazards and atmospheric conditions. Suitable number of Clerical staff, watch and ward, store keepers to take care of equipment/materials and construction tools and tackles shall be posted at site by the contractor till the completion of work under this contract.

The contractor shall arrange for such safety devices as are necessary for such type of work and carry out the requisite site tests of handling equipment, lifting tools, tackles etc. as per prescribed standards and practices.

Contractor has to ensure the implementation of Health, Safety and Environment (HSE) requirements as per directions given by BHEL/Customer. The contractor has to assist in HSE audit by BHEL/Customer and submit compliance Report. The contractor has to generate and submit record/reports as per HSE plan/activities as per instruction of BHEL/Customer.

- 2.8.17** The contractor shall be directly responsible for payment of wages to his workmen/labours before the expiry of seven days from the last day of wage period and to ensure disbursement of wages in the presence of the representative from BHEL. A pay roll sheet giving all the payments given to the workers and duly signed by the contractor's representative should be furnished to BHEL site for the purpose of maintaining the records for compliance, Contractor shall create awareness amongst their workforce by helping & encouraging in opening bank accounts and to encourage them to adopt digital mode of transactions. While releasing wages/ salary to their workers/ supervisors/ staff, Contractor shall comply with the GOI's guidelines for maximizing such transactions through Non-Cash / digital means.
- 2.8.18** In case of any class of work for which there is no such specification as laid down in the contract, such work shall be carried out in accordance with the instructions and requirements of the Engineer.
- 2.8.19** Also, no idle charges will be admissible in the event of any stoppage caused in the work resulting in contractor's labour and Tools & Plants being rendered idle due to any reason at any time.
- 2.8.20** The contractor shall take all reasonable care to protect the materials and work till such time the plant/equipment has been taken over by BHEL or their Customer whichever is earlier.
- 2.8.21** The contractor shall not stop the work or abandon the site for whatsoever reason of dispute, excepting force majeure conditions. All such problems/disputes shall be separately discussed and settled without affecting the progress of work. Such stoppage or abandonment shall be treated as breach of contract and dealt with accordingly.
- 2.8.22** The contractor shall keep the area of work clean and shall remove the debris etc. while executing day-to-day work. Upon completion of work, the contractor shall remove from the vicinity of work, all scrap, packing materials, rubbish, unused and other materials and deposit them in places specified by the Engineer. The contractor will also demolish all the hutments, sheds, offices etc. constructed and used by him and shall clean the debris. In the event of his failure to do so, the same will be arranged to be done by the Engineer and the expenses recovered from the contractor.
- 2.8.23** The contractor shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and timely execution shall be the essence of this contract. The contractor shall be responsible to ensure that the quality, assembly and workmanship conform to the dimensions and clearance given in the drawings and/ or as per the instructions of the Engineer.
- 2.8.24** The Contractor to note that some of BHEL's T&Ps/MMDs may not be insured. The Contractor will take necessary precautions and due care to protect the same while in his custody from any damage/ loss till the same is handed over back to BHEL. In case the damage / loss is caused

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due to carelessness/ negligence on the part of the contractor, the Contractor is liable to get them repair/ replaced immediately and in case of his failure to do so within a reasonable time, BHEL shall have to recover the loss from the contractor.

2.8.25 For all works having contract value of Rs. 5,00,000/- or above, BHEL shall recover the amount of compensation paid to victim(s) by BHEL towards loss of life/ permanent disability due to an accident which is attributable to the negligence of contractor, agency or firm or any of its employees as detailed below.

- a) Victim: Any person who suffers permanent disablement or dies in an accident as defined below.
- b) Accident: Any death or permanent disability resulting solely and directly from any unintended and unforeseen injurious occurrence caused during the manufacturing/ operation and works incidental thereto at BHEL factories/ offices and precincts thereof, project execution, erection and commissioning, services, repairs and maintenance, trouble shooting, serving, overhaul, renovation and retrofitting, trial operation, performance guarantee testing undertaken by the company or during any works/ during working at BHEL Units/ Offices/ townships and premises/ Project Sites.
- c) Compensation in respect of each of the victims:
 - i. In the event of death or permanent disability resulting from Loss of both limbs: ₹10,00,000/- (Rupees Ten Lakh).
 - ii. In the event of other permanent disability: ₹.7,00,000/- (Rupees Seven Lakh)
- d) Permanent Disablement: A disablement that is classified as a permanent total disablement under the proviso to section 2 (I) of the Employee's Compensation Act, 1923.

2.8.26 Contractor shall be fully responsible for the safety of their T&Ps and other material mobilized at site. In any case, BHEL shall not be liable for any damage/loss/misuse of any item(s) belong to the contractor.

2.8.27 Contractor will ensure that the work/job is executed through his/her employees on and under no circumstances, the contractor shall subcontract the job without prior written permission from BHEL.

2.8.28 The liability for any compensation on account of injury sustained by an employee of the contractor will be exclusively that of the contractor.

2.9 EXECUTION PLAN, PROGRESS MONITORING, MONTHLY REVIEW AND PERFORMANCE EVALUATION

2.9.1 A tentative plan/ programme for completion of the contractual scope of work as per the time schedule given in the contract shall be made jointly by BHEL and Contractor, before commencement of work. The above programme shall be supported by month wise deployment of resources viz Manpower, T&P, Consumables, etc. Progress will be reviewed periodically (Daily/Weekly/Monthly) vis-à-vis this jointly agreed programme.

Subsequently, every month, quarterly rolling plan will be made by BHEL based on budgeted targets.

Monthly plan in F-14 format shall be drawn from this Quarterly plan. Monthly plan shall necessarily include activities required for achieving targets/ milestones unless inputs/ fronts are not available. While planning and arriving on asking rate all available inputs shall be taken into consideration.

Vendor will be required to execute the monthly plan in that month in addition to make full efforts to minimize the cumulative shortfall attributable to him up to the month.

BHEL may require monthly work plan up to one and half times of average monthly value and demand matching manpower.

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Where, Average Monthly Value = Total Contract Value (as per latest revision) / Period of Contract (in months) Provided, this requirement is reflected in the rolling quarterly plan two months in advance.

If the Contractor refuses to sign the F-14 format, those F-14 formats requiring Contractor's signature shall be deemed to have been signed and accepted by the Contractor, if communicated to the Contractor through email or any other mode as stated in clause 2.3.1.

The Contractor shall submit periodical progress reports (Daily/Weekly/Monthly) and other reports/information including manpower, consumables, T&P mobilization etc. as desired by BHEL.

2.9.2 Monthly progress review between BHEL and Contractor shall be based on the agreed programme as above, availability of inputs/fronts etc., and constraints if any, as per prescribed formats (i.e. Form F-14). Manpower, T&P and consumable reports as per prescribed formats shall be submitted by contractor every month. Release of RA Bills shall be contingent upon certification by BHEL Site Engineer of the availability of the above prescribed formats duly filled in and signed.

2.9.3 The burden of proof that the causes leading to any shortfall is not due to any reasons attributable to the contractor is on the contractor himself. The monthly progress review shall record shortfalls attributable to (i) Contractor, (ii) Force Majeure Conditions, and (iii) BHEL

2.9.4 Performance of the Contractor shall be assessed as per prescribed formats and shall form the basis for 'Assessment of Capacity of Bidder' for Tenders where the Contractor is a bidder. BHEL reserves the right to revise the evaluation formats during the course of execution of the works.

2.10 TIME OF COMPLETION

2.10.1 The time for completion shall be as mentioned in the LOA/Contract. The time for completion shall be reckoned from the date of commencement of work at Site as certified/notified in writing by BHEL Engineers.

2.10.2 Time being the essence of the contract, the entire work shall be completed by the contractor within the time schedule or within such extended periods of time as may be allowed by BHEL under clause 2.11.

2.11 EXTENSION OF TIME FOR COMPLETION

2.11.1 If the completion of work as detailed in the scope of work gets delayed beyond the contract period, the contractor shall request for an extension of the contract and BHEL at its discretion may extend the Contract. If the completion of work gets delayed for reasons not attributable to the contractor, the contract period may be suitably extended at the sole discretion of BHEL.

2.11.2 Based on the F-14 formats, the works balance at the end of original contract period less the backlog attributable to the contractor shall be quantified, and the number of months of 'Time extension' required for completion of the same shall be jointly worked out. Within this period of 'Time extension', the contractor is bound to complete the portion of backlog attributable to the contractor. Any further 'Time extension' or 'Time extensions' at the end of the previous extension shall be worked out similarly.

2.11.3 However, if any 'Time extension' is granted to the contractor to facilitate continuation of work and completion of contract, due to backlog attributable to the contractor alone, then it shall be without prejudice to the rights of BHEL to impose penalty/LD for the delays attributable to the contractor, in addition to any other actions BHEL may wish to take under Clause 2.7.2 of GCC i.e. Breach of Contract, Remedies and Termination.

2.11.4 Planning, progress monitoring, monthly review and performance monitoring shall be carried out as per clause 2.9 of GCC.

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2.12 OVERRUN COMPENSATION –

2.12.1 ORC during original contract period: No ORC shall be applicable during the original contract period.

2.12.2 ORC during extended period for the reasons solely attributable to contractor: No ORC shall be applicable during the extended period granted for the reasons solely attributable to contractor and work executed during this period shall be paid as per original contract rates.

2.12.3 ORC during extended period for the reasons not attributable to contractor: ORC shall be payable as per following procedure:

2.12.3.1 For initial period of twelve months of extended period, ORC rate applicable over executed value shall be 5%. For every subsequent period of twelve months, ORC rate shall be further increased by 5% over the previous rate. For example, ORC rates applicable for initial period of 12 months and subsequent period of 12 months are given below.

Sl. No.	Extended Period for the reasons attributable to BHEL	ORC rate applicable over executed value
1	First 12 months	5%
2	13 th -24 th month and so on	10.25% $\{[(1.05 \times 1.05)-1] \times 100\}$

This process of increasing ORC rate for each subsequent period of 12 months shall continue till applicability of ORC.

2.12.3.2 On completion of original contract period as well as on completion of each subsequent period of twelve months i.e. at the time of change in applicable ORC rate, Delay Analysis shall be carried out and percentage shortfall attributable to both BHEL & Contractor shall be calculated.

2.12.3.3 For the purpose of calculation of ORC, executed value of work in the month shall be divided in Part-1 and Part-2 in proportion of percentage shortfall attributable to BHEL and contractor respectively, based on the last delay analysis as worked out in 2.12.3.2.

ORC shall be payable only on Part-1 and no ORC shall be payable on Part-2.

Value of Part-1 shall be further limited to the value of actual inputs provided by BHEL i.e.

“Plan - Shortfall attributable to BHEL” for the month, as per Form-14 for calculation of ORC.

2.12.3.4 Payment of ORC amount shall be further regulated as follows:

- (i) 50% of the ORC is allocated for deployment of matching resources (with weightages) agreed as per the joint programme drawn vide 2.11.4. ORC Payment against resources shall be calculated in proportion to percentage of resources actually deployed w.r.t. planned resources, as per Form-14.
- (ii) 50% of ORC is allocated for achieving of planned progress agreed as per the joint programme drawn vide 2.11.4. ORC Payment shall be reduced in proportion to percentage shortfall attributable to contractor w.r.t. “Plan - Shortfall attributable to BHEL” for the month, as per Form-14.

2.12.3.5 The maximum amount of ORC payable for the month shall be limited to Rs. 10,00,000/- (Rupees Ten Lakhs).

2.12.3.6 In case, there is no shortfall attributable to contractor for the month and also contractor has deployed the resources as agreed in Form-14 but ORC amount payable for the month worked out as per procedure mentioned in clause 2.12.3.3, 2.12.3.4 and 2.12.3.5, is less than Rs.1,00,000/-, then ORC amount payable for the month shall be Rs.1,00,000/- otherwise ORC amount payable for the month shall be as per procedure mentioned in Clauses clause 2.12.3.3, 2.12.3.4 and 2.12.3.5.

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2.12.3.7 In case execution is on **HOLD** (Other than Force Majeure), ORC shall be payable as per following:

i). Contractor has not been permitted by BHEL to de-mobilize

ORC amount of Rs. 1,00,000/- per month shall be applicable during the period of HOLD

a) provided resources as planned are deployed (not demobilised) during the period of hold.

b) Subsequent to lifting of HOLD, Period of HOLD shall not be excluded in calculation of period for deciding applicable ORC rate as per clause 2.12.3.1. ii). Contractor has been permitted to demobilize and to remobilize after lifting of HOLD

a) No ORC shall be payable to contractor for the period of HOLD.

b) Subsequent to lifting of HOLD, Period of HOLD shall not be excluded in calculation of period for deciding applicable ORC rate as per clause 2.12.3.1.

2.12.3.8 In case **Force Majeure** is invoked:

i). No ORC shall be applicable during the period of Force Majeure.

ii). Subsequent to revocation of Force Majeure, period of Force Majeure shall be excluded in calculation of period for deciding applicable ORC rate as per clause 2.12.3.1.

2.12.4 Applicability of ORC: ORC shall not be applicable for following activities.

i). Area cleaning, removal of temporary structures and return of scrap.

ii). Punch list points / pending points liquidation pending due to reasons attributable to contractor

iii). Submission of "As built Drawing"

iv). Material Reconciliation

v). Completion of Contract Closure formalities like HR Clearance/ No dues from various dept./ Statutory Authorities etc.

2.12.5 Total Over Run Compensation shall be limited to 10% of the cumulatively executed contract value till the month (excluding Taxes and Duties if payable extra). For this purpose, executed contract value excludes PVC, ORC and Extra/Supplementary Works.

2.13 SECURED RECOVERABLE ADVANCES:

2.13.1 INTEREST FREE MOBILIZATION ADVANCE: Competent Authority of BHEL may approve proposals for payment of Interest Free Secured Mobilization Advance (limited to a maximum of 5% of the Contract Value) only in Installation Works in Power Plants under exceptional circumstances.

Interest Free Mobilization Advance shall be disbursed in specifically mentioned stages of major resource mobilization in the beginning of the contract, as specified in the TCC, in three or more instalments with the value of any instalment not more than 2.5% of the Contract Value. The next instalment will be due only on completion of the activities linked to the previous instalment.

Each such instalment is to be secured through BG of 100% of the instalment amount. Recovery of Interest Free Secured Advance shall be made @ 10% of Running Bill Amount. As and when the total recovered amount exceeds any of the BG value submitted against the advance, that BG shall be returned. In any case, Interest Free Advance shall be fully recovered by the time the contract reaches 50% of the original contract period either from Running Bills or by the Contractor directly depositing the amount. If the Contractor fails to deposit the total amount by the stipulated date, the recovery shall be made by encashing BGs/ Securities available with BHEL for the balance amount.

2.13.2 INTEREST BEARING ADVANCE:

2.13.2.1 INTEREST BEARING MOBILIZATION ADVANCE: Competent authority may also approve need based Interest Bearing Mobilization advance after a certification from the Contractor for having achieved a financial progress of 10% of the original contract price. However, the total

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mobilization advance (including Interest Free Mobilization Advance) shall not exceed 10% of the Contract Value. Bank Guarantee towards 'Interest Bearing Recoverable Advance' shall be 110% of the advance so as to enable recovery of not only principle amount but also the interest portion, if so required.

2.13.2.2 INTEREST BEARING SECURED ADDITIONAL INTERIM ADVANCE: In exceptional circumstances, with due justification, Competent Authority of BHEL may approve proposals for payment of additional interim interest-bearing advance against Bank Guarantee, for resource augmentation towards expediting work for project implementation. Contractor shall establish the utilization of advance drawn in the form of Utilization Certificate before the release of next instalment.

Bank Guarantee shall be 110% of the advance so as to enable recovery of not only principle amount but also the interest portion, if so required. Unadjusted amount of advances (including Interest Free Mobilization Advance) paid shall not exceed 10% of the total contract value at any point of time.

NOTES for INTEREST BEARING ADVANCE:

- (a) Recovery of Interest Bearing Advances shall be made from the Running Bills progressively. Recovery rate per month for Interest Bearing Advances shall be the sum of:
 - i) Not less than 10% of Running Bill amount
 - ii) Simple interest up to the date of RA Bill on the outstanding Principle amount/amounts
- (b) In any case, Interest Bearing Advance shall be fully recovered by the time the contractor's billing reaches 90% of contract value either from Running Bills or by the Contractor directly depositing the amount. If the Contractor fails to deposit the total amount by the stipulated date, the recovery shall be made by encashing BGs/ Securities available with BHEL for the balance amount along with interest.
- (c) Payment and recovery of any of the above advance(s) shall be at the sole discretion of BHEL and shall not be a subject matter of arbitration.
- (d) The rate of interest applicable for the above advances shall be the repo rate prevailing on the date of release of advance plus 4%, and such rate will remain fixed till the total advance amount is recovered.
- (e) Contractor to submit Bank Guarantee as per prescribed formats for each of the advance and shall be valid for at least one year or the recovery duration whichever is earlier. In case the recovery of dues does not get completed within the aforesaid BG period, the contractor shall renew the BG or submit fresh BG for the outstanding amount, valid for at least one year or the remaining recovery duration whichever is earlier. For each advance, the Contractor will be allowed to submit more than one BG so that the BGs can be returned progressively based on recovered amount. In case, the Contractor prefers to submit single BG against an advance, the amount of BG may be progressively reduced by the amount repaid by the Contractor. (f) BHEL is entitled to make recovery of the entire outstanding amount in case the contractor fails to comply with the BG requirement.

2.13.3 SECURED ADVANCE AGAINST MATERIAL BROUGHT TO SITE:

Secured advance on the security of materials (which are not combustible, fragile or perishable in nature) brought to the site but not yet incorporated in the works will be made up to 75% of Invoice value, or the 75% of the corresponding value of the materials determined on the basis of BOQ rates, whichever is less, subject to the condition that their quantities are not excessive and shall be used within a period of 90 days and subject to the stipulations, as mentioned below:

- (i) Contractor shall obtain prior permission of Engineer-in-charge before procurement of materials against which advance is being sought. Engineer-in-charge shall ensure formal approval of Construction Manager before communicating the permission to Contractor.

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- (ii) Secured advance shall not be allowed/ payable for materials procured by Contractor before the date of such permission.
- (iii) Secured Advance shall be allowed only once against a single invoice. Multiple Secured Advance against single invoice is not allowed.
- (iv) Secured advance against materials shall be paid only against non-perishable items. Engineer-in-charge to ensure that such items are adequately covered under insurance cover (to be taken by the Contractor if not covered under BHEL Insurance Policy).
- (v) At any point of time, the unadjusted secured payments against material brought to site shall not be more than 5% of the Contract Value.
- (vi) The advance will be repaid from each succeeding Running bill(s) to the extent materials for which advance has been previously paid have been incorporated into the works. In any case, such advance payment shall be fully recovered maximum from 3-4 subsequent RA bills whether the material is consumed in the work or not. In absence of sufficient value of RA bills for making the required recovery, the Contractor shall deposit the balance amount. If the Contractor fails to deposit the total amount by the stipulated date, the recovery shall be made by encashing the Securities available with BHEL for the balance amount.
- (vii) Contractor has to give a formal deed of hypothecation, drawn up on non-judicial stamp paper under which the BHEL secures a lien on the materials and is safeguarded against losses, due to the contractor postponing the execution of the work or due to the shortage or misuse of materials and against the expenses incurred on their watch and safe custody.

2.14 QUANTITY VARIATION**2.14.1 Variation in Final Executed Contract Value**

The quantities given in the contract are tentative and may change to any extent (both in plus side and minus side). No compensation becomes payable in case the variation of the final executed contract value is within the limits of Minus (-) 15% of awarded contract value. Also, no compensation becomes payable in case the contract gets partially executed/ short closed/ terminated/ work withdrawn under Rights of BHEL mentioned in Clause 2.7 of GCC. In case of work terminated/ short closed under clause 2.7.4 of GCC, compensation may be considered only if BHEL receives compensation from customer.

Compensation due to variation of final executed contract value in excess of the limits defined in clause above, shall be as follows:

- i) In the event the finally executed contract value reduces below the lower limit of awarded Contract Value due to quantity variation specified above, the Contractor will be eligible for compensation @ 15% of the difference between the lower limit of the awarded contract value and the actual executed contract value.
- ii) In the event the finally executed contract value increases above the awarded Contract Value due to quantity variation, the Contractor is not eligible for any compensation.

2.14.2 Variation in Individual Quantities of BOQ Item(s)

The quantities given in the contract are tentative and may change to any extent (both in plus side and minus side). No compensation becomes payable in case the variation of the quantity of individual BOQ item(s) is within the limits of Plus (+) 100% of the quantity in the original price schedule in this regard.

In case executed quantity for a particular BOQ item(s) exceeds two times the quantity in the original price schedule (100% increase), then the revision in rates for such BOQ item(s) for the quantity in excess of two times the quantity in the original price schedule including any subsequent increase in quantity, may be considered based on request from the Contractor, however, BHEL decision in this regard shall be final. Revised rates for subject BOQ item(s) shall

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be worked out on the basis of prevailing market rates mutually agreed between BHEL and Contractor. PVC/ ORC will not be applicable for these revised rates.

BHEL, however, retains the right to arrange the excess quantity through any other source for expediting activities in the interest of the Project.

Note:

- (a) Revision in rates under clause 2.14.2 will remain admissible in those cases also, where, the Contractor is eligible for compensation under clause 2.14.1 i).
- (b) The value of work executed at revised rates due to variation in Individual Quantities of BOQ Item(s) shall be included while calculating the finally executed contract value in clause no. 2.14.1 above.

2.15 EXTRA WORKS

2.15.1 All rectifications/modifications, revamping and reworks required for any reasons not due to the fault of the contractor, or needed due to any change in deviation from drawings and design of equipment, operation/maintenance requirements, mismatching or due to damages in transit, storage and erection/commissioning and other allied works which are not very specifically indicated in the drawings, but are found essential for satisfactory completion of the work, will be considered as extra works.

2.15.2 Extra works arising on account of the contractor's fault, irrespective of time consumed in rectification of the damage/loss, will have to be carried out by the contractor free of cost. Under such circumstances, any material and consumable required for this purpose will also have to be arranged by the contractor at his cost.

2.15.3 All the extra work should be carried out by a separately identifiable gang, without affecting routine activities. Daily log sheets in the pro-forma prescribed by BHEL should be maintained and shall be signed by the contractor's representative and BHEL engineer. No claim for extra work will be considered/entertained in the absence of the said supporting documents i.e. daily log sheets. Signing of log sheets by BHEL engineer does not necessarily mean the acceptance of such works as extra works.

2.15.4 BHEL retains the right to award or not to award any of the major repair/ rework/ modification/ rectification / fabrication works to the contractor, at their discretion without assigning any reason for the same.

2.15.5 After eligibility of extra works is established and finally accepted by BHEL engineer/designer, payment will be released on competent authority's approval at the following rate.

MAN-HOUR RATE FOR ELIGIBLE EXTRA WORKS: Single composite average labour man-hour rate, including overtime if any, supervision, use of tools and tackles and other site expenses and incidentals, consumables for carrying out any major rework/repairs/ rectification/ modification/ fabrication as certified by site as may arise during the course of erection, testing, commissioning or extra works arising out of transit ,storage and erection damages, payment, if found due will be at Rs139/- per man hour.

2.15.6 The above composite labour man hour rate towards extra works shall remain firm and not subject to any variation during execution of the work. PVC will not be applicable for extra works. Rate revision, Over Run Charges/compensation etc. will not be applicable on extra works.

2.15.7 Extra Works for Civil Packages shall be regulated as follows –

- i) Rates for Extra Works arising due to (1) non availability of BOQ (Rate Schedule), OR (2) change in Specifications of materials/works (3) rectification/modification/dismantling & re-erecting etc. due to no fault of Contractor, shall be in the order of the following:

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- a) Item rates are to be derived from similar nature of items in the BOQ (Rate Schedule) with applicable escalation derived from All India Consumer Price Index for Whole Sale Commodities.
- b) As per latest edition of CPWD-DSR with applicable escalation derived from All India Consumer Price Index for Whole Sale Commodities OR Notification issued by the office of CPWD for 'Cost Index' in that Region where the project is being executed with applicable escalation derived from All India Consumer Price Index for Whole Sale Commodities, whichever is less.
- c) Item rates are to be worked out on the basis of market rates prevailing on the date of execution mutually agreed between BHEL and Contractor.
- ii) PVC and ORC will not be applicable for (i) above.

2.16 SUPPLEMENTARY ITEMS

2.16.1 For NON-Civil Works

Supplementary items are items/works required for completion of entire work but not specified in the scope of work. Subject to certification of such items/works as supplementary items by BHEL Engineer, rates shall be derived on the basis of any one of the following on mutual agreement:

- i) Based on percentage breakup/rates indicated for similar/nearby items.
- ii) In case (i) above does not exist, then BHEL/site may derive the percentage breakup/rates to suit the type of work.

2.16.2 For Civil Works

- i) Rates for Supplementary Works/Additional Works arising out due to additions/alterations in the original scope of works as per contract subject to certification of BHEL Engineer shall be worked out as under:
 - a) Item rates which are available in existing BOQ (Rate Schedule) shall be operated with applicable escalation derived from All India Consumer Price Index for Whole Sale Commodities
Items of works which are not available in existing BOQ shall be operated as an 'Extra Works' and rate shall be derived as per clause no 2.15.7
 - ii) Execution of Supplementary Works/Additional Works through the Contractor shall be at the sole discretion of BHEL, and shall be considered as part of executed contract value for the purpose of Quantity Variation as per clause 2.14
 - iii) BHEL Engineer's decision regarding fixing the rate as above is final and binding on the contractor.
 - iv) PVC and ORC will not be applicable for (i) above.

2.17 PRICE VARIATION COMPENSATION –

- 2.17.1 In order to take care of variation in cost of execution of work on either side, due to variation in the index of LABOUR, HIGH SPEED DIESEL OIL, WELDING ROD, CEMENT, STEEL, MATERIALS, Price Variation Formula as described herein shall be applicable.
- 2.17.2 85% component of Contract Value shall be considered for PVC calculations and remaining 15% shall be treated as fixed component. The basis for calculation of price variation in each category, their component, Base Index, shall be as under:

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SL NO.	CATEGORY	INDEX/ AVERAGE MINIMUM WAGE	PERCENTAGE COMPONENT ('K')				
			CIVIL PACKAGES (See Note A/B/C)			MECHANICAL PACKAGES	Electrical , C&I Material Management/ Handling and other labour oriented Packages
			A	B	C		
i)	LABOUR (ALL CATEGORIES)	(a) 'MONTHLY ALL-INDIA AVERAGE CONSUMER PRICE INDEX NUMBERS FOR INDUSTRIAL WORKERS' published by Labour Bureau, Ministry of Labour and Employment, Government of India. (50% weightage out of component 'K') (Website: labourbureau.nic.in) (b) Arithmetical average of minimum wages of Unskilled, Semi-skilled, Skilled and Highly skilled workers as applicable at project site location (50% weightage out of component 'K')	40	25	30	65	80
ii)	HIGH SPEED DIESEL OIL	Name of Commodity: HSD Commodity Code: 1202000005 (See Note E)	5	3	5	5	5
iii)	WELDING ROD	Name of Commodity: MANUFACTURE OF BASIC METALS Commodity Code: 1314000000 (See Note E)				15	
iv)	CEMENT	Name of Commodity: ORDINARY PORTLAND CEMENT Commodity Code: 1313050003 (See Note E)		20	30		

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v)	STEEL (Structural and Reinforcement Steel)	Name of Commodity: MILD STEEL: LONG PRODUCTS Commodity Code: 1314040000 (See Note E)		25			
vi)	All OTHER MATERIALS (Other than Cement & Steel)	Name of Commodity: ALL COMMODITIES Commodity Code:1000000000 (See Note E)	40	12	20		

Note:**A) Cement & Steel: Free Issue (BHEL Scope)****B) Cement & Steel: In Contractor Scope****C) Cement in Contractor Scope, and Steel is Free Issue (BHEL Scope)****D) For Composite packages (i.e. Civil + Mechanical + Electrical and/or C&I or Civil + Mechanical or Mechanical + Electrical and/or C&I), the COMPONENT ('K') for various categories shall be as per respective packages as above.****E) As per the 'MONTHLY WHOLE SALE PRICE INDEX' for the respective Commodity and Type, published by Office of Economic Adviser, Ministry of Commerce and Industry, Government of India. (Website: eaindustry.nic.in). Revisions in the index or commodity will be re-adjusted accordingly.**

2.17.3 # Not Applicable

2.17.4 Payment/recovery due to variation in index shall be determined on the basis of the following notional formula in respect of the identified COMPONENT ('K') viz LABOUR, HIGH SPEED DIESEL OIL, WELDING ROD, CEMENT, STEEL, MATERIALS.

$$P = K \times R \times \frac{(X_N - X_0)}{X_0}$$

Where,

P = Amount to be paid/recovered due to variation in the Index for Labour, High Speed Diesel Oil, Welding Rod, Cement, Steel and Materials

K = Percentage COMPONENT ('K') applicable for Labour, High Speed Diesel Oil, Welding Rod, Cement, Steel and Materials

R = Value of work done for the billing month (Excluding Taxes and Duties if payable extra)

X_N = Revised Index for Labour, Revised Average Minimum Wages for Labour, Revised Index for High Speed Diesel Oil, Welding Rod, Cement, Steel and Materials for the billing month under consideration

X₀ = Index for Labour, Average Minimum Wages for Labour, Index for High Speed Diesel Oil, Welding Rod, Cement, Steel and Materials as on the Base date

2.17.5 PVC shall not be payable for the ORC amount, Supplementary/Additional Items, Extra works. However, PVC will be payable for items executed under quantity variation of BOQ items under originally awarded contract.

2.17.6 Base date shall be calendar month of the 'last date of submission of Tender'.

2.17.7 The contractor shall furnish necessary monthly bulletins in support of the requisite indices from the relevant websites along with his Bills.

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2.17.8 The contractor will be required to raise the bills for price variation payments on a monthly basis along with the running bills irrespective of the fact whether any increase/decrease in the index for relevant categories has taken place or not. In case there is delay in publication of bulletins (final figure), the provisional values as published can be considered for payments and arrears shall be paid/recovered on getting the final values.

2.17.9 PVC shall be applicable for the entire original contract period plus the extended period, i.e. for the complete execution period, as follows:

For PVC computation of the n^{th} month:

Let the cumulative delay attributable to the Contractor is D_n in the n^{th} month as per Form-14.

Considering R_n as the billing value for the n^{th} month, PVC for the n^{th} month shall be calculated as follows:

- PVC for the portion of R_n for an amount of $D_{(n-1)}$ shall be payable as per indices for the $(n-1)^{\text{th}}$ month.
- PVC for the balance portion of R_n shall be payable as per indices for the n^{th} month

In case $D_{(n-1)}$ is greater than R_n , then entire R_n shall be payable as per indices for the $(n-1)^{\text{th}}$ month and the balance portion of $D_{(n-1)}$ shall be adjusted from $R_{(n+1)}$ of the $(n+1)^{\text{th}}$ month and will be payable as per indices for the $(n-1)^{\text{th}}$ month. The above process shall be continued for subsequent month(s) also till full $D_{(n-1)}$ is consumed.

- For milestones mentioned in the contract, PVC shall be applicable as per average of the indices from the month of base date till the month of execution of milestone. ii) PVC shall not be applicable for time extension provided for the delays solely attributable to the contractor. No PVC is payable during the period of Provisional Time Extension till grant of final time extension. Applicability of PVC will be decided at the time of grant of final time extension.
- The total amount of PVC shall not exceed 15% of the cumulatively executed contract value. Executed contract value for this purpose is exclusive of PVC, ORC, Supplementary/Additional Items and Extra works except items due to quantity variation.

Note: Work Planning in F-14 format to be meticulously done as per Clause 2.9 of this GCC.

2.18 INSURANCE

2.18.1 BHEL/their customer shall arrange for insuring the materials/properties of BHEL/customer covering the risks during transit, storage, erection and commissioning.

2.18.2 It is the sole responsibility of the contractor to insure his materials, equipment, workmen etc. against accidents and injury while at work and to pay compensation, if any, to workmen as per Workmen's compensation Act. The work will be carried out in a protected area and all the rules and regulations of the client /BHEL in the area of project which are in force from time to time will have to be followed by the contractor.

2.18.3 If due to negligence and or non-observation of safety and other precautions by the contractors, any accident/injury occurs to the property / manpower belong to third party, the contractor shall have to pay necessary compensation and other expense, if so decided by the appropriate authorities.

2.18.4 The contractor will take necessary precautions and due care to protect the material, while in his custody from any damage/ loss due to theft or otherwise till the same is taken over by BHEL or customer. For lodging / processing of insurance claim, the contractor will submit necessary documents. BHEL will recover the loss including the deductible franchise from the contractor, in case the damage / loss is due to carelessness / negligence on the part of the contractor. In case of any theft of material under contractor's custody, matter shall be reported to Police by the

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contractor immediately and copy of FIR and subsequently police investigation report shall be submitted to BHEL for taking up with insurance. However, this will not relieve the contractor of his contractual obligation for the material in his custody.

2.19 STRIKES & LOCKOUT

2.19.1 The contractor will be fully responsible for all disputes and other issues connected with his labour. In the event of the contractor's labour resorting to strike or the Contractor resorting to lockout and if the strike or lockout declared is not settled within a period of one month, it may be considered as 'Breach of Contract' under Clause 2.7 and the remedies under Clause 2.7.2.2 may be executed, at the discretion of BHEL.

2.19.2 For all purposes whatsoever, the employees of the contractor shall not be deemed to be in the employment of BHEL.

2.20 FORCE MAJEURE

2.20.1 "Force Majeure" shall mean circumstance which is:

- a) beyond control of either of the parties to contract,
- b) either of the parties could not reasonably have provided against the event before entering into the contract,
- c) having arisen, either of the parties could not reasonably have avoided or overcome, and
- d) is not substantially attributable to either of the parties And Prevents the performance of the contract,

Such circumstances include but shall not be limited to:

- i) War, hostilities, invasion, act of foreign enemies.
- ii) Rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war.
- iii) Riot, commotion or disorder by persons other than the contractor's personnel and other employees of the contractor and sub-contractors.
- iv) Strike or lockout not solely involving the contractor's personnel and other employees of the contractor and sub-contractors.
- v) Encountering munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the contractor's use of such munitions, explosives, radiation or radio- activity.
- vi) Natural catastrophes such as earthquake, tsunami, volcanic activity, hurricane or typhoon, flood, fire, cyclones etc.
- vii) Epidemic, pandemic etc.

2.20.2 The following events are explicitly excluded from Force Majeure and are solely the responsibilities of the non-performing party: a) any strike, work-to-rule action, go-slow or similar labour difficulty (b) late delivery of equipment or material (unless caused by Force Majeure event) and (c) economic hardship.

2.20.3 If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within 15 (fifteen) days after the occurrence of such event.

2.20.4 The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The Time for Completion shall be extended by a period of time equal to period of delay caused due to such Force Majeure event.

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2.20.5 Delay or non-performance by either party hereto caused by the occurrence of any event of Force Majeure shall not

- a) Constitute a default or breach of the Contract.
- b) Give rise to any claim for damages or additional cost expense occasioned thereby, if and to the extent that such delay or non-performance is caused by the occurrence of an event of Force Majeure.

2.20.6 BHEL at its discretion may consider short closure of contract after 1 year of imposition of Force Majeure in line with extant guidelines. In any case, Supplier/Vendor cannot consider deemed short-closure after 1 year of imposition of Force Majeure.

2.21 SETTLEMENT OF DISPUTE:

If any dispute or difference of any kind whatsoever shall arise between BHEL and the Supplier/Vendor, arising out of the contract for the performance of the work whether during the progress of contract termination, abandonment or breach of the contract, it shall in the first place referred to Designated Engineer for amicable resolution by the parties. Designated Engineer (to be nominated by BHEL for settlement of disputes arising out of the contract) who within 60 days after being requested shall give written notice of his decision to the contractor. Save as hereinafter provided, such decision in respect of every matter so referred shall forthwith be given effect to by the Supplier/Vendor who shall proceed with the work with all due diligence, whether he or BHEL desires to resolve the dispute as hereinafter provided or not.

If after the Designated Engineer has given written notice of this decision to the party and no intention to pursue the dispute has been communicated to him by the affected party within 30 days from the receipt of such notice, the said decision shall become final and binding on the parties. In the event the Supplier/Vendor being dissatisfied with any such decision or if amicable settlement cannot be reached then all such disputed issues shall be resolved through conciliation in terms of the BHEL Conciliation Scheme 2018 as per Clause 2.21.1.

2.21.1 Conciliation:

Any dispute, difference or controversy of whatever nature howsoever arising under or out of or in relation to this Agreement (including its interpretation) between the Parties, and so notified in writing by either Party to the other Party (the “Dispute”) shall, in the first instance, be attempted to be resolved amicably in accordance with the conciliation procedure as per BHEL Conciliation Scheme 2018. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in - “Procedure for conduct of conciliation proceedings” (as available in www.bhel.com)).

Note: Ministry of Finance has issued OM reference No. 1/2/24 dated 03.06.2024 regarding “Guidelines for Arbitration and Mediation in Contracts of Domestic Public Procurement. In the said OM it has been recommended that Government departments/

Entities/agencies are to encourage mediation under the Mediation Act. 2023 . The said Act has not yet been notified by the Government. Therefore, the clause “Settlement of Disputes” shall be modified accordingly as and when the Mediation Act 2023 gets notified.

2.21.2 ARBITRATION:

2.21.2.1 Except as provided elsewhere in this Contract, in case Parties are unable to reach amicable settlement (whether by Conciliation to be conducted as provided in Clause 21.1 herein above or otherwise) in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the Parties; or, in relation to interpretation of any provision of the Contract; or. in any manner touching upon the Contract (hereinafter referred to as the ‘Dispute’), then, either Party may, refer the disputes to Arbitral Institution (to be identified by the contract issuing agency (eg. “IIAC” (India International Arbitration Centre) for Delhi/NCR offices) and such dispute to be

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adjudicated by Sole Arbitrator appointed in accordance with the Rules of said Arbitral Institution.

- 2.21.2.2 A party willing to commence arbitration proceeding shall invoke Arbitration Clause by giving notice to the other party in terms of section 21 of the Arbitration & Conciliation Act, 1996 (hereinafter referred to as the 'Notice') before referring the matter to arbitral institution. The Notice shall be addressed to the Head of the Region, Power Sector/ Unit, BHEL, executing the Contract and shall contain the particulars of all claims to be referred to arbitration with sufficient detail and shall also indicate the monetary amount of such claim including interest, if any.
- 2.21.2.3 After expiry of 30 days from the date of receipt of aforesaid notice, the party invoking the Arbitration shall submit that dispute to the Arbitral Institutions..... (to be identified by the contract issuing agency) and that dispute shall be adjudicated in accordance with their respective Arbitration Rules. The matter shall be adjudicated by a Sole Arbitrator who shall necessarily be a Retd Judge having considerable experience in commercial matters to be appointed/nominated by the respective institution. The cost/expenses pertaining to the said Arbitration shall also be governed in accordance with the Rules of the respective Arbitral Institution. The decision of the party invoking the Arbitration for reference of dispute to a specific Arbitral institution for adjudication of that dispute shall be final and binding on both the parties and shall not be subject to any change thereafter. The institution once selected at the time of invocation of dispute shall remain unchanged.
- 2.21.2.4 The fee and expenses shall be borne by the parties as per the Arbitral Institutional rules.
- 2.21.2.5 The Arbitration proceedings shall be in English language and the seat and venue of Arbitration shall be (to be identified by the contract issuing agency)(i. e. New Delhi for Delhi/NCR based Units).
- 2.21.2.6 Subject to the above, the provisions of Arbitration & Conciliation Act 1996 and any amendment thereof shall be applicable. All matters relating to this Contract and arising out of invocation of Arbitration clause are subject to the exclusive jurisdiction of the Court(s) situated at..... (i.e. New Delhi for Delhi/NCR based Units).
- 2.21.2.7 Notwithstanding any reference to the Designated Engineer or Conciliation or Arbitration herein, a. the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree. Settlement of Dispute clause cannot be invoked by the Contractor, if the Contract has been mutually closed or 'No Demand Certificate' has been furnished by the Contractor or any Settlement Agreement has been signed between the Employer and the Contractor.
- 2.21.2.8 It is agreed that Mechanism of resolution of disputes through arbitration shall be available only in the cases where the value of the dispute is less than Rs. 10 Crores.
- 2.21.2.9 In case the disputed amount (Claim, Counter claim including interest is Rs. 10 crores and above, the parties shall be within their rights to take recourse to remedies other than Arbitration, as may be available to them under the applicable laws after prior intimation to the other party. Subject to the aforesaid conditions, provisions of the Arbitration and Conciliation Act, 1996 and any statutory modifications or re-enactment thereof as amended from time to time, shall apply to the arbitration proceedings under this clause.
- 2.21.2.10 In case, multiple arbitrations are invoked (whether sub-judice or arbitral award passed) by any party to under this contract, then the cumulative value of claims (including interest claimed or awarded) in all such arbitrations shall be taken in account while arriving at the total claim in dispute for the subject contract for the purpose of clause 21.2.9. Disputes having cumulative value of less than 10 crores shall be resolved through arbitration and any additional dispute shall be adjudicated by the court of competent jurisdiction.

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2.21.3 In case of Contract with Public Sector Enterprise (PSE) or a Government Department, the following shall be applicable:

In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs)/ Port Trusts inter se and also between CPSEs and Government Departments/Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such dispute or difference shall be taken up by either party for resolution through AMRCD (Administrative Mechanism for Resolution of CPSEs Disputes) as mentioned in DPE OM No. 05/0003/2019-FTS10937 dated 14-12-2022 as amended from time to time.

2.21.4 NO INTEREST PAYABLE TO CONTRACTOR

Notwithstanding anything to the contrary contained in any other document comprising in the Contract, no interest shall be payable by BHEL to Contractor on any moneys or balances including but not limited to the Security Deposit, EMD, Retention Money, RA Bills or the Final Bill, or any amount withheld and/or appropriated by BHEL. etc., which becomes or as the case may be, is adjudged to be due from BHEL to Contractor whether under the Contract or otherwise.

2.22 RETENTION AMOUNT

2.22.1 Retention Amount shall be 5% of contract value and shall be furnished before the first RA Bill becomes due for payment. In case of increase in contract value, additional 5% of differential amount shall be submitted by Contractor before payment of next RA Bill due.

The Retention amount of 5% of the contract value may be accepted in the following forms: -

- i. Cash (as permissible under the extant Income Tax Act).
- ii. Local cheques of Scheduled Banks (subject to realization)/ Pay Order/ Demand Draft/ Electronic Fund Transfer in favour of BHEL.
- iii. Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated / pledged, as applicable, in favour of BHEL).
- iv. Bank Guarantee from Scheduled Banks/ Public Financial Institutions as defined in the Companies Act and in line with clause 1.12 of GCC. The Bank Guarantee format for Retention Amount shall be in the prescribed formats. The validity of BG shall be initially for the contract period & shall be extended up to acceptance of final bill if the final bill is not settled during the contract period.
- v. Fixed Deposit Receipt issued by Scheduled Banks/ Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL).
- vi. Insurance Surety Bonds.

Alternatively, on successful bidder's request, the Retention Amount can also be recovered at the rate of 10% of the gross amount, progressively, from each of the running bills of the contractor till the total amount of the required retention amount is collected.

In case, contractor opts cash deduction from RA bills in the beginning & subsequently submit 5% of the Contract Value as Retention amount in any form as mentioned above, then refund of deducted retention amount may be permitted to contractor.

Note:

BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith.

2.22.2 **Refund of Retention Amount shall be as follows:**

Ref: OS/SC/2025-26/98/59, Date: 04.10.2025		ANNEXURE – I
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100% of Retention Amount/ BG shall be released along with Final Bill after deduction all expenses/ other amounts due to BHEL under the contract/ other contracts entered into with them (contractor) by BHEL provided that.

2.22.3 In case of short closure of contract

- a) due to the premature termination of BHEL contract with customer for any reason whatsoever;
- b) upon the request of contractor for any reason, prior to completion and acceptance of Trial Run by the end customer

The retention money equivalent to the 5% of contract value executed by the contractor shall not be refundable and the contractor shall be discharged of his liabilities as provided in the clause 2.22.1

2.23 PAYMENTS

Payments to Contractors are made in any one of the following forms: -

2.23.1 Running Account Bills (RA Bills)

- i) These are for interim payments when the contracts are in progress. The bills for such interim payments are to be prepared by Contractor in prescribed formats (RA Bill forms).
- ii) Payments shall be made according to the extent of work done as per measurements taken up to the end of the calendar month and in line with the terms of payments described in the Tender documents.
- iii) Recoveries on account of electricity, water, statutory deductions etc. are made as per terms of contract.
- iv) Full rates for the work done shall be allowed only if the quantum of work has been done as per the specifications stipulated in the contract. If the work is not executed as per the stipulated specifications, BHEL may ask the contractor to redo the work according to the required specifications, without any extra cost. However, where this is not considered necessary 'OR' where the part work is done due to factors like non-availability of material to be supplied by BHEL 'OR' non availability of fronts 'OR' non availability of drawings, fraction payment against full rate, as is considered reasonable, may be allowed with due regard for the work remaining to be done. BHEL decision in this regard will be final and binding on the contractor.
- v) In order to facilitate part payment, BHEL at its discretion may further split the contracted rates/percentages to suit site conditions, cash flow requirements according to the progress of work, subject to following:
 - a) Provided no 'part' payment is recommended till 25% of work in the item rate is executed.
 - b) Payment of item rate to be made in not more than three instalments, last stage payment to be not lower than 20% of the item rate.

2.23.2 Final Bill

Final Bill' is used for final payment on closing of Running Account for works or for single payment after completion of works. 'Final Bill' shall be submitted as per prescribed format after completion of works as per scope and upon material reconciliation, along with the following:

- i) 'No Claim Certificate' by Contractor as per Clause 2.6.11 of the GCC.
- ii) Clearance certificates where ever applicable viz. Clearance Certificates from Customer, various Statutory Authorities like Labour department, PF Authorities, Commercial Tax Department etc.
- iii) Indemnity Bond as per prescribed format.

BHEL shall settle the final bills after deducting all liabilities of Contractor to BHEL.

2.24 PERFORMANCE GUARANTEE FOR WORKMANSHIP:

- 2.24.1 Even though the work will be carried out under the supervision of BHEL Engineers the Contractor will be responsible for the quality of the workmanship and shall guarantee the work done for a period of Twelve months from the date of commencement of guarantee period as defined in Technical Conditions of Contract, for good workmanship and shall rectify free of cost all defects

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due to faulty erection detected during the guarantee period. In the event of the Contractor failing to repair the defective works within the time specified by the Engineer, BHEL may proceed to undertake the repairs of such defective works by itself, without prejudice to any other rights and recover the cost incurred for the same along with 5% overheads from the Security Deposit.

2.24.2 BHEL shall release the Security Deposit subject to the following

- i) Contractor has submitted 'Final Bill'
- ii) Guarantee period as per contract has expired
- iii) Contractor has furnished 'No Claim Certificate' as per clause 2.6.11 of GCC
- iv) BHEL Site Engineer/Construction Manager has furnished the 'No Demand Certificate' in specified format
- v) Contractor has carried out the works required to be carried out by him during the period of Guarantee and all expenses incurred by BHEL on carrying out such works is included for adjustment from the Security Deposit refundable.

2.25 CLOSING OF CONTRACTS

The Contract shall be considered completed and closed upon completion of contractual obligations and settlement of Final Bill or completion of Guarantee period whichever is later. Upon closing of Contract, BHEL shall issue a performance/ experience certificate as per standard format, based on specific request of Contractor as per extant BHEL guidelines through the online portal available at <https://siddhi.bhel.in> only.

2.26 SUSPENSION OF BUSINESS DEALINGS

BHEL reserves the right to take action against Contractors who either fail to perform or Tenderers/Contractor who indulge in malpractices, by suspending business dealings with them in line with BHEL guidelines issued from time to time.

The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the banned firms / principal / agents, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com.

If any bidder / supplier / contractor during pre-tendering / tendering / post tendering / award / execution / post-execution stage indulges in any act, including but not limited to, mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or tampers the tendering process or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, or does anything which is actionable under the Guidelines for Suspension of Business dealings, action may be taken against such bidder / supplier / contractor as per extant guidelines of the company available on www.bhel.com and / or under applicable legal provisions.

Guidelines for suspension of business dealings is available in the webpage:

http://www.bhel.com/vender_registration/vender.php

2.27 LIMITATION ON LIABILITY:

Notwithstanding anything to the contrary in this Contract or LOA or Work Order or any other mutually agreed document between the parties, the maximum liability, for damages, of the contractor, its servants or agents, shall under no circumstances exceed an amount equal to the Price of the Contract or the Work Order. The Contractor shall not in any case be liable for loss of profit or special, punitive, exemplary, indirect or consequential losses whatsoever. This shall not be applicable on the recoveries made by Customer from BHEL on account of Contractor, any other type of recoveries for workmanship, material, T&P etc. due from the contractor.

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2.28 NON-DISCLOSURE AGREEMENT (NDA):

The bidders shall enter into the Non-disclosure agreement totally voluntarily, with full knowledge of its meaning and without duress. (Format attached).

2.29 CARTEL FORMATION

The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines

2.30 FRAUD PREVENTION POLICY

Bidder along with its associate /collaborators /sub-contractors /sub-vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

2.31 ORDER OF PRECEDENCE:

In the event of any ambiguity or conflict between the contract Documents, the order of precedence shall be in the order below:

- a. Contract agreement with its Amendments/
- b. Clarifications/Corrigenda/Errata etc. issued in respect of the tender documents by BHEL
- c. Notice Inviting Tender (NIT)
- d. Price Bid
- e. Technical Conditions of Contract (TCC)—Volume-1A
- f. Special Conditions of Contract (SCC) —Volume-1B
- g. General Conditions of Contract (GCC) —Volume-1C
- h. Forms and Procedures —Volume-1D

2.32 OTHER ISSUES

2.32.1 Value of Non judicial Stamp Paper for Bank Guarantees and for Contract Agreement shall be not less than Rs 100/- unless otherwise required under relevant statutes.

2.32.2 In case of any conflict between the General Conditions of Contract and Special Conditions of Contract, provisions contained in the Special Conditions of Contract shall prevail.

2.32.3 Unless otherwise specified in NIT, offers from consortium/ JVs shall not be considered.

Ref: OS/SC/2025-26/98/59

Date: 04.10.2025

Sub: Service contract for carrying out HAZOP & SIL study for IOCL- DIGBOI (S.O.8188)- Reg

ACCEPTANCE TO TENDER TERMS & CONDITIONS

I / We hereby confirm that the Tender documents, all Annexures etc. have been studied in detail and we have fully understood the scope of work.

I / We accept to all the Terms and Conditions of the Tender Enquiry and the prices quoted are in accordance with the same.

I / We accept to offer valid for a period of **02 months** from the last date for tender submission.

I / We accept to participate in Reverse Auction.

Tender documents duly signed on all the pages by the Owner / authorized representative of the bidder are attached herewith.

Signature of Tenderer with company seal

CONTRACTOR INFORMATION

Sl. No.	Particulars	To be Filled by Bidder
01.	Name of the Contractor	
02.	Nature of Firm / Concern (Proprietor/ Partnership/ Pvt. Limited/ Public Ltd.) Note: In case of partnership concern, please enclose photo copies of the partnership deed	
03.	Full address	
04.	Name of the Proprietor/Partner	
05.	Name of the Person(s) and designation authorized for signing the contract/dealing with BHEL	
06.	Telephone No. of the firm	
07.	Mobile No.	
08.	E-mail ID	
09.	PAN Number	
10.	GSTIN Registration No.	
11.	HSN / SAC Code	
12.	Udyam Reg No. (if any)	

CHECK LIST

Sl. No.	Particulars	Document Enclosed (Yes / No)	Document No
01.	Name of the Contractor (Company Registration Copy)		
02.	Signed & Stamped NIT along with all Annexures		
03.	GSTIN Registration Certificate		
04.	PAN Number		
05.	PF Registration No.		
06.	ESI Registration No.		
07.	Income Tax Returns for last 3 years		
08.	Work order & Job Completion Certificate in similar works as mentioned in eligibility criteria.		
09.	Udyam Registration certificate		

ACCEPTANCE FOR ELECTRONIC FUND TRANSFER / RTGS / NEFT TRANSFER

01	NAME & ADDRESS OF THE SUPPLIER / SUBCONTRACTOR	
02	VENDOR CODE ASSIGNED BY BHEL, HPVP LTD	

DETAILS OF BANK ACCOUNT

03	NAME & ADDRESS OF THE BANK	
04	NAME OF THE BRANCH	
05	BRANCH CODE	
06	MICR CODE	
07	ACCOUNT NUMBER	
08	TYPE OF ACCOUNT	
09	BENEFICIARY'S NAME	
10	IFSC CODE OF THE BRANCH	
11	EMAIL ID	
12	TELEPHONE / MOBILE NUMBER	

CERTIFICATE

I / We here by agree to receive the payments due from M/s Bharat Heavy Electricals Ltd., by the National Electronic Fund Transfer / or RTGS Transfer mode by credit to my / our above-mentioned Bank account. I / We also agree that payments made to the above-mentioned account are a valid discharge of the liability of M/s Bharat Heavy Electricals Ltd. I / We also agree to bear the applicable Bank charges for the above mode of transfer. A copy of the Cheque leaf/ cancelled Cheque leaf of the above account is sent herewith.

(Authorized Signatories with Name & Seal)

BANKER'S CERTIFICATION

We confirm that we are enabled for receiving RTGS and NEFT credits and we further confirm that the account number of _____
(name of account holder), the signature of authorized signatory and the MICR and IFSC codes of our branch mentioned above are correct.

Place:

Bank Manager / Officer

Date:

Signature with Bank stamp and Name seal

FORWARDED TO ACCOUNTS DEPARTMENT / CASH SECTION

We confirm the above details are verified with the records available with us

Signature of BHEL Official with Name & Seal

Operating the contract / Services

GST COMPLIANCE FOR INDIGENOUS SUPPLIERS / CONTRACTORS

1. In Response to Tenders for Indigenous supplier will be entertained only if the vendor has a valid GSTIN which should be clearly mentioned in the offer. If any specific exemption is available, a declaration with due supporting documents need to be furnished for considering the offer.
2. Supplier shall mention their GSTIN in all their invoices and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain Invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no etc., then the Invoice No which is linked/uploaded in GSTN network shall be clearly indicated), item description as per PO, Quantity, Rate, Value, applicable taxes with nomenclature (like IGST, SGST, CGST & UTGST) separately, HSN/ SAC Code, etc.
3. All invoices shall bear the HSN Code for each item separately (Harmonized System of Nomenclature)/ SAC code (Services Accounting Code).
4. A declaration to the effect that all invoice particulars are/were uploaded in the GSTN network/ portal & all tax liability as per GST rules and regulations have been and will be discharged, shall be mentioned in the invoice. If not mentioned in the invoice, a separate declaration shall be submitted as per the requirement of BHEL.
5. All documents like Test Certificate, LR copy, Guarantee/Warranty certificate, work completion certificate, any other document mentioned in PO, shall be sent along with the vehicle/consignment where ever applicable. For all consignments received within the calendar month, input credit will be availed within that month in line with monthly returns filing cycle. In case of any discrepancy in the document or non-submission of documents mentioned in the PO, then BHEL will not be able to accept or account the material, in such case availing of tax credit will be deferred to next month or so.
6. In case of discrepancy in the data uploaded by supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note (details to be uploaded in GSTN portal) for the shortages or rejections in the suppliers, within the calendar month notified by BHEL.
7. For any such delay in availing of tax credit for reasons attributable to supplier (as mentioned above), interest (calculated @ SBI Base Rate + 6%) along with penalty if any will be deducted for the delayed period i.e. from the month of receipt till the month tax credit is availed, from the running bills.
8. Under GST regime, BHEL has to discharge GST liability on LD recovered from suppliers/ contractors. Hence applicable GST shall also be recoverable from suppliers/contractors on LD amount. For this Debit note will be issued by BHEL indicating the respective supply invoice number.
9. This is to inform that GST portion of invoice, shall be released only upon Vendor declaring such invoice in his GSTR-1 and receipt of goods and Tax invoice by BHEL and Confirmation of payment of GST thereon by vendor on GSTN portal. Alternatively, BG of appropriate value may be obtained from vendor which shall be valid At least one month after the confirmation of date of payment of GST by vendor on GSTN portal and receipt of Tax invoice and receipt of goods, whichever is later. Above is subject to receipt of goods/service and tax invoice thereof along with vendor declaring invoice in his return and paying GST within timeline prescribed for availing ITC by BHEL.
10. That in case vendor delays Declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from vendor/contractor along with interest levied/ leviable on BHEL.

Note: The above will be followed strictly for Processing vendor payments to ensure GST Compliance.

PRICE BID**BHARAT HEAVY ELECTRICALS LIMITED
HEAVY PLATES & VESSELS PLANT
VISAKHAPATNAM – 530 012**

NAME OF WORK: Service contract for carrying out HAZOP & SIL study for IOCL- DIGBOI (S.O.8188)- Reg.

Tender Enquiry No: OS/SC/2025-26/98/59, Date: 04.10.2025

SCHEDULE OF QUANTITIES & RATES (SOQR)

Line Item No	DESCRIPTION OF WORK	UNIT	Total Amount Including GST in ₹
1	Carrying out HAZOP & SIL study for IOCL- DIGBOI Project	Lumpsum	

Total Amount in words (Including GST):

Note:

- 1) The prices shall remain fixed and firm for an entire period of contract & No additional payment shall be made to contractor over and above the quoted price.
- 2) GST as applicable shall be paid by contractor and same shall be reimbursed on submission of proof of payment as per annexure - GST.
- 3) L1 price evaluation will be done on Total value Lumpsum basis.

Signature of Tenderer with company seal

 IndianOil INDIAN OIL CORPORATION LIMITED.  TECHNIP ENERGIES INDIA LIMITED	PROJECT TITLE
	DR 1.0 EXPANSION PROJECT
	TECHNIP ENERGIES REQUISITION NUMBER
	(To be filled)
	TECHNIP ENERGIES DOCUMENT NUMBER
(To be filled)	
EQUIPMENT NUMBER	
(To be filled)	
VENDOR DOCUMENT NUMBER	
4-DS-003-U1010	
HAZOP STUDY METHODOLOGY	
 	CODE STAMP

00	20.09.2025	ISSUED FOR ENGINEERING	AKS	AKS/UKK	YPK
Rev	Date DD-MM-YYYY	Revision Purpose	Written	Checked By	PM
DOCUMENT REVISIONS					

Sections changed in last revision are identified by a vertical line in the margin

Plant DR 1.0 EXPANSION PROJECT	Client IOCL, ASSAM REFINERY	Document ID 4-DS-003-U1010	Contract No. 8188
		HAZOP STUDY METHODOLOGY	Rev 00 Page 2 of 7

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बी एच डी एल BHEL इंडियन ऑयल IndianOil UnitBirwelco engineering worldwide T.EN TECHNIP ENERGIES		HAZOP STUDY METHODOLOGY							
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HAZOP STUDY METHODOLOGY

1. INTRODUCTION

HAZOP is a technique used to identify potential hazards and operating problems of the plant. For the documentation the computer program PhaWorks 5.27 will be used. All action points shall be followed up and finalised before the HAZOP Report is approved in all aspects.

2. SCOPE OF WORK

Technip Energies has been engaged by Indian Oil Corporation Ltd. (IOCL) as EPCM Consultant for its LSTK Package for DCU Heater for DR 1.0 expansion project at IOCL Digboi refinery Assam, India.

HAZOP study will be carried out for the project scope on frozen P&IDs as per the general guidelines given in the sections elaborated below.

3. METHODOLOGY

3.1 Scope of the Study

HAZOP study is carried out by dividing the plant into different nodes. Each process unit consists of several nodes. A list of the identified nodes shall be documented and these nodes shall also be marked on the P&ID copies.

The following conditions shall be investigated:

- ❖ abnormal conditions in the following parameters:
 - flow
 - temperature
 - pressure
 - composition
 - level
- ❖ failure of utilities:
 - instrument air failure
 - electrical power failure
 - cooling water flow failure
 - inert gas failure

For the four parameters under "failure of utilities", consequences will be investigated for a general failure or a failure at a single consumer point (e.g. instrument air failure at a single control valve).

Excluded from the investigation are:

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- Double-jeopardy events
- Total failure of equipment or piping
- Failure of safety valves
- Manually blocked trips or interlocks (overrides) during normal operation
- External fire as source of heat
- Manual Operator errors

Only one malfunction at a time will be investigated. It is assumed that the plant is either operating under normal condition or under shut down/start-up conditions. Controllers might be in automatic mode (normal case for most controllers) as well as in manual mode.

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3.2 Parameters and Guidewords

The parameters used correspond to the scope of study defined above:

- ✚ flow
- ✚ temperature
- ✚ pressure
- ✚ composition
- ✚ level
- ✚ instrument air
- ✚ electrical power
- ✚ cooling water flow

Guide-words	Parameters						
	Pressure.	Temp.	Flow	Composition	Level	Instr. Air, El. Power , CW Flow, ESD Valve	Operability
More	√	√	√	√	√		
Less	√	√	√	√	√		
Part of							
No			√			√	√ (3)
As well as				√ (1)			
Reverse			√				
Vacuum	√						
Other than				√ (2)			

- (1) Contamination, liquid carry-over
(2) Incorrect material
(3) Guideword according to list

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4. Working Steps

For each node, the relevant parameters will be investigated. For each parameter, each guideword will be checked as follows: first, all possible causes are collected. Then, the consequences and safeguards are discussed. In case additional safeguards or counter measures have to be implemented, a list of pending actions is issued.

5. TEAM COMPOSITION

HAZOP study is a team exercise comprising expertise from all relevant project disciplines, which include:

- Chairman
- Scribe
- Process Engineer(s)
- Instrument and Control Engineer
- Operations / Commissioning Representative (Owner/ PMC)
- Licensor, as applicable
- Package Unit Vendors, as applicable

Specific engineering disciplines may be called upon to participate in the HAZOP workshop as required.

6. DOCUMENTS REQUIRED FOR THE HAZOP STUDY

Prior to starting the HAZOP Study each node will be marked up in the P&IDs. Following documents shall be available during the study:

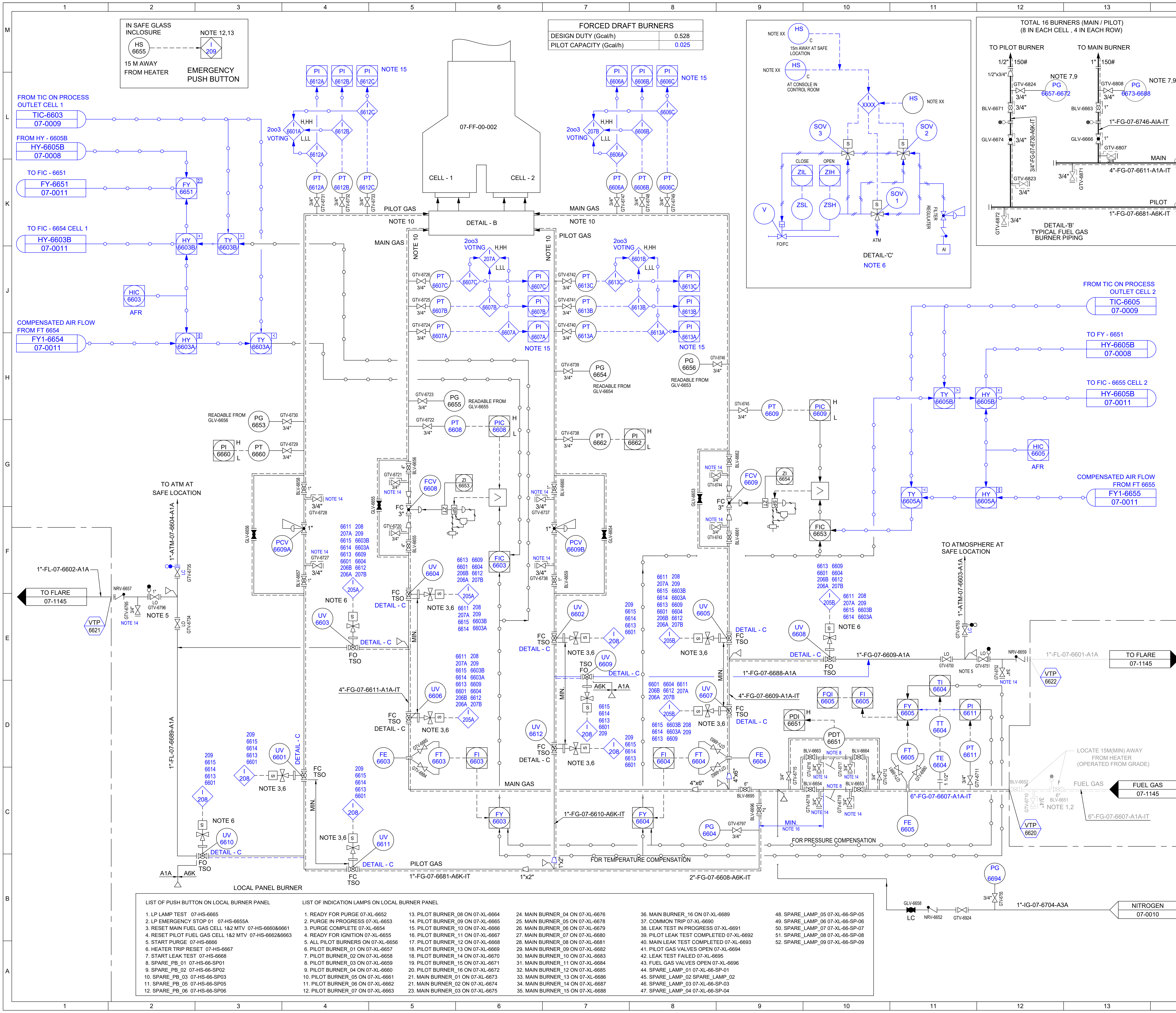
- List of P&IDs
- P&IDs with nodes highlighted in colour
- Description of the nodes
- PFDs
- Piping specification
- Equipment specifications
- Trip and interlocking schedule
- Material Safety Data sheet
- Process description
- Plot plan

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7. HAZOP STUDY REPORT

A consolidated HAZOP study report will be prepared after the HAZOP study is completed. This report will consist of the following and shall be issued to Owner/PMC/ Vendors (As applicable) for records.

- a. List of Nodes
- b. Node marked P&IDs
- c. HAZOP Worksheets
- d. List of Recommendations from HAZOP Study
- e. Attendance Sheet



GENERAL NOTES:

A. FOR STANDARD SYMBOLS DETAILS AND LEGEND SHEETS SEE DRAWINGS 07154C-0000-PID-0090-0010 . 1

B. ALL INSTRUMENT TAGS TO BE PREFIXED BY UNIT NUMBER 07.

C. FOR TRIP LOGIC, REFER TO CAUSE AND EFFECT CHART DOC. NO. MR-00-0110-0001-A3505-0002

NOTES:

1. THESE VALVES ARE LOCATED AT GRADE. 15M AWAY FROM FURNACE AND AT SAFE ACCESSIBLE LOCATION.

2. API - 553 TYPE "B" FIRE SAFE EBY.

4. I - 209 AN EMERGENCY PUSH BOTTOM IS PROVIDED AT MAIN CONTROL ROOM PRESSING WHICH FUEL TO FURNACE SHALL CUT OFF. IN ADDITION OF THIS A LOCAL EMERGENCY PUSH BUTTON (AT 15M AWAY FROM FURNACE) IS PROVIDED IN A BREAK GLASS ENCLOSURE.

5. FLARE LINE ISOLATION VALVE TO BE INSTALLED ONLY IN THE HORIZONTAL LINE WITH STEM IN DOWNWARD POSITION TO AVOID FREE FALL GATE & BLOCKAGE OF FLARE SYSTEM.

6. ALL SHUT DOWN VALVES AND LIMIT SWITCHES ARE PROVIDED WITH 2003 CONFIGURATION.

7. ONE NUMBER OF PRESSURE INSTRUMENT IS PROVIDED BEFORE FUEL SUPPLY CONNECTION TO EACH BURNER / PILOT.

8. STRAINER MESH SIZE SHALL BE LIMITED TO 200 MICRONS.

9. REFER P&ID DOC. NUMBER MR-00-0110-0001-A0103-0009 / SHT. 2 OF 2 FOR TAG DETAILS.

10. BURNER GAS PIPING DOWNSTREAM OF CONTROL VALVE SHALL BE HYDRAULICALLY SYMMETRICAL UP TO INDIVIDUAL BURNER.

11. TAPING OF EACH INDIVIDUAL MAIN / PILOT BURNER FUEL LINE SHALL BE FROM TOP OF THE HEADER PIPE.

12. ALL EMERGENCY PUSH BUTTON CONTAINS 2003 ELEMENT INSIDE IT.

13. THE VALVES THAT ARE 15M AWAY FROM THE HEATER WILL BE SUPPLIED LOOSE BY BHEL & INSTALLED BY CLIENT AT SITE.

14. ALL DRAIN OF THE FUEL SKID TO BE CONNECTED WITH COMMON HEADER & TERMINATED AT BATTERY LIMIT.

15. ALL ALARMS FOR TRIP SIGNAL GENERATED IN PLC AFTER 2003 VOTING SHALL BE ROUTED IN DCS.

16. PILOT HEADER SHALL BE CONNECTED DOWNSTREAM OF STRAINER AT MINIMUM DISTANCE AS POSSIBLE.

HOLDS:

1. CONTROL VALVE, ON-OFF VALVE , SELF ACTUATING VALVE SIZE SIZE.

REFERENCES

MR-00-0110-0001-A2001-0001 : GENERAL ARRANGEMENT DRAWING

214227C-00-JSD-1300-0002 : PIPING MATERIAL SPECIFICATION

6102-07-P&ID-2166 : P&ID PRE CRACKER & FLASHER SECTION

MR-00-0110-0001-A0103-0009 : HEATER P&ID

MR-00-0110-0001-A0103-0010 : UTILITY DISTRIBUTION P & ID

MR-00-0110-0001-A0103-0011 : HEATER APH P & ID

214227C-00-PID-0090 : LEGEND & SYMBOLS

1	16-09-2025	ISSUED FOR REVIEW	VN	NS	SB
0	19-08-2025	ISSUED FOR REVIEW	VN	NS	SB
Rev	Date	Status - Description of Issue	Written by	Checked by	Approved by
DOCUMENT CATEGORY			DOCUMENT REVIEW STATUS (BY CLIENT)		
☒ APPROVAL					
☐ REVIEW					
☐ INFORMATION					

PROJECT : DR 1.0 EXPANSION PROJECT
IOCL DIGBOI REFINERY

OWNER :
 INDIAN OIL CORPORATION LTD.

EPCM :
 TECHNIP ENERGIES

EPC CONTRACTOR :
 BHARAT HEAVY ELECTRICALS LTD.,
Heavy Plates & Vessels Plant, Visakhapatnam-530012.

ENGINEERING CONSULTANT :
 UNITBIRWELCO IISP
THERMAL EQUIPMENT PVT. LTD.
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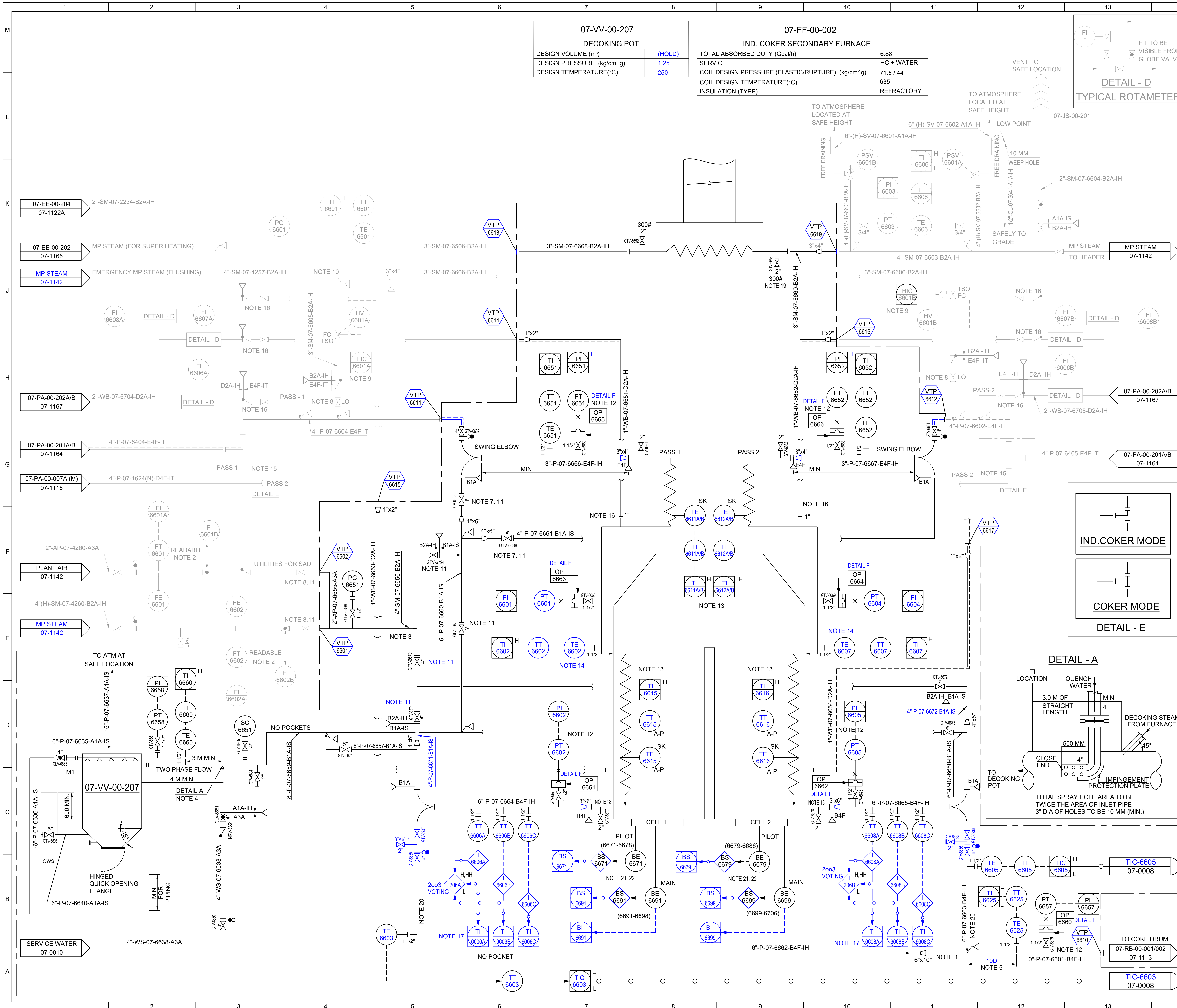
TITLE : FUEL GAS P & ID
IND-COKER^{AT} SECONDARY FURNACE

EPCM DOCUMENT NO. : MR-00-0110-0001-A0103-0008

CONTRACTOR DOCUMENT NO. : 1-00-056-U4105

BIRWELCO IISP DOC. NO. : H24065-002-2021

SCALE	PROJCT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.	PAGE	REV.
1:1	214227C	07	DW	0110	0001	1 OF 1	1



GENERAL NOTES:

A. FOR STANDARD SYMBOLS DETAILS AND LEGEND SHEETS SEE DRAWINGS 077154C-0000-PID-0090-0010_1

B. ALL INSTRUMENT TAGS ARE TO BE PREFIXED BY UNIT NUMBER 07.

C. FOR TRIP LOGIC, REFER TO CAUSE AND EFFECT CHART DOC. NO. MR-00-0110-0001-A3505-0002

NOTES:

1. LINE SUPPORT SHOULD BE SUITABLY DESIGNED TO HANDLE TWO PHASE / SLUG FLOW.

2. LOCAL FLOW INDICATOR ON COIL STEAM LINE SHOULD BE VISIBLE FROM GLOBE VALVE ON RESPECTIVE LINE.

3. STEAM TRAPS SHALL BE PROVIDED AT FLOW POINTS.

4. QUENCH WATER INJECTION AND JOINING OF DECKING LATERALS WITH MAIN HEADER IS INDICATED IN DETAIL-A.

5. ALL THE INSTRUMENTATION AND SAFETY INTERLOCK ARE PROVIDED AS PER OISD 111, 118, 152 & OTHER APPLICABLE STANDARD.

6. ADEQUATE CLEARANCE OF 100 IS MAINTAINED BETWEEN MIXING POINT AND TEMPERATURE INDICATOR AT THE COMMON COIL OUTLET AS A GOOD ENGINEERING PRACTICE AS PER OISD 111.

7. FLOW REVERSAL VALVE IN DECKING MANIFOLD SHALL BE LOCATED AT ONE PLACE FOR EASE OF OPERATION.

8. THESE VALVES TO BE LOCATED AT GRADE, 15M AWAY FROM FURNACE AND AT SAFE ACCESSIBLE LOCATION.

9. LOCATE SWITCH MIN 15 M AWAY FROM HEATER.

10. EMERGENCY STEAM LINE TO INDIVIDUAL HEATER PASSES SHALL BE SO ARRANGED SO THAT CONDENSATE CAN NOT DRAIN BACK TO COIL.

11. VALVES ON DECKING STEAM AND DECKING AIR LINES ARE SUITABLY LOCATED AT ONE PLACE FOR THE EASE OF OPERATION.

12. ALL INSTRUMENTS SHOWN WITH SYMBOL OR ARE OIL PURGE INSTRUMENTS.

13. PER PASS 14 NOS. TUBE SKIN THERMOCOUPLES (TSTC) IN RADIANT AND TWO IN BOTTOM MOST SHOCK ROOF ARE PROVIDED .

TUBE NO	NO. OF TST'S	LOCATION
LAST SIX TUBES PER PASS (IN THE DIRECTION OF FLOW)	2 PER TUBE	ONE AT EACH END AT APPROX. 2610 MM FROM RETURN BEND WELD
TWO MIDDLE TUBES	1 PER TUBE	MIDDLE OF THE TUBE

14. TEMPERATURE ELEMENT IS PROVIDED WITH ELBOLT TOWARDS FLOW DIRECTION.

15. ALTERNATIVE PROVISION FOR ROUTING HOT FEED FROM MF BOTTOM PUMP (07-PA-00-007) A/B (M) TO INDOCKER SECONDARY FURNACE IS PROVIDED FOR DCU MODE OPERATION AND SPOOL VALVE CONNECTION IS PROVIDED TO ACHIEVE THE SAME.

16. TURBULIZING WATER TO BE INJECTED AT THREE DIFFERENT LOCATIONS AS BELOW

1. CONVECTION INLET

2. CROSS OVER

3. 6TH TUBE FROM LAST

17. ALL ALARMS FOR TRIP SIGNAL GENERATED IN PLC AFTER 2003 VOTING SHALL BE ROUTED IN CCS

18. HSC DRAIN LINE TO BE CONNECTED WITH COMMON HEADER AND TERMINATED AT BL.

19. SSH STEAM DRAIN TO BE CONNECTED WITH COMMON HEADER AND TERMINATED AT BL.

20. HEATER OUTLET PIPING OF PASS#1 & #2 TO BE HYDRAULICALLY SYMMETRICAL UP TO THE COMMON HEADER.

21. IONIZATION ROOF FOR PILOT FLAME & UV SCANNER FOR MAIN FLAME ARE PROVIDED.

22. REFER P&ID DOC. NUMBER MR-00-0110-0001-A103-0009 / SHT. 2 OF 2 FOR TAG DETAILS.

HOLDS:

1. DECOKING POT SIZE

REFERENCES

MR-00-0110-0001-A2001-0001	:	GENERAL ARRANGEMENT DRAWING
214227C-00-JSD-1300-0002	:	PIPING MATERIAL SPECIFICATION
6102-07-P&ID-2166	:	P&ID PRE CRACKER & FLASHER SECTION
MR-00-0110-0001-A0103-0008	:	FUEL GAS P&ID
MR-00-0110-0001-A0103-0010	:	UTILITY DISTRIBUTION P & ID
MR-00-0110-0001-A0103-0011	:	HEATER APH P & ID
214227C-00-PID-0090	:	LEGEND & SYMBOLS

1	16-09-2025	ISSUED FOR REVIEW	VN	NS	SB
0	19-08-2025	ISSUED FOR REVIEW	VN	NS	SB
Rev	Date DD-MM-YYYY	Status - Description of Issue	Written by	Checked by	Approved by

DOCUMENT CATEGORY	DOCUMENT REVIEW STATUS (BY CLIENT)
(USE "X" MARK)	
☒ APPROVAL	
☐ REVIEW	
☐ INFORMATION	

PROJECT: DR 1.0 EXPANSION PROJECT
IOCL DIGBOI REFINERY

OWNER :

 **INDIAN OIL CORPORATION LTD.** 

IndianOil Assam Oil

EPCM :



TECHNIP ENERGIES

EPC CONTRACTOR :  **BHARAT HEAVY ELECTRICALS LTD.,**
Heavy Plates & Vessels Plant, Visakhapatnam-530012.

ENGINEERING CONSULTANT : **UNITBIRWELCO IISP**
THERMAL EQUIPMENT PVT. LTD.

 Thermal equipment private limited
 A-110, 2nd Floor, Sector 136, Noida, Uttar Pradesh - 201304
www.unitbirwelco.com

TITLE : HEATER P & ID
IND-COKER^{AT} SECONDARY FURNACE

EPCM DOCUMENT NO. : MR-00-0110-0001-A0103-0009

CONTRACTOR DOCUMENT NO. : 1-00-056-U4106

BIRWELCO IISP DOC. NO. : H24065-002-2020							
SCALE	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.	PAGE	REV.
1:1	214227C	07	DW	0110	0001	1 OF 2	1

1	2		3		4		5		6		
RADIANT CELL 1 BURNERS	1	2	3	4	5	6	7	8			
PILOT IONIZATION ROD	BE-6671	BE-6672	BE-6673	BE-6674	BE-6675	BE-6676	BE-6677	BE-6678			
MAIN FLAME UV SCANNER	BE-6691	BE-6692	BE-6693	BE-6694	BE-6695	BE-6696	BE-6697	BE-6698			

RADIANT CELL 2 BURNERS	1	2	3	4	5	6	7	8
PILOT IONIZATION ROD	BE-6679	BE-6680	BE-6681	BE-6682	BE-6683	BE-6684	BE-6685	BE-6686
MAIN FLAME UV SCANNER	BE-6699	BE-6700	BE-6701	BE-6702	BE-6703	BE-6704	BE-6705	BE-6706

PILOT BURNER INLET PRESSURE INSTRUMENT								
CELL 1	PG-6657	PG-6658	PG-6659	PG-6660	PG-6661	PG-6662	PG-6663	PG-6664
CELL 2	PG-6665	PG-6666	PG-6667	PG-6668	PG-6669	PG-6670	PG-6671	PG-6672

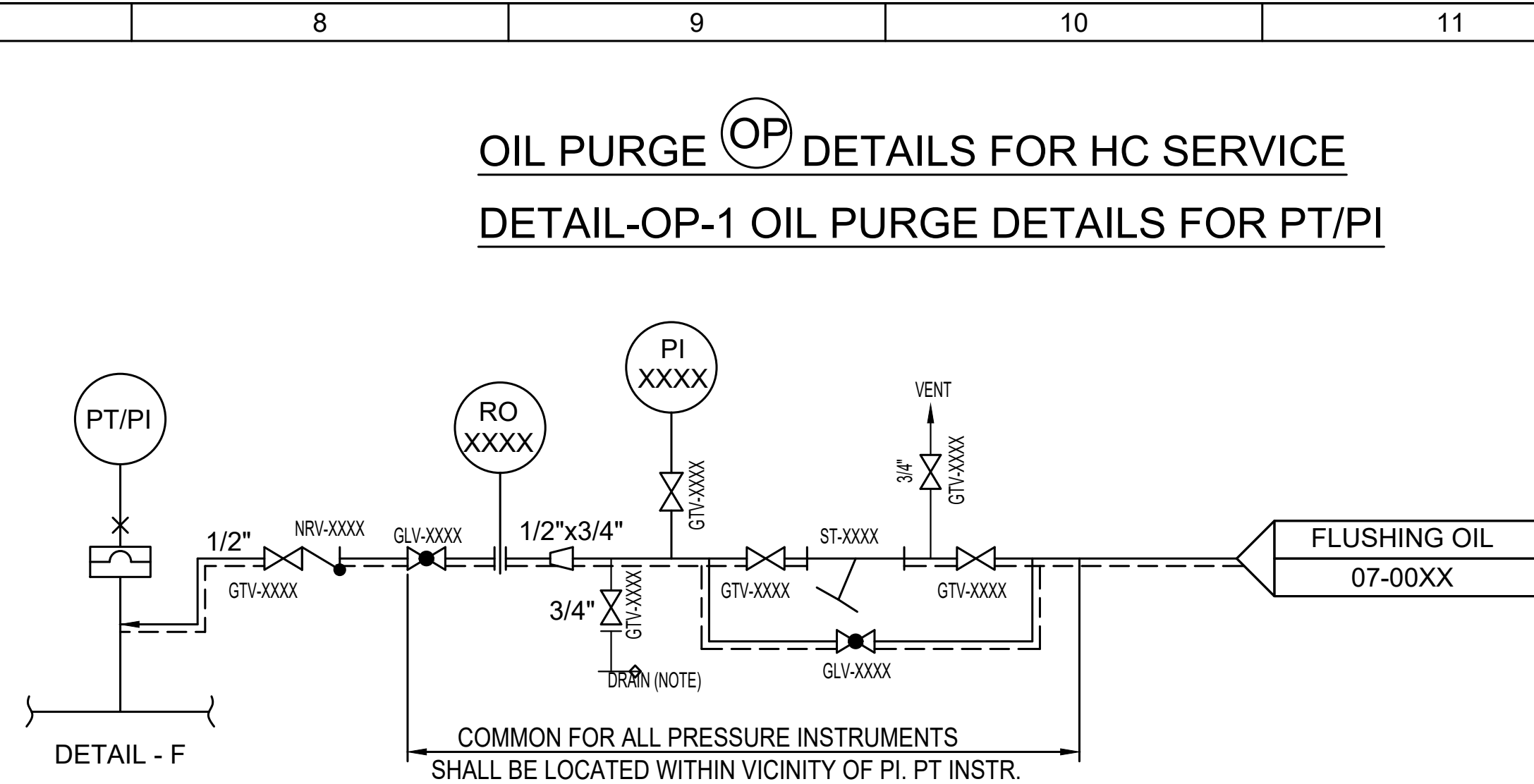
MAIN BURNER INLET PRESSURE INSTRUMENT								
CELL 1	PG-6673	PG-6674	PG-6675	PG-6676	PG-6677	PG-6678	PG-6679	PG-6680
CELL 2	PG-6681	PG-6682	PG-6683	PG-6684	PG-6685	PG-6686	PG-6687	PG-6688

HOT AIR DISTRIBUTION INLET PRESSURE INSTRUMENT								
CELL 1	PG-6711	PG-6712	PG-6713	PG-6714	PG-6715	PG-6716	PG-6717	PG-6718
CELL 2	PG-6719	PG-6720	PG-6721	PG-6722	PG-6723	PG-6724	PG-6725	PG-6726

RADIANT SECTION SKIN THERMOCOUPLE														
PASS 1	TE-6615A	TE-6615B	TE-6615C	TE-6615D	TE-6615E	TE-6615F	TE-6615G	TE-6615H	TE-6615J	TE-6615K	TE-6615L	TE-6615M	TE-6615N	TE-6615P
PASS 2	TE-6616A	TE-6616B	TE-6616C	TE-6616D	TE-6616E	TE-6616F	TE-6616G	TE-6616H	TE-6616J	TE-6616K	TE-6616L	TE-6616M	TE-6616N	TE-6616P

BURNER INLET LINE VALVES								
S.NO.	1	2	3	4	5	6	7	8
CELL 1 MAIN BURNER	GTV- 6807	GTV- 6809	GTV- 6811	GTV- 6813	GTV- 6815	GTV- 6817	GTV- 6819	GTV- 6821
	GTV- 6808	GTV- 6810	GTV- 6812	GTV- 6814	GTV- 6816	GTV- 6818	GTV- 6820	GTV- 6822
	BLV-6663	BLV-6664	BLV-6665	BLV-6666	BLV-6667	BLV-6668	BLV-6669	BLV-6670
	GLV-6666	GLV-6667	GLV-6668	GLV-6669	GLV-6670	GLV-6671	GLV-6672	GLV-6673
CELL 1 PILOT BURNER	GTV- 6823	GTV- 6825	GTV- 6827	GTV- 6829	GTV- 6831	GTV- 6833	GTV- 6835	GTV- 6837
	GTV- 6824	GTV- 6826	GTV- 6828	GTV- 6830	GTV- 6832	GTV- 6834	GTV- 6836	GTV- 6838
	BLV-6671	BLV-6672	BLV-6673	BLV-6674	BLV-6675	BLV-6676	BLV-6677	BLV-6678
	GLV-6674	GLV-6675	GLV-6676	GLV-6677	GLV-6678	GLV-6679	GLV-6680	GLV-6681

BURNER INLET LINE VALVES								
S.NO.	1	2	3	4	5	6	7	8
CELL 2 MAIN BURNER	GTV- 6839	GTV- 6841	GTV- 6843	GTV- 6845	GTV- 6847	GTV- 6849	GTV- 6851	GTV- 6853
	GTV- 6840	GTV- 6842	GTV- 6844	GTV- 6846	GTV- 6848	GTV- 6850	GTV- 6852	GTV- 6854
	BLV-6679	BLV-6680	BLV-6681	BLV-6682	BLV-6683	BLV-6684	BLV-6685	BLV-6686
	GLV-6682	GLV-6683	GLV-6684	GLV-6685	GLV-6686	GLV-6687	GLV-6688	GLV-6689
CELL 2 PILOT BURNER	GTV- 6855	GTV- 6857	GTV- 6859	GTV- 6861	GTV- 6863	GTV- 6865	GTV- 6867	GTV- 6869
	GTV- 6856	GTV- 6858	GTV- 6860	GTV- 6862	GTV- 6864	GTV- 6866	GTV- 6868	GTV- 6870
	BLV-6687	BLV-6688	BLV-6689	BLV-6690	BLV-6691	BLV-6692	BLV-6693	BLV-6694
	GLV-6690	GLV-6691	GLV-6692	GLV-6693	GLV-6694	GLV-6695	GLV-6696	GLV-6697



12

13

REFERENCE P&ID-MR-00-0110-0001-A0103-0010

DE

NDE

NOTE 1

TE

TE

TI

TI

M

	DE	NDE
FD FAN 07-FD-00-603A	TE-6665	TE-6666
FD FAN 07-FD-00-603B	TE-6668	TE-6669
ID FAN 07-FD-00-604	TE-6671	TE-6672

PILOT BURNER INDIVIDUAL LINE NUMBER								
CELL 1	3/4"-FG-07-6730-A6K-IT	3/4"-FG-07-6731-A6K-IT	3/4"-FG-07-6732-A6K-IT	3/4"-FG-07-6733-A6K-IT	3/4"-FG-07-6734-A6K-IT	3/4"-FG-07-6735-A6K-IT	3/4"-FG-07-6736-A6K-IT	3/4"-FG-07-6737-A6K-IT
CELL 2	3/4"-FG-07-6738-A6K-IT	3/4"-FG-07-6739-A6K-IT	3/4"-FG-07-6740-A6K-IT	3/4"-FG-07-6741-A6K-IT	3/4"-FG-07-6742-A6K-IT	3/4"-FG-07-6743-A6K-IT	3/4"-FG-07-6744-A6K-IT	3/4"-FG-07-6745-A6K-IT

MAIN BURNER INDIVIDUAL LINE NUMBER								
CELL 1	1"-FG-07-6746-A1A-IT	1"-FG-07-6747-A1A-IT	1"-FG-07-6748-A1A-IT	1"-FG-07-6749-A1A-IT	1"-FG-07-6750-A1A-IT	1"-FG-07-6751-A1A-IT	1"-FG-07-6752-A1A-IT	1"-FG-07-6753-A1A-IT
CELL 2	1"-FG-07-6754-A1A-IT	1"-FG-07-6755-A1A-IT	1"-FG-07-6756-A1A-IT	1"-FG-07-6757-A1A-IT	1"-FG-07-6758-A1A-IT	1"-FG-07-6759-A1A-IT	1"-FG-07-6760-A1A-IT	1"-FG-07-6761-A1A-IT

MAIN BURNERS TAG NUMBER								
CELL 1	07-FB-00-625	07-FB-00-626	07-FB-00-627	07-FB-00-628	07-FB-00-629	07-FB-00-630	07-FB-00-631	07-FB-00-632
CELL 2	07-FB-00-633	07-FB-00-634	07-FB-00-635	07-FB-00-636	07-FB-00-637	07-FB-00-638	07-FB-00-639	07-FB-00-640

PILOT BURNERS TAG NUMBER								
CELL 1	07-FB-00-641	07-FB-00-642	07-FB-00-643	07-FB-00-644	07-FB-00-645	07-FB-00-646	07-FB-00-647	07-FB-00-648
CELL 2	07-FB-00-649	07-FB-00-650	07-FB-00-651	07-FB-00-652	07-FB-00-653	07-FB-00-654	07-FB-00-655	07-FB-00-656

14	15	16
<u>GENERAL NOTES:</u> A. FOR STANDARD SYMBOLS DETAILS AND LEGEND SHEETS SEE DRAWINGS 077154C-0000-PID-0090-0010_1 B. ALL INSTRUMENT TAGS TO BE PREFIXED BY UNIT NUMBER 07. C. FOR TRIP LOGIC, REFER TO CAUSE AND EFFECT CHART DOC. NO. MR-00-0110-0001-A3505-0002 <u>NOTES:</u> 1. ONE TEMPERATURE ELEMENT PER BEARING FOR ID & FD FANS ARE PROVIDED.		

1	16-09-2025	ISSUED FOR REVIEW	VN	NS	SB
0	19-08-2025	ISSUED FOR REVIEW	VN	NS	SB
Rev	Date DD-MM-YYYY	Status - Description of Issue	Written by	Checked by	Approved by
DOCUMENT CATEGORY			DOCUMENT REVIEW STATUS (BY CLIENT)		
(USE " X " MARK)					
☒ APPROVAL ☐ REVIEW ☐ INFORMATION					

PROJECT :	DR 1.0 EXPANSION PROJECT IOCL DIGBOI REFINERY
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OWNER :



INDIAN OIL CORPORATION LTD.



EPCM :  **TECHNIP ENERGIES**

EPC CONTRACTOR :  **BHARAT HEAVY ELECTRICALS LTD.,**
Heavy Plates & Vessels Plant, Visakhapatnam-530012.

ENGINEERING CONSULTANT : **UNITBIRWELCO IISP**
THERMAL EQUIPMENT PVT. LTD.

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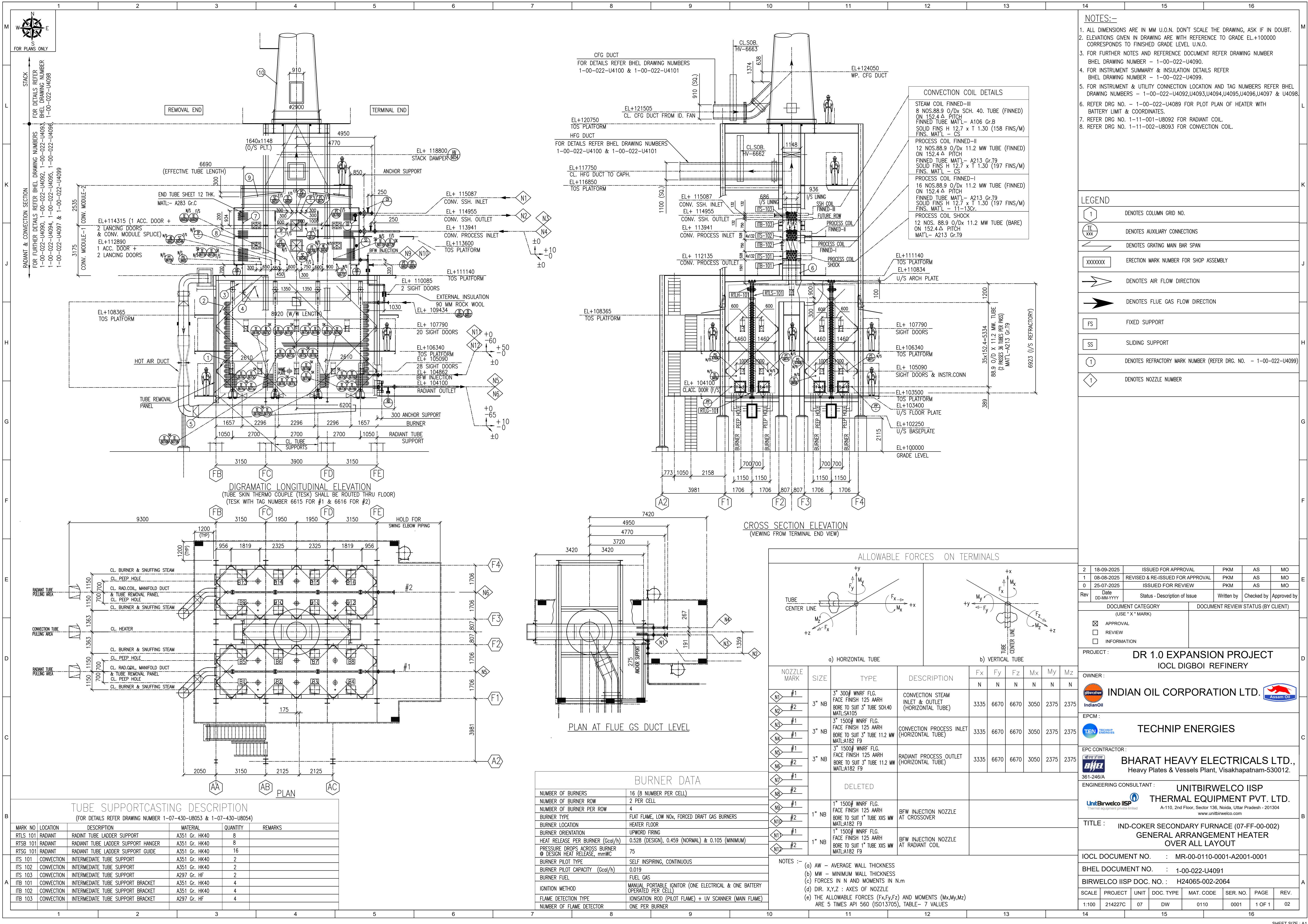
TITLE : HEATER P & ID
IND-COKER^{AT} SECONDARY FURNACE

EPCM DOCUMENT NO.	: MR-00-0110-0001-A0103-0009
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CONTRACTOR DOCUMENT NO.	: 1-00-056-U4113
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BIRWELCO IISP DOC. NO. : H24065-002-2020							
SCALE	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.	PAGE	REV.
1:1	214227C	07	DW	0110	0001	2 OF 2	1





- NOTES:-
1. ALL DIMENSIONS ARE IN MM U.O.N. DON'T SCALE THE DRAWING, ASK IF IN DOUBT.
 2. ELEVATIONS GIVEN IN DRAWING ARE WITH REFERENCE TO GRADE EL.+100000 CORRESPONDS TO FINISHED GRADE LEVEL U.O.N.
 3. FOR FURTHER NOTES AND REFERENCE DOCUMENT REFER DRAWING NUMBER BHEL DRAWING NUMBER - 1-00-022-U4090.
 4. FOR INSTRUMENT SUMMARY & INSULATION DETAILS REFER BHEL DRAWING NUMBER - 1-00-022-U4099.
 5. FOR INSTRUMENT & UTILITY CONNECTION LOCATION AND TAG NUMBERS REFER BHEL DRAWING NUMBERS - 1-00-022-U4092,U4093,U4094,U4095,U4096,U4097 & U4098.
 6. REFER DRG NO. - 1-00-022-U4089 FOR PLOT PLAN OF HEATER WITH BATTERY LIMIT & COORDINATES.
 7. REFER DRG NO. 1-11-001-U8092 FOR RADIANT COIL.
 8. REFER DRG NO. 1-11-002-U8093 FOR CONVECTION COIL.

- LEGEND
- 1 DENOTES COLUMN GRID NO.
 - TE xxx DENOTES AUXILIARY CONNECTIONS
 - XXXXXXX DENOTES GRATING MAIN BAR SPAN
 - XXXXXXX DENOTES ERECTION MARK NUMBER FOR SHOP ASSEMBLY
 - DENOTES AIR FLOW DIRECTION
 - DENOTES FLUE GAS FLOW DIRECTION
 - FS FIXED SUPPORT
 - SS SLIDING SUPPORT
 - 1 DENOTES REFRACTORY MARK NUMBER (REFER DRG. NO. - 1-00-022-U4099)
 - 1 DENOTES NOZZLE NUMBER

2	18-09-2025	ISSUED FOR APPROVAL	PKM	AS	MO
1	08-08-2025	REVISED & RE-ISSUED FOR APPROVAL	PKM	AS	MO
0	25-07-2025	ISSUED FOR REVIEW	PKM	AS	MO
Rev	Date	Status - Description of Issue	Written by	Checked by	Approved by
DOCUMENT CATEGORY			DOCUMENT REVIEW STATUS (BY CLIENT)		
(USE "X" MARK)					
☒ APPROVAL					
☐ REVIEW					
☐ INFORMATION					

PROJECT: DR 1.0 EXPANSION PROJECT
IOCL DIGBOI REFINERY

OWNER: INDIAN OIL CORPORATION LTD.

EPCM: TECHNIP ENERGIES

EPC CONTRACTOR: BHARAT HEAVY ELECTRICALS LTD.,
Heavy Plates & Vessels Plant, Visakhapatnam-530012.

ENGINEERING CONSULTANT: UNITBIRWELCO IISP
THERMAL EQUIPMENT PVT. LTD.
A-110, 2nd Floor, Sector 136, Noida, Uttar Pradesh - 201304
www.unitbirwelco.com

TITLE: IND-COKER SECONDARY FURNACE (07-FF-00-002)
GENERAL ARRANGEMENT HEATER
OVER ALL LAYOUT

IOCL DOCUMENT NO. : MR-00-0110-0001-A2001-0001

BHEL DOCUMENT NO. : 1-00-022-U4091

BIRWELCO IISP DOC. NO. : H24065-002-2064

SCALE	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.	PAGE	REV.
1:100	214227C	07	DW	0110	0001	1 OF 1	02

BURNER DATA	
NUMBER OF BURNERS	16 (8 NUMBER PER CELL)
NUMBER OF BURNER ROW	2 PER CELL
NUMBER OF BURNER PER ROW	4
BURNER TYPE	FLAT FLAME, LOW NOx, FORCED DRAFT GAS BURNERS
BURNER LOCATION	HEATER FLOOR
BURNER ORIENTATION	UPWARD FIRING
HEAT RELEASE PER BURNER (Gcal/h)	0.528 (DESIGN), 0.459 (NORMAL) & 0.105 (MINIMUM)
PRESSURE DROPS ACROSS BURNER @ DESIGN HEAT RELEASE, mmWC	75
BURNER PILOT TYPE	SELF INSPIRING, CONTINUOUS
BURNER PILOT CAPACITY (Gcal/h)	0.019
BURNER FUEL	FUEL GAS
IGNITION METHOD	MANUAL PORTABLE IGNITOR (ONE ELECTRICAL & ONE BATTERY OPERATED PER CELL)
FLAME DETECTION TYPE	IONISATION ROD (PILOT FLAME) + UV SCANNER (MAIN FLAME)
NUMBER OF FLAME DETECTOR	ONE PER BURNER

- NOTES :-
- AW - AVERAGE WALL THICKNESS
 - MW - MINIMUM WALL THICKNESS
 - FORCES IN N AND MOMENTS IN N.m
 - DIR. X,Y,Z : AXES OF NOZZLE
 - THE ALLOWABLE FORCES (Fx,Fy,Fz) AND MOMENTS (Mx,My,Mz) ARE 5 TIMES API 560 (ISO13705), TABLE - 7 VALUES

 INDIAN OIL CORPORATION LIMITED.  TECHNIP ENERGIES INDIA LIMITED	PROJECT TITLE DR 1.0 EXPANSION PROJECT
	TECHNIP ENERGIES REQUISITION NUMBER (To be filled)
	TECHNIP ENERGIES DOCUMENT NUMBER (To be filled)
	EQUIPMENT NUMBER (To be filled)
	VENDOR DOCUMENT NUMBER 4-DS-003-U1011
SIL METHODOLOGY	
	CODE STAMP

00	20.09.2025	ISSUED FOR ENGINEERING	AKS	AKS/UKK	YPK
Rev	Date DD-MM-YYYY	Revision Purpose	Written	Checked By	PM
DOCUMENT REVISIONS					

Sections changed in last revision are identified by a vertical line in the margin

Plant DR 1.0 EXPANSION PROJECT	Client IOCL, ASSAM REFINERY	Document ID 4-DS-003-U1010	Contract No. 8188
		SIL METHODOLOGY	Rev 00 Page 2 of 9

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2.	SCOPE OF WORK	
3.	DEFINITIONS AND ACRONYMS	3
4.	REFERENCE DOCUMENTS	3
5.	METHODOLOGY	4
5.1	SIL CLASSIFICATION TEAM	4
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5.4	RISK GRAPH AND GUIDELINES	5
5.4.1	RISK GRAPH	5
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Plant DR 1.0 EXPANSION PROJECT	Client IOCL, ASSAM REFINERY	Document ID 4-DS-003-U1010	Contract No. 8188
	SIL METHODOLOGY		
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SIL METHODOLOGY

1. INTRODUCTION

The SIL study will be done for the various units of refinery based on P&ID diagrams and Hazop study.

SIL classification is to identify the risk level of hazards protected by Safety Instrumented loop. The target SIL is outcome of a SIL classification.

SIL study will be carried out using Risk Graph methodology based on IEC61511 standard.

This document describes the methodology to be followed for carrying out SIL study for the Project.

2. SCOPE OF WORK

Technip Energies has been engaged by Indian Oil Corporation Ltd. (IOCL) as EPCM Consultant for its LSTK Package for DCU Heater for DR 1.0 expansion project at IOCL Digboi refinery Assam, India.

3. DEFINATIONS AND ACRONYMS

- SIL: Safety Integrity Level
- SIS: Safety Instrumented System
- SIF: Safety Instrumented Function
- IPL: Independent Protection Layer
- IE: Initiating Event
- PFD: Probability of Failure on demand

4. REFERENCE DOCUMENTS

- IEC 61508 Functional Safety of Electrical/Electronic/programmable electronic safety related systems
- IEC 61511 Functional Safety – Safety instrumented systems for the process industry sector

Plant DR 1.0 EXPANSION PROJECT	Client IOCL, ASSAM REFINERY	Document ID 4-DS-003-U1010	Contract No. 8188
	SIL METHODOLOGY		
			Rev 00 Page 4 of 9

5. METHODOLOGY

5.1 SIL Classification Team

- SIL Review Chairman
- Process Engineer
- Instrumentation Engineer
- Package Vendor Process Engineer (For Package Unit study)
- Scribe

5.2 Document required

- 5.2.1 P & IDS
- 5.2.2 Hazop report
- 5.2.3 Cause & effect diagram if available
- 5.2.4 Other related documents like control narratives, safety studies etc if prepared

5.3 Steps for SIL Study:

ExSientia Software from Exida will be used for carrying out the SIL study. Following steps will be performed during SIL study.

Step 1: Based on Hazop report, consequences for which instrumented interlock is identified / recommended as safeguard will be populated in exSILentia software.

Step 2: All initiating events causes of the consequences are identified from Hazop report and populated in exSILentia software. This is generally identified as "Cause" in Hazop report.

Step3: Select consequence severity level for Safety, Environment and asset. Refer attached table which is based on IEC 61511-3, Annexure D & E.

Step 4: Enter likelihood value of initiating causes. Below table shows typical initiating causes likelihoods. In case any initiated event is not part of the attached table then team can decide its frequency based on their experience.

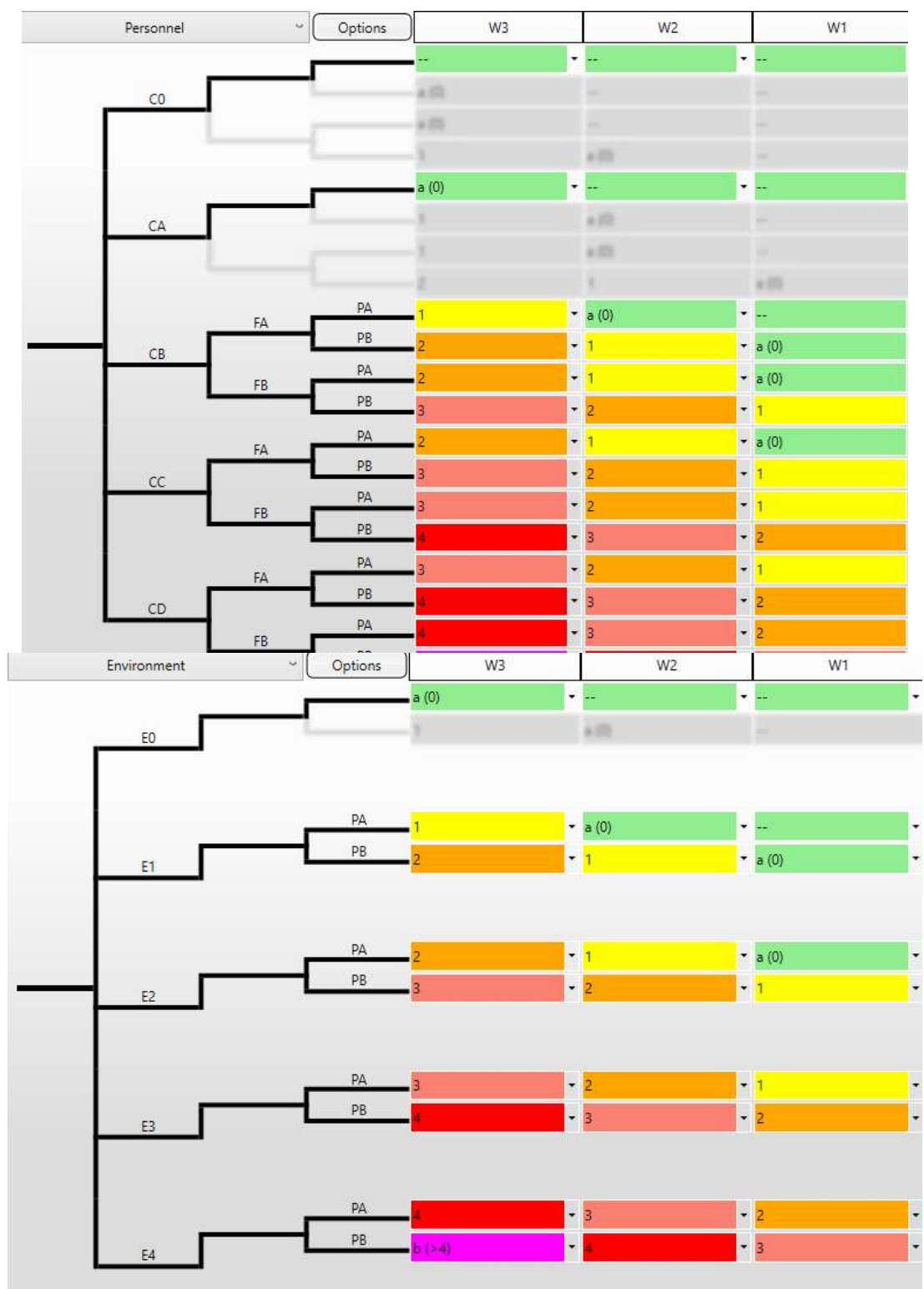
Step 5: Identify independent protection layer which will avert hazardous situation e.g. Safety valves. Required credit shall be taken based on PFD value of the protection device. It has to be ensured that IPL is independent with other protecting devices.

Step 7: Highest of three SIL (Safety, Environment & Asset) will be considered as Target SIL. SIF loop to designed as per Target SIL.

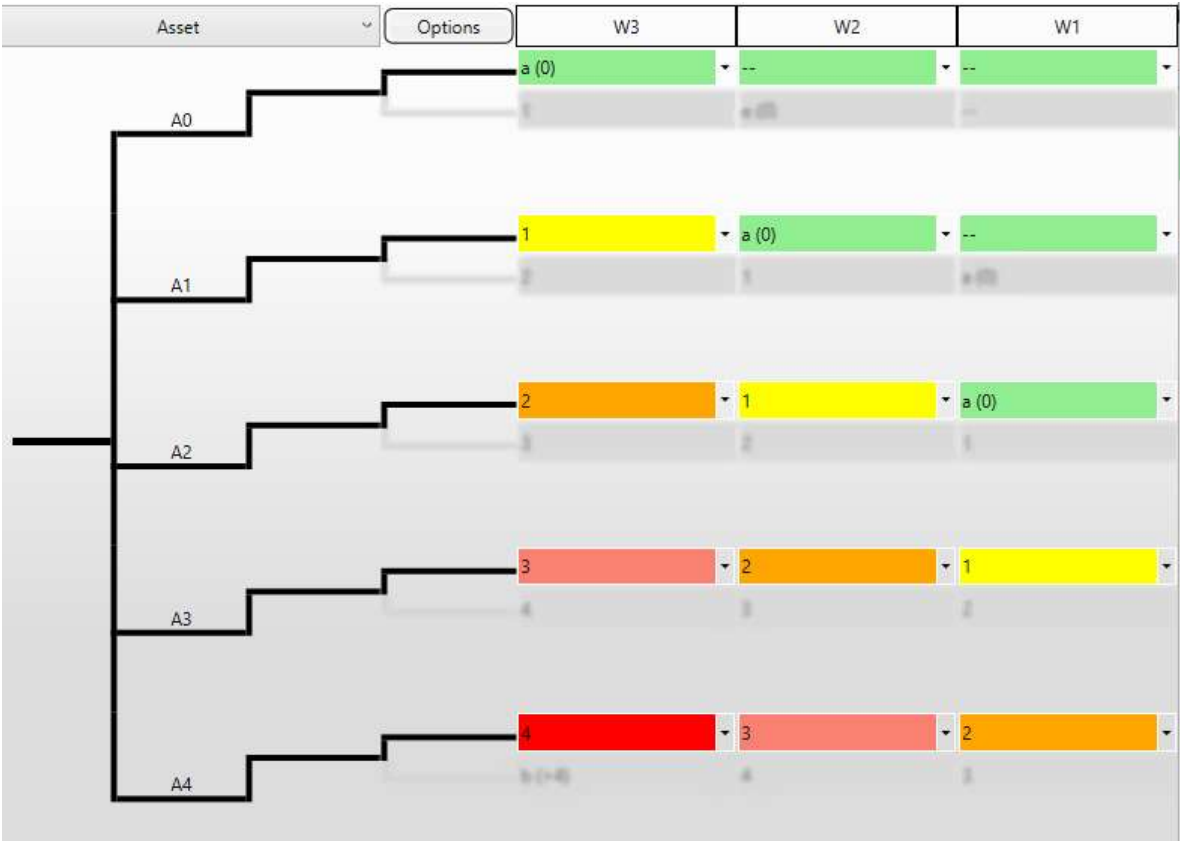
Plant DR 1.0 EXPANSION PROJECT	Client IOCL, ASSAM REFINERY	Document ID 4-DS-003-U1010	Contract No. 8188
			SIL METHODOLOGY
			Rev 00 Page 5 of 9

5.4 Risk Graph and guidelines

5.4.1 Risk Graph



Plant DR 1.0 EXPANSION PROJECT	Client IOCL, ASSAM REFINERY	Document ID 4-DS-003-U1010	Contract No. 8188
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Plant DR 1.0 EXPANSION PROJECT	Client IOCL, ASSAM REFINERY	Document ID 4-DS-003-U1010	Contract No. 8188				
बी एच ई एल BHEL इंडियन ऑयल IndianOil UnitBirwelco engineering worldwide T.EN TECHNIP ENERGIES	SIL METHODOLOGY						
			Rev	00	Page	7	of

5.4.2 The following definitions are specified for the various Risk Graph Parameters

Above is based on statistical historical data. SIL classification team shall decide for the credit to be taken for IPL based on individual SIF under discussion. Independence of IPL shall be ensured with respect to SIF under discussion and cause which put demand in SIF. Any other IPL credit may be taken based on decision by SIL study team.

Demand Rate		Consequence Category					
		Health and Safety		Environment		Assets (Economics)	
-	--	C0	No Impact	E0	No Effect	A0	No Effect
-	--	CA	Minor Injury	E1	Small, Uncontained Release	A1	Moderate \$100K to \$1M, 1- 5 days shutdown
W1	Very Low (10 to 100 years)	CB	Severe Injury/One Death	E2	Moderate Uncontained Release	A2	Major \$1M to \$6M, 5 - 15 days shutdown
W2	Low (1 to 10 years)	CC	Several Deaths	E3	Large Uncontained Release	A3	Extensive \$6M to \$12M, 15 - 30 days shutdown
W3	High (<1 year)	CD	Many Deaths/Catastrophe	E4	Extensive Uncontained Release	A4	Catastrophic >\$12M, > 30 days shutdown
Additional Parameters							
Presence in Danger Zone			Probability avert Hazard				
FA	Seldom to Frequently		PA	Under Certain Circumstances			
FB	Frequently to Continuously		PB	Almost Impossible			

Plant DR 1.0 EXPANSION PROJECT	Client IOCL, ASSAM REFINERY	Document ID 4-DS-003-U1010	Contract No. 8188
	SIL METHODOLOGY		
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5.4.3 Demand rate guidelines (W)

Initiating event	Demand Rate	Demand Frequency
Agitator motor failure	W1	Very low (10 to 100 Years)
Blower failure	W1	Very low (10 to 100 Years)
Centrifugal pump failure	W1	Very low (10 to 100 Years)
Heat exchanger tube leak	W1	Very low (10 to 100 Years)
Gasket/Packing failure	W1	Very low (10 to 100 Years)
Instrument air failure	W2	Low (1 to 10 years)
Control loop failure	W2	Low (1 to 10 Years)
Power supply failures	W2	Low (1 to 10 years)
Valve Failure	W2	Low (1 to 10 years)
Cooling water failure	W2	Low (1 to 10 years)
Loss of Nitrogen	W2	Low (1 to 10 years)
Blockage of line /flame arrestor chocking	W2	Low (1 to 10 years)
PHE failure	W2	Low (1 to 10 years)
Pump Failure loss of flow	W2	Low (1 to 10 years)
Positive displacement pump trip	W3	High (< 1 Year)
Centrifugal compressor trip	W3	High (< 1 Year)
Operator failure – Under stress	W3	High (< 1 Year)
Operator Failure –Unstressed	W2	Low (1 to 10 years)

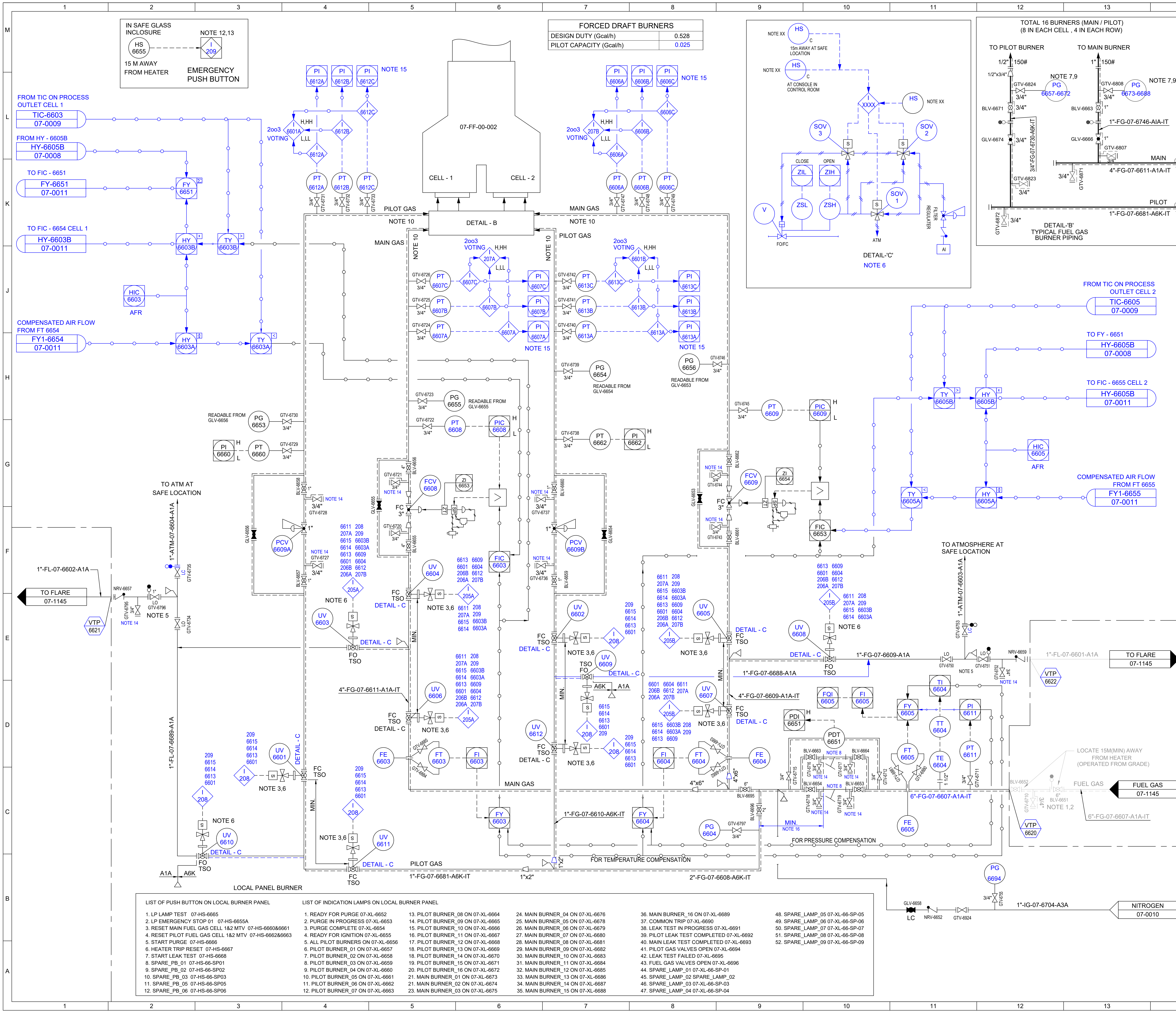
Above is based on statistical historical data. For causes other than above which put demand on safety function, SIL classification team to decide appropriately.

Plant DR 1.0 EXPANSION PROJECT	Client IOCL, ASSAM REFINERY	Document ID 4-DS-003-U1010	Contract No. 8188
	SIL METHODOLOGY		
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5.4.4 Guidelines for the credit of independent protection layer (IPL)

IPL	Credit for IPL
Dike	1×10^{-2}
Blast wall/Bunker	1×10^{-3}
Relief Valves	1×10^{-2}
Rupture Disk	1×10^{-2}
SIF – SIL1 - Independent	1×10^{-1}
SIF – SIL2 - Independent	1×10^{-2}
SIF – SIL3 - Independent	1×10^{-3}

Above is based on statistical historical data. SIL classification team shall decide for the credit to be taken for IPL based on individual SIF under discussion. Independence of IPL shall be ensured with respect to SIF under discussion and cause which put demand in SIF. Any other IPL credit may be taken based on decision by SIL study team.



GENERAL NOTES:

A. FOR STANDARD SYMBOLS DETAILS AND LEGEND SHEETS SEE DRAWINGS 07154C-0000-PID-0090-0010 . 1

B. ALL INSTRUMENT TAGS TO BE PREFIXED BY UNIT NUMBER 07.

C. FOR TRIP LOGIC, REFER TO CAUSE AND EFFECT CHART DOC. NO. MR-00-0110-0001-A3505-0002

NOTES:

1. THESE VALVES ARE LOCATED AT GRADE. 15M AWAY FROM FURNACE AND AT SAFE ACCESSIBLE LOCATION.

2. API - 553 TYPE "B" FIRE SAFE EBY.

4. I - 209 AN EMERGENCY PUSH BOTTOM IS PROVIDED AT MAIN CONTROL ROOM PRESSING WHICH FUEL TO FURNACE SHALL CUT OFF. IN ADDITION OF THIS A LOCAL EMERGENCY PUSH BUTTON (AT 15M AWAY FROM FURNACE) IS PROVIDED IN A BREAK GLASS ENCLOSURE.

5. FLARE LINE ISOLATION VALVE TO BE INSTALLED ONLY IN THE HORIZONTAL LINE WITH STEM IN DOWNWARD POSITION TO AVOID FREE FALL GATE & BLOCKAGE OF FLARE SYSTEM.

6. ALL SHUT DOWN VALVES AND LIMIT SWITCHES ARE PROVIDED WITH 2003 CONFIGURATION.

7. ONE NUMBER OF PRESSURE INSTRUMENT IS PROVIDED BEFORE FUEL SUPPLY CONNECTION TO EACH BURNER / PILOT.

8. STRAINER MESH SIZE SHALL BE LIMITED TO 200 MICRONS.

9. REFER P&ID DOC. NUMBER MR-00-0110-0001-A0103-0009 / SHT. 2 OF 2 FOR TAG DETAILS.

10. BURNER GAS PIPING DOWNSTREAM OF CONTROL VALVE SHALL BE HYDRAULICALLY SYMMETRICAL UP TO INDIVIDUAL BURNER.

11. TAPING OF EACH INDIVIDUAL MAIN / PILOT BURNER FUEL LINE SHALL BE FROM TOP OF THE HEADER PIPE.

12. ALL EMERGENCY PUSH BUTTON CONTAINS 2003 ELEMENT INSIDE IT.

13. THE VALVES THAT ARE 15M AWAY FROM THE HEATER WILL BE SUPPLIED LOOSE BY BHEL & INSTALLED BY CLIENT AT SITE.

14. ALL DRAIN OF THE FUEL SKID TO BE CONNECTED WITH COMMON HEADER & TERMINATED AT BATTERY LIMIT.

15. ALL ALARMS FOR TRIP SIGNAL GENERATED IN PLC AFTER 2003 VOTING SHALL BE ROUTED IN DCS.

16. PILOT HEADER SHALL BE CONNECTED DOWNSTREAM OF STRAINER AT MINIMUM DISTANCE AS POSSIBLE.

HOLDS:

1. CONTROL VALVE, ON-OFF VALVE , SELF ACTUATING VALVE SIZE SIZE.

REFERENCES

MR-00-0110-0001-A2001-0001 : GENERAL ARRANGEMENT DRAWING

214227C-00-JSD-1300-0002 : PIPING MATERIAL SPECIFICATION

6102-07-P&ID-2166 : P&ID PRE CRACKER & FLASHER SECTION

MR-00-0110-0001-A0103-0009 : HEATER P&ID

MR-00-0110-0001-A0103-0010 : UTILITY DISTRIBUTION P & ID

MR-00-0110-0001-A0103-0011 : HEATER APH P & ID

214227C-00-PID-0090 : LEGEND & SYMBOLS

1	16-09-2025	ISSUED FOR REVIEW	VN	NS	SB
0	19-08-2025	ISSUED FOR REVIEW	VN	NS	SB
Rev	Date	Status - Description of Issue	Written by	Checked by	Approved by
DOCUMENT CATEGORY			DOCUMENT REVIEW STATUS (BY CLIENT)		
☒ APPROVAL					
☐ REVIEW					
☐ INFORMATION					

PROJECT :

DR 1.0 EXPANSION PROJECT
IOCL DIGBOI REFINERY

OWNER :

INDIAN OIL CORPORATION LTD.

EPCM :

TECHNIP ENERGIES

EPC CONTRACTOR :

BHARAT HEAVY ELECTRICALS LTD.,
Heavy Plates & Vessels Plant, Visakhapatnam-530012.

ENGINEERING CONSULTANT :

UNITBIRWELCO IISP
THERMAL EQUIPMENT PVT. LTD.
A-110, 2nd Floor, Sector 136, Noida, Uttar Pradesh - 201304
www.unitbirwelco.com

TITLE :

FUEL GAS P & ID
IND-COKER^{AT} SECONDARY FURNACE

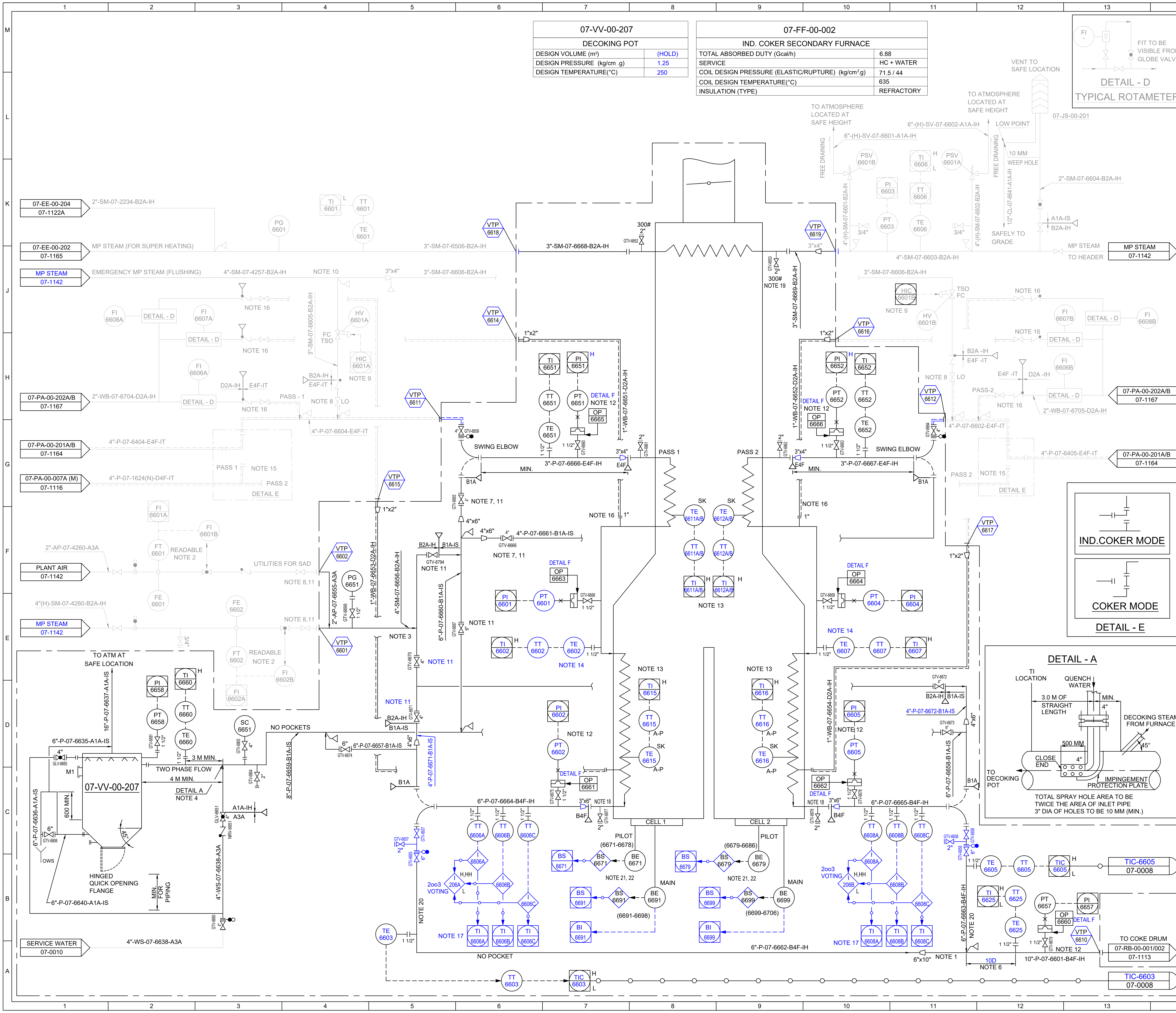
EPCM DOCUMENT NO. : MR-00-0110-0001-A0103-0008

CONTRACTOR DOCUMENT NO. : 1-00-056-U4105

BIRWELCO IISP DOC. NO. : H24065-002-2021

SCALE	PROJCT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.	PAGE	REV.
1:1	214227C	07	DW	0110	0001	1 OF 1	1

SHEET SIZE : A



GENERAL NOTES:

A. FOR STANDARD SYMBOLS DETAILS AND LEGEND SHEETS SEE DRAWINGS 077154C-0000-PID-0090-0010 . 1

B. ALL INSTRUMENT TAGS TO BE PREFIXED BY UNIT NUMBER 07.

C. FOR TRIP LOGIC, REFER TO CAUSE AND EFFECT CHART DOC. NO. MR-00-0110-0001-A3505-0002

NOTES:

1. LINE SUPPORT SHOULD BE SUITABLY DESIGNED TO HANDLE TWO PHASE / SLUG FLOW.

2. LOCAL FLOW INDICATOR ON COIL STEAM LINE SHOULD BE VISIBLE FROM GLOBE VALVE ON RESPECTIVE LINE.

3. STEAM TRAPS SHALL BE PROVIDED AT LOW POINTS.

4. QUENCH WATER INJECTION AND JOINING OF DECKING LATERALS WITH MAIN HEADER IS INDICATED IN DETAIL-A.

5. ALL THE INSTRUMENTATION AND SAFETY INTERLOCK ARE PROVIDED AS PER OISD 111, 118, 152 & OTHER APPLICABLE STANDARD.

6. ADEQUATE DISTANCE OF 10D IS MAINTAINED BETWEEN MIXING POINT AND TEMPERATURE INDICATOR AT THE COMMON COIL OUTLET AS A GOOD ENGINEERING PRACTICE AS PER OISD 111.

7. FLOW REVERSAL VALVE IN DECKING MANIFOLD SHALL BE LOCATED AT ONE PLACE FOR EASE OF OPERATION.

8. THESE VALVES TO BE LOCATED AT GRADE. 15M AWAY FROM FURNACE AND AT SAFE ACCESSIBLE LOCATION.

9. LOCATE SWITCH MIN 15 M AWAY FROM HEATER.

10. EMERGENCY STEAM LINE TO INDIVIDUAL HEATER PASSES SHALL BE SO ARRANGED SO THAT CONDENSATE CAN NOT DRAIN BACK TO COIL.

11. VALVES ON DECKING STEAM AND DECKING AIR LINES ARE SUITABLY LOCATED AT ONE PLACE FOR THE EASE OF OPERATION.

12. ALL INSTRUMENTS SHOWN WITH SYMBOL OP ARE OIL PURGE INSTRUMENTS.

13. PER PASS 14 NOS. TUBE SKIN THERMOCOUPLES (TSTC) IN RADIANT AND TWO IN BOTTOM MOST SHOCK ROW ARE PROVIDED.

TUBE NO.	NO. OF TST'S	LOCATION
LAST SIX TUBES PER PASS (IN THE DIRECTION OF FLOW)	2 PER TUBE	ONE AT EACH END AT APPROX. 2610 MM FROM RETURN BEND WELD
TWO MIDDLE TUBES	1 PER TUBE	MIDDLE OF THE TUBE

14. TEMPERATURE ELEMENT IS PROVIDED WITH ELBOLET TOWARDS FLOW DIRECTION.

15. ALTERNATIVE PROVISION FOR ROUTING HOT FEED FROM MF BOTTOM PUMP (07-PA-00-007) A/B (M) TO INDOCKER SECONDARY FURNACE IS PROVIDED FOR DCU MODE OPERATION AND SPOOL VALVE CONNECTION IS PROVIDED TO ACHIEVE THE SAME.

16. TURBULIZING WATER TO BE INJECTED AT THREE DIFFERENT LOCATIONS AS BELOW

1. CONVECTION INLET

2. CROSS OVER

3. 6TH TUBE FROM LAST

17. ALL ALARMS FOR TRIP SIGNAL GENERATED IN PLC AFTER 2003 VOTING SHALL BE ROUTED IN DCS.

18. HC SERVICE DRAIN LINE TO BE CONNECTED WITH COMMON HEADER AND TERMINATED AT BL.

19. SSH STEAM DRAIN TO BE CONNECTED WITH COMMON HEADER AND TERMINATED AT BL.

20. HEATER OUTLET PIPING OF PASS#1 & #2 TO BE HYDRAULICALLY SYMMETRICAL.

21. IONIZATION ROD FOR PILOT FLAME & UV SCANNER FOR MAIN FLAME ARE PROVIDED.

22. REFER P&ID DOC. NUMBER MR-00-0110-0001-A0103-0009 / SHT. 2 OF 2 FOR TAG DETAILS.

HOLDS:

1. DECKING POT SIZE.

REFERENCES

MR-00-0110-0001-A2001-0001 : GENERAL ARRANGEMENT DRAWING

214227C-00-JSD-1300-0002 : PIPING MATERIAL SPECIFICATION

6102-07-P&ID-2166 : P&ID PRE CRACKER & FLASHER SECTION

MR-00-0110-0001-A0103-0008 : FUEL GAS P&ID

MR-00-0110-0001-A0103-0010 : UTILITY DISTRIBUTION P & ID

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ENGINEERING CONSULTANT :
 UNITBIRWELCO IISP
THERMAL EQUIPMENT PVT. LTD.
A-110, 2nd Floor, Sector 136, Noida, Uttar Pradesh - 201304
www.unitbirwelco.com

TITLE : HEATER P & ID
IND-COKER^{AT} SECONDARY FURNACE

EPCM DOCUMENT NO. : MR-00-0110-0001-A0103-0009

CONTRACTOR DOCUMENT NO. : 1-00-056-U4106

BIRWELCO IISP DOC. NO. : H24065-002-2020

SCALE	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.	PAGE	REV.
1:1	214227C	07	DW	0110	0001	1 OF 2	1

07-VV-00-207

DECKING POT

DESIGN VOLUME (m³)	(HOLD)
DESIGN PRESSURE (kg/cm .g)	1.25
DESIGN TEMPERATURE(°C)	250

07-FF-00-002

IND. COKER SECONDARY FURNACE

TOTAL ABSORBED DUTY (Gcal/h)	6.88
SERVICE	HC + WATER
COIL DESIGN PRESSURE (ELASTIC/RUPTURE) (kg/cm².g)	71.5 / 44
COIL DESIGN TEMPERATURE(°C)	635
INSULATION (TYPE)	REFRACTORY

DETAIL - D

TYPICAL ROTAMETER

DETAIL - A

QUENCH WATER

3.0 M OF STRAIGHT LENGTH

500 MM

4"

DECKING STEAM FROM FURNACE

TO ATM AT SAFE LOCATION

TO DECKING POT

IMPINGEMENT PROTECTION PLATE

TOTAL SPRAY HOLE AREA TO BE TWICE THE AREA OF INLET PIPE

3" DIA OF HOLES TO BE 10 MM (MIN.)

IND. COKER MODE

COKER MODE

DETAIL - E

DETAIL - F

2003 VOTING

PILOT

MAIN

NO POCKET

NO POCKETS

DETAIL - G

DETAIL - H

DETAIL - I

DETAIL - J

DETAIL - K

DETAIL - L

DETAIL - M

DETAIL - N

DETAIL - O

DETAIL - P

DETAIL - Q

DETAIL - R

DETAIL - S

DETAIL - T

DETAIL - U

DETAIL - V

DETAIL - W

DETAIL - X

DETAIL - Y

DETAIL - Z

SHEET SIZE : A1

1	2		3		4		5		6		
RADIANT CELL 1 BURNERS	1	2	3	4	5	6	7	8			
PILOT IONIZATION ROD	BE-6671	BE-6672	BE-6673	BE-6674	BE-6675	BE-6676	BE-6677	BE-6678			
MAIN FLAME UV SCANNER	BE-6691	BE-6692	BE-6693	BE-6694	BE-6695	BE-6696	BE-6697	BE-6698			

RADIANT CELL 2 BURNERS	1	2	3	4	5	6	7	8
PILOT IONIZATION ROD	BE-6679	BE-6680	BE-6681	BE-6682	BE-6683	BE-6684	BE-6685	BE-6686
MAIN FLAME UV SCANNER	BE-6699	BE-6700	BE-6701	BE-6702	BE-6703	BE-6704	BE-6705	BE-6706

PILOT BURNER INLET PRESSURE INSTRUMENT								
CELL 1	PG-6657	PG-6658	PG-6659	PG-6660	PG-6661	PG-6662	PG-6663	PG-6664
CELL 2	PG-6665	PG-6666	PG-6667	PG-6668	PG-6669	PG-6670	PG-6671	PG-6672

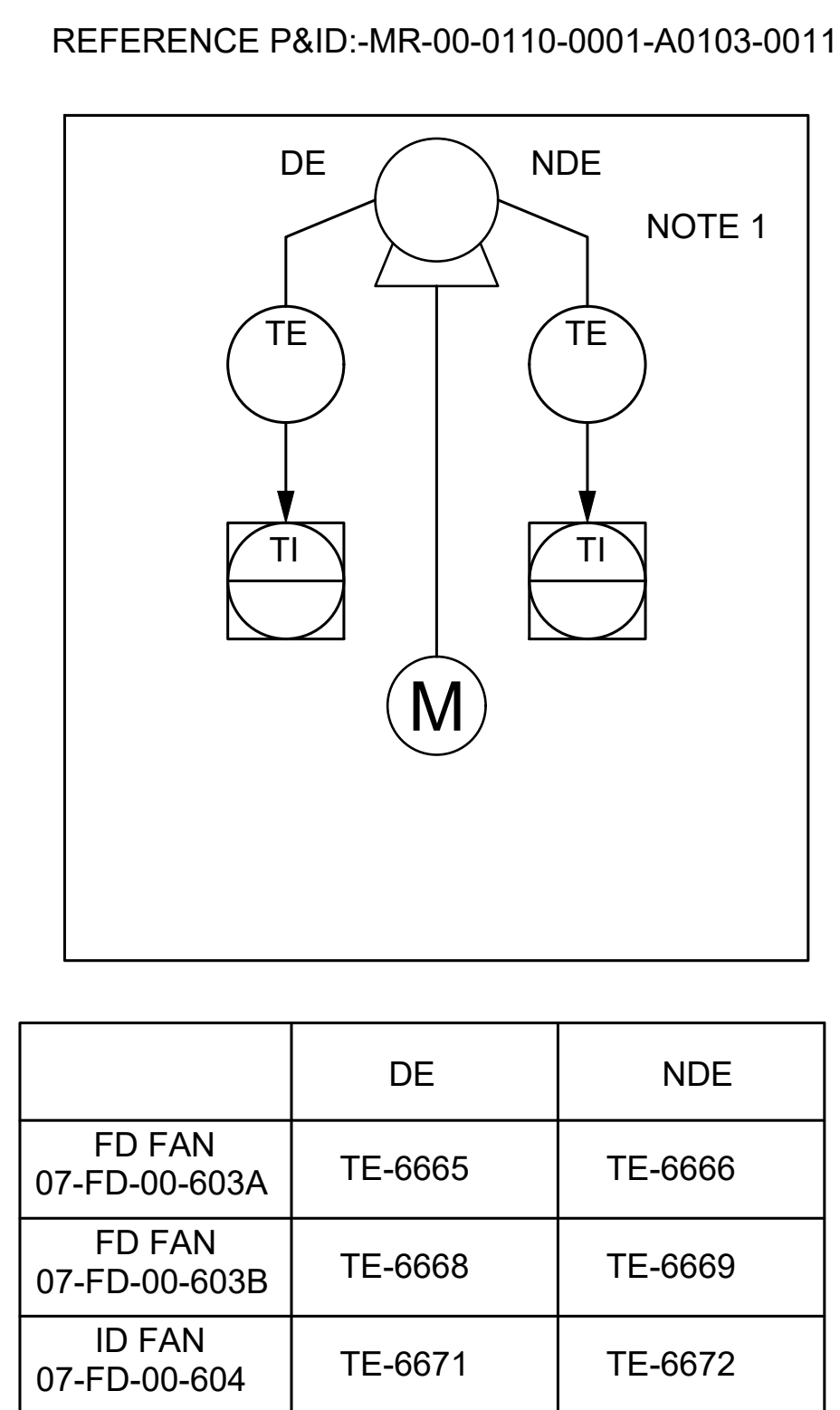
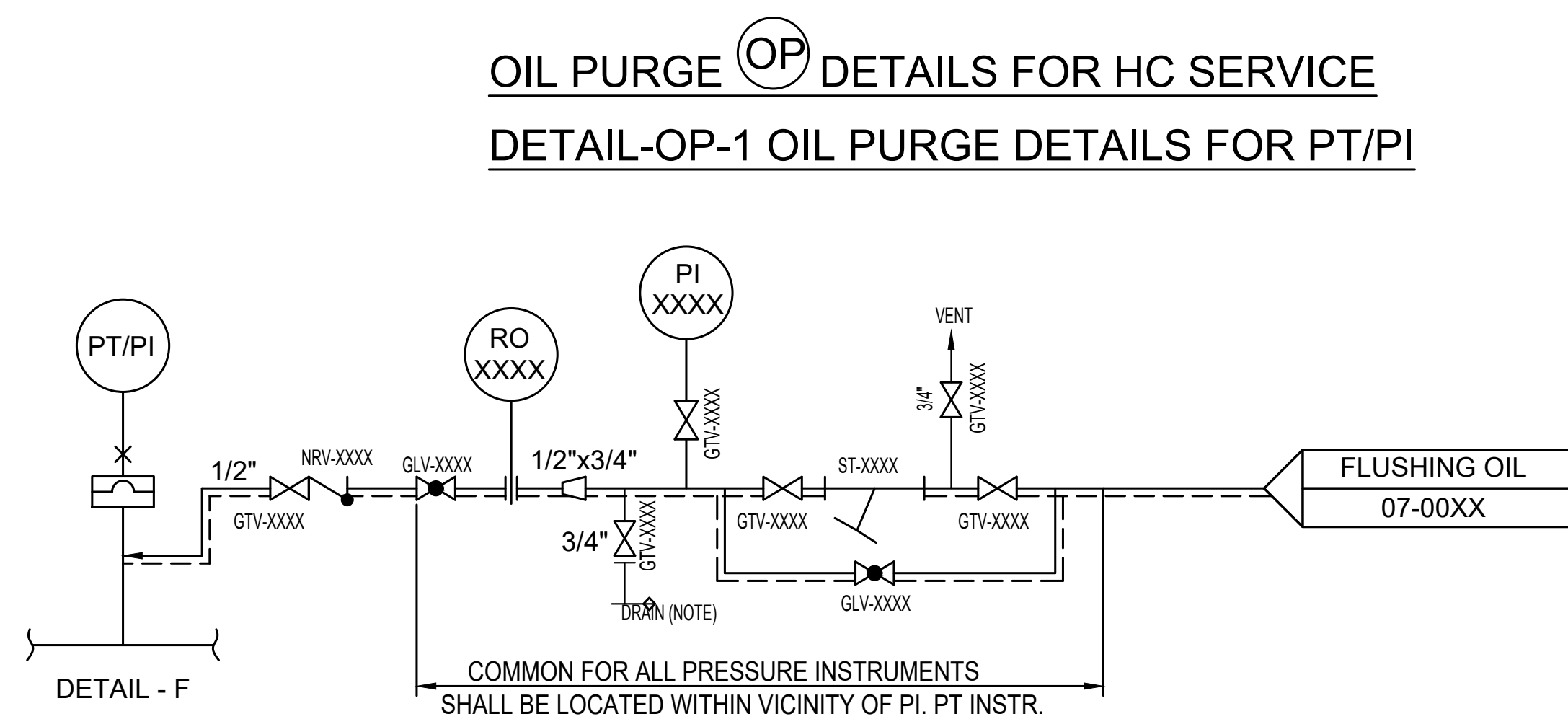
MAIN BURNER INLET PRESSURE INSTRUMENT								
CELL 1	PG-6673	PG-6674	PG-6675	PG-6676	PG-6677	PG-6678	PG-6679	PG-6680
CELL 2	PG-6681	PG-6682	PG-6683	PG-6684	PG-6685	PG-6686	PG-6687	PG-6688

HOT AIR DISTRIBUTION INLET PRESSURE INSTRUMENT								
CELL 1	PG-6711	PG-6712	PG-6713	PG-6714	PG-6715	PG-6716	PG-6717	PG-6718
CELL 2	PG-6719	PG-6720	PG-6721	PG-6722	PG-6723	PG-6724	PG-6725	PG-6726

RADIANT SECTION SKIN THERMOCOUPLE														
PASS 1	TE-6615A	TE-6615B	TE-6615C	TE-6615D	TE-6615E	TE-6615F	TE-6615G	TE-6615H	TE-6615J	TE-6615K	TE-6615L	TE-6615M	TE-6615N	TE-6615P
PASS 2	TE-6616A	TE-6616B	TE-6616C	TE-6616D	TE-6616E	TE-6616F	TE-6616G	TE-6616H	TE-6616J	TE-6616K	TE-6616L	TE-6616M	TE-6616N	TE-6616P

BURNER INLET LINE VALVES								
S.NO.	1	2	3	4	5	6	7	8
CELL 1 MAIN BURNER	GTV- 6807	GTV- 6809	GTV- 6811	GTV- 6813	GTV- 6815	GTV- 6817	GTV- 6819	GTV- 6821
	GTV- 6808	GTV- 6810	GTV- 6812	GTV- 6814	GTV- 6816	GTV- 6818	GTV- 6820	GTV- 6822
	BLV-6663	BLV-6664	BLV-6665	BLV-6666	BLV-6667	BLV-6668	BLV-6669	BLV-6670
	GLV-6666	GLV-6667	GLV-6668	GLV-6669	GLV-6670	GLV-6671	GLV-6672	GLV-6673
CELL 1 PILOT BURNER	GTV- 6823	GTV- 6825	GTV- 6827	GTV- 6829	GTV- 6831	GTV- 6833	GTV- 6835	GTV- 6837
	GTV- 6824	GTV- 6826	GTV- 6828	GTV- 6830	GTV- 6832	GTV- 6834	GTV- 6836	GTV- 6838
	BLV-6671	BLV-6672	BLV-6673	BLV-6674	BLV-6675	BLV-6676	BLV-6677	BLV-6678
	GLV-6674	GLV-6675	GLV-6676	GLV-6677	GLV-6678	GLV-6679	GLV-6680	GLV-6681

BURNER INLET LINE VALVES								
S.NO.	1	2	3	4	5	6	7	8
CELL 2 MAIN BURNER	GTV- 6839	GTV- 6841	GTV- 6843	GTV- 6845	GTV- 6847	GTV- 6849	GTV- 6851	GTV- 6853
	GTV- 6840	GTV- 6842	GTV- 6844	GTV- 6846	GTV- 6848	GTV- 6850	GTV- 6852	GTV- 6854
	BLV-6679	BLV-6680	BLV-6681	BLV-6682	BLV-6683	BLV-6684	BLV-6685	BLV-6686
	GLV-6682	GLV-6683	GLV-6684	GLV-6685	GLV-6686	GLV-6687	GLV-6688	GLV-6689
CELL 2 PILOT BURNER	GTV- 6855	GTV- 6857	GTV- 6859	GTV- 6861	GTV- 6863	GTV- 6865	GTV- 6867	GTV- 6869
	GTV- 6856	GTV- 6858	GTV- 6860	GTV- 6862	GTV- 6864	GTV- 6866	GTV- 6868	GTV- 6870
	BLV-6687	BLV-6688	BLV-6689	BLV-6690	BLV-6691	BLV-6692	BLV-6693	BLV-6694
	GLV-6690	GLV-6691	GLV-6692	GLV-6693	GLV-6694	GLV-6695	GLV-6696	GLV-6697



PILOT BURNER INDIVIDUAL LINE NUMBER								
CELL 1	3/4"-FG-07-6730-A6K-IT	3/4"-FG-07-6731-A6K-IT	3/4"-FG-07-6732-A6K-IT	3/4"-FG-07-6733-A6K-IT	3/4"-FG-07-6734-A6K-IT	3/4"-FG-07-6735-A6K-IT	3/4"-FG-07-6736-A6K-IT	3/4"-FG-07-6737-A6K-IT
CELL 2	3/4"-FG-07-6738-A6K-IT	3/4"-FG-07-6739-A6K-IT	3/4"-FG-07-6740-A6K-IT	3/4"-FG-07-6741-A6K-IT	3/4"-FG-07-6742-A6K-IT	3/4"-FG-07-6743-A6K-IT	3/4"-FG-07-6744-A6K-IT	3/4"-FG-07-6745-A6K-IT

MAIN BURNER INDIVIDUAL LINE NUMBER								
CELL 1	1"-FG-07-6746-A1A-IT	1"-FG-07-6747-A1A-IT	1"-FG-07-6748-A1A-IT	1"-FG-07-6749-A1A-IT	1"-FG-07-6750-A1A-IT	1"-FG-07-6751-A1A-IT	1"-FG-07-6752-A1A-IT	1"-FG-07-6753-A1A-IT
CELL 2	1"-FG-07-6754-A1A-IT	1"-FG-07-6755-A1A-IT	1"-FG-07-6756-A1A-IT	1"-FG-07-6757-A1A-IT	1"-FG-07-6758-A1A-IT	1"-FG-07-6759-A1A-IT	1"-FG-07-6760-A1A-IT	1"-FG-07-6761-A1A-IT

MAIN BURNERS TAG NUMBER								
CELL 1	07-FB-00-625	07-FB-00-626	07-FB-00-627	07-FB-00-628	07-FB-00-629	07-FB-00-630	07-FB-00-631	07-FB-00-632
CELL 2	07-FB-00-633	07-FB-00-634	07-FB-00-635	07-FB-00-636	07-FB-00-637	07-FB-00-638	07-FB-00-639	07-FB-00-640

PILOT BURNERS TAG NUMBER								
CELL 1	07-FB-00-641	07-FB-00-642	07-FB-00-643	07-FB-00-644	07-FB-00-645	07-FB-00-646	07-FB-00-647	07-FB-00-648
CELL 2	07-FB-00-649	07-FB-00-650	07-FB-00-651	07-FB-00-652	07-FB-00-653	07-FB-00-654	07-FB-00-655	07-FB-00-656

GENERAL NOTES:

- A. FOR STANDARD SYMBOLS DETAILS AND LEGEND SHEETS SEE DRAWINGS 077154C-0000-PID-0090-0010_1
- B. ALL INSTRUMENT TAGS TO BE PREFIXED BY UNIT NUMBER 07.
- C. FOR TRIP LOGIC, REFER TO CAUSE AND EFFECT CHART DOC. NO. MR-00-0110-0001-A3505-0002

NOTES:

- 1. ONE TEMPERATURE ELEMENT PER BEARING FOR ID & FD FANS ARE PROVIDED.

1	16-09-2025	ISSUED FOR REVIEW	VN	NS	SB
0	19-08-2025	ISSUED FOR REVIEW	VN	NS	SB
Rev	Date DD-MM-YYYY	Status - Description of Issue	Written by	Checked by	Approved by
DOCUMENT CATEGORY			DOCUMENT REVIEW STATUS (BY CLIENT)		
(USE "X" MARK)					
☒ APPROVAL ☐ REVIEW ☐ INFORMATION					

PROJECT :	DR 1.0 EXPANSION PROJECT IOCL DIGBOI REFINERY
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OWNER :



INDIAN OIL CORPORATION LTD.



EPCM :  **TECHNIP ENERGIES**

EPC CONTRACTOR :



BHARAT HEAVY ELECTRICALS LTD.,
Heavy Plates & Vessels Plant, Visakhapatnam-530012.

361-246/A

ENGINEERING CONSULTANT : **UNITBIRWELCO IISP**
THERMAL EQUIPMENT PVT. LTD.
 UnitBirwelco IISP
 Thermal equipment private limited
 A-110, 2nd Floor, Sector 136, Noida, Uttar Pradesh - 201304
www.unitbirwelco.com

TITLE :	HEATER P & ID IND-COKER ^{AT} SECONDARY FURNACE
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EPCM DOCUMENT NO. : MR-00-0110-0001-A0103-0009

CONTRACTOR DOCUMENT NO. : 1-00-056-U4113

BIRWELCO IISP DOC. NO. : H24065-002-2020

SCALE	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.	PAGE	REV.
1:1	214227C	07	DW	0110	0001	2 OF 2	1



EFFECTS

REV. NO.